

# THE SEAL MAN'S O-RING HANDBOOK™

- **13 O-Ring Materials**
- **Over 4,000 Sizes Listed**
- **Complete Design Information**
- **Every Metric & Inch Size O-Ring**
- **2,073 Fluid Compatability Listings**



**EPM, INC.**  
*The Seal Man™*





## The Seal Man's O-Ring Handbook™

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# 47 Billion Seals in Stock!\*

**\* Actually, that's not true....it's closer to 156 Billion....and we don't really stock them, but - we can make any inch size up to nearly 60 inches outside or any metric size up to 1500 MM seal in a hurry!**

**OIL SEALS (SC,TC,SB & TB)**  
RUBBER O.D.  
WITH METAL  
MOLDED IN  
TO 30" / 760MM



**VEE PACKING**  
URETHANE,  
FAB-RUBBER  
OR TEFLON  
TO 60" / 1500MM



**OIL SEALS (1 OR 2 LIPS)**  
RUBBER O.D.  
WITH ALUMINUM  
INSERT - TWO PC  
TO 60" / 1500MM



**U-CUPS (SKY, UN, UHS, DIN)**  
URETHANE,  
RUBBER  
OR TEFLON  
TO 60" / 1500MM



**OIL SEALS (CAN BE SPLIT)**  
SOLID - ONE PC  
NBR, VITON OR  
TEFLON  
TO 22" / 550MM



**O-RINGS & B/U'S**  
JAPANESE (G & P)  
EUROPEAN (DIN)  
METRIC O-RINGS  
TO 60" / 1500MM



**OIL SEALS (1 OR 2 LIPS)**  
METAL O.D.  
WITH NBR OR  
VITON LIP  
TO 72" / 1800MM



**GASKETS (CUSTOM SHAPES)**  
NON-ASBESTOS,  
TEFLON, VITON,  
OR ANY MAT'L  
TO 144" / 3600MM



**V-RINGS (ROTARY TYPE)**  
NITRILE, VITON  
EPDM, SILICONE  
A, S & E SERIES  
TO 60" / 1500MM



**SEAL KITS**  
COMPLETE  
WITH ALL  
SEALS NEEDED  
TO 60" / 1500MM



**PUMP PACKINGS**  
NON-ASBESTOS,  
FLEX GRAPHITE,  
OR TEFLON  
TO 1-1/2" / 40MM



**PUMP SEALS**  
NITRILE OR VITON  
WITH CARBON,  
CERAMIC & S/S  
TO 3" / 75MM



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"On a scale of 1 to 10, I rate EPM a 10. These guys are GOOD! They have very friendly and experienced inside sales people. I can recommend you call EPM when you need seals ... especially odd ball, hard-to-find and METRICS!"

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## Who is The Seal Man™?

### Introducing, Mr. Jerry Whitlock, The Seal Man™

There is an old marketing strategy which says, "become known by that which your customers call you." Over 30 years ago, the customers of Jerry Whitlock began to call him "The Seal Man" because they realized that he was one of the most knowledgeable seal and gasket specialists in the entire world. Jerry's experience has carried him around the world as a sought after business man, consultant, advisor, lecturer, training instructor and on-sight trouble shooter. The Seal Man's specialties include solutions for high pressure and high temperature sealing applications; large diameter seals and packings; rotating and reciprocating equipment sealing applications specialist; oil seals and any joint gasketing problem solving. To quote Jerry Whitlock - "There is NO international standard or special seal that we cannot provide - NONE. I can guarantee you, if I cannot supply you the seal or gasket you need, it probably does not exist."



### Jerry Whitlock:

- acts as a consultant to international seal and gasket firms.
- is available to companies outside the U.S. who need assistance establishing seal and gasket or industrial business in the U.S.
- has market studies available for the U.S. seal and gasket market.
- is a specialist in Internet marketing.
- has traveled extensively.

**Mr. Whitlock is available for interviews for TV, radio, newspaper, and magazine.**

### Subjects of specialty:

- Cyber Executive
- Internet Marketing
- E-Commerce / Electronic Commerce
- Industrial Marketing
- Marketing
- Business Management
- Import / Export
- Seals & Gasket Marketing
- International Business
- Industrial Distribution in the U.S.
- Largemouth Bass Fishing
- Lake Oconee, GA
- Hybrid Bass Fishing

## What Is An O-Ring?

### O-Ring Description

An O-Ring is a torus, or doughnut-shaped object, generally made from an elastomer. O-Rings can also be made in PTFE and other plastic materials, and in metals, both hollow and solid. They are used primarily for sealing. Another use is for light duty drive belts.

### Basic Principles

An O-Ring seal is a means for closing off a passageway preventing an unwanted escape or loss of fluid. The seal consists of an O-Ring installed in a gland and is exactly that - a circular run in which the elastomeric material has a section that is virtually circle. The gland is the cavity (usually within metal) into which the O-Ring is placed. The combination of these two elements comprises an O-Ring seal.

### Use

O-Rings are used in two general design applications: static (non-moving) and dynamic (moving). Static applications may range from vacuum to over 60,000 psi for sealing flanges and O-Ring grooves. O-Ring seals with lobed cross sections were designed for both static and dynamic applications. The four and six lobed configurations resist spiral failure and also extrusion failure in applications with large clearance between parts. Of the some 20 different types of O-Ring seals available, the common round cross section O-Ring type is the most versatile. The conventional type of O-Ring may be used in almost any application if the gland to contain the seal is deisgned correctly and the right size and material is chosen.



### Operation

All fluid-tight seals are characterized by the absence of any passage by which fluid might escape. Detail differences exist in the manner by which zero clearance is obtained - welding, brazing, soldering, ground or lapped fits or the yielding of a softer material wholly or partially confined between two harder and stiffer members of the structure. The O-Ring seal falls in the latter class. The rubber seal should be considered as an incompressible, viscous fluid having a very high surface tension. Now, whether by mechanical perssure from the surrounding structure or whether by pressure transmitted through hydraulic fluid, this extremely viscous fluid (the elastomeric O-Ring) is forced to flow in the gland to produce zero clearance or a positive block to the flow of the less viscous fluid being sealed. The rubber absorbs the stack-up of tolerances of the unit and its memory maintains a sealed condition.



**Before Installation**



**After Installation**



**With System Pressure**

## How To Achieve Optimum Performance of An O-Ring

The successful use of O-Rings depends upon many factors:

- A. Surface Finish** - All metal surfaces over which the O-Ring moves should be held to a maximum finish of 16 RMS, although the groove finish can have a maximum of 32 RMS. There should be no nicks, burrs, or scratches.
- B. Metals** - All metals over which an O-Ring moves should have a hard surface such as steel, nickel-plated, or chrome-plated. Special attention should be given if you select soft metals such as aluminum, brass, or bronze.
- C. Excessive Metal Clearance** - Clearances should be held to the recommended maximum diametrical tolerance. Consideration must be given to the breathing of cylinder in your calculations - which is the possibility of the cylinder bore to expand or balloon out at its center.
- D. Concentricity** - It is important to hold eccentricity within the recommended practice and to design for sufficient bearing area to take care of side loads or off center loading.
- E. Cleanliness** - All systems should be kept clean and free from dirt, grit, chips, and any foreign materials. Any type of abrasive material will cut the O-Ring. When replacing a failed O-Ring, look for tiny metal chips embedded into the O-Ring, which could mean a pump problem.
- F. Squeeze (preload)** - For good sealing, the minimum diametrical squeeze should be observed. Where pressures are low and friction is critical, the amount of squeeze can be decreased but caution should be exercised.
- G. Lubrication** - When used in pneumatic systems, O-Rings should be lubricated. If permitted to run dry, then they will face abrasion and twisting.
- H. Groove Design** - Proper design is a most essential factor in the successful operation of O-Rings. The rectangular shaped groove is recommended except for special applications.



## O-Ring Characteristics

An early and prominent user of O-Rings cites characteristics of O-Ring seals of interest to designers. <sup>1</sup>The more general characteristics are:

- A.** The seals can be made perfectly leak-proof for cases of static pistons and cylinders for fluid pressures up to 5,000 psi (limit of test pressure). The pressure may be constant or variable.
- B.** The seals can be made to seal satisfactorily between reciprocating pistons and cylinders at any fluid pressure up to 5,000 psi. There may be slight running leakage (a few drops per hundred strokes) depending on the film forming ability of the hydraulic medium. O-Rings can be used between rotating members with similar results but in all cases the surface rubbing speed must be kept low.
- C.** A single O-Ring will seal with pressure applied alternately on one side and then on the other side. However, in cases of severe loading or usage under necessarily unfavorable conditions, seal life can be extended by designing the mechanism so that each seal is subjected to pressure in one direction only. Seals may be arranged in series as a safety measure, but the first seal exposed to pressure will take full load.
- D.** O-Ring seals must be radially compressed between the bottom of the seal groove and the cylinder wall for proper sealing action. This compression may cause the seal to roll slightly in its groove under certain conditions of piston motion, but the rolling action is not necessary for normal operation of the seals.
- E.** In either static or moving applications, when the O-Ring seal is under high pressure the primary cause of seal failure is extrusion of the seal material into the piston-cylinder clearance. The major factors affecting extrusion are fluid pressure, seal hardness and strength, and piston-cylinder clearance.
- F.** Moving seals may fail by abrasion against the cylinder or piston walls. Therefore, the contacting surfaces should be suitably finished for long seal life. Moving seals that pass over ports or surface irregularities, while under hydraulic pressure, are very quickly cut or worn to failure.



<sup>1</sup> Excerpt taken from: "O-Ring Seals in the Design of Hydraulic Mechanisms" A paper presented at the S.A.A. Annual Meeting, January 1947 by Mr. D.R. Pearl of Ha., Std. Prop. Div. of United Aircraft Corp.



## O-Ring Limitations

Although it has been stated that O-Rings offer a reasonable approach to the ideal hydraulic seal, they should not be considered the immediate solution to all sealing problems. It has been brought out in the forgoing discussion that there are certain definite limitations on their use, for example, high temperature, high rubbing speeds, cylinder ports over which seals must pass, and large clearances. Disregard for these limitations will result in poor seal performance. Piston rings, lip type seals, lapped fits, flat gaskets and pipe fitting all have their special places in hydraulic design, but where the design specifications permit the proper use of O-Rings, they will be found to give long and dependable service.<sup>2</sup>

While no claim is made that an O-Ring will serve best in all conditions, it merits consideration for most seal applications except:

- A.** Rotary speeds exceeding 1,500 feet per minute
- B.** An environment completely incompatible with any elastomeric material.
- C.** Just plain insufficient structure (for anything but a flat gasket).

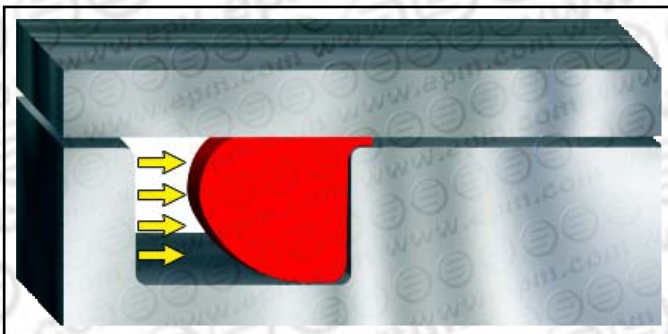
## O-Ring Life Cycle



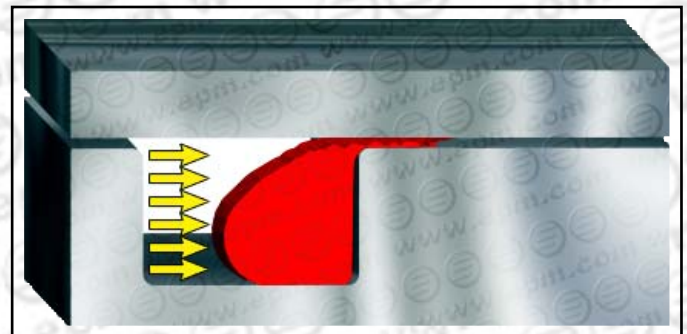
**1. Installation of O-Ring**



**2. Pressure Applied to O-Ring (Ideal)**



**3. Extrusion of O-Ring**



**4. Failure of O-Ring**

<sup>2</sup>"O-Ring Seals in the Design of Hydraulic Mechanisms" A paper presented at the S.A.A. Annual Meeting, January, 1947 by Mr. D.R. Pearl of Ha., Std. Prop. Div. of United Aircraft Corp.

# Major Dynamic Sealing Problems

## FRICITION

Friction is the rubbing force or resistance to motion between two surfaces that are touching each other.

Example: Seal material touching metal.

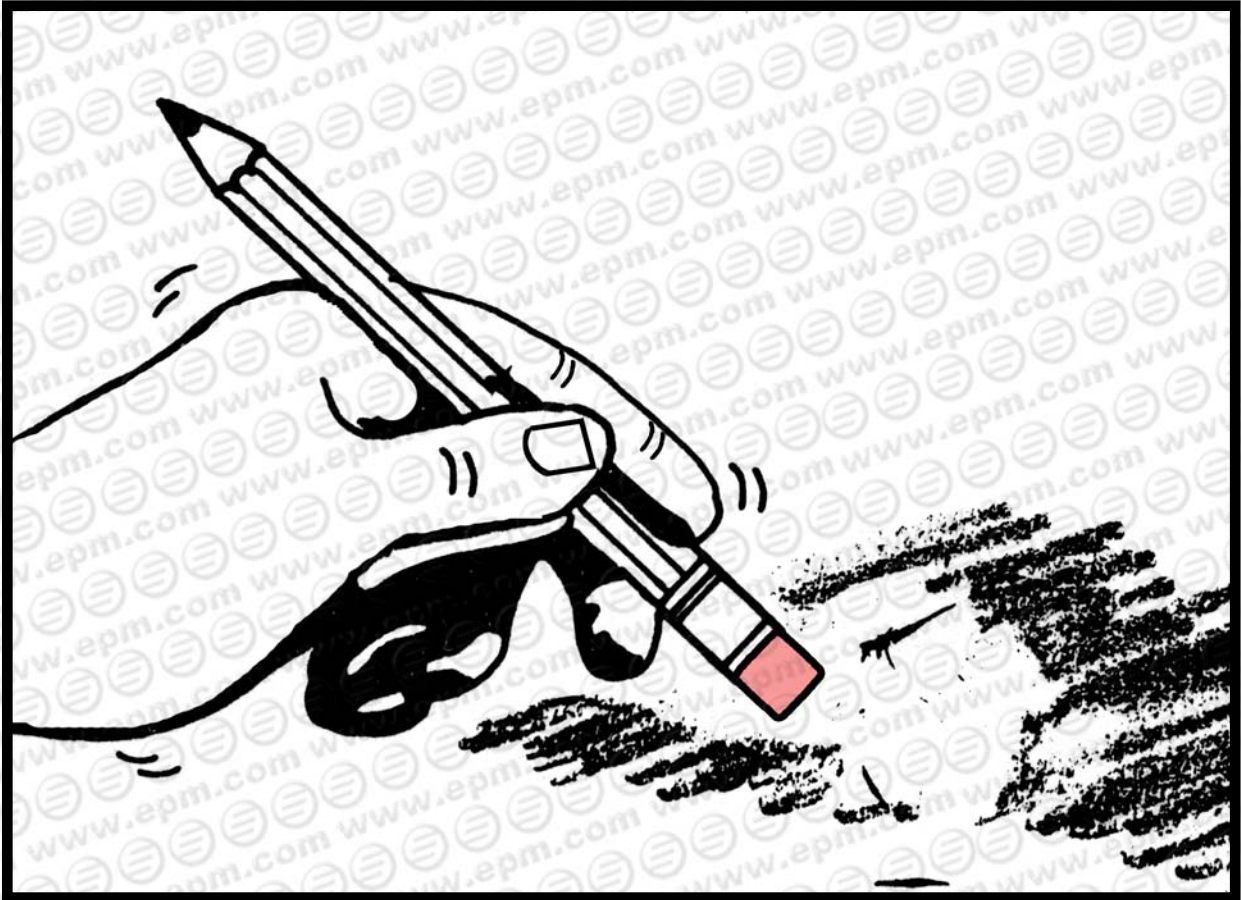
| Variable                                    | To Reduce Friction                                                                                                                                                                                                            |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A. Fluid pressure on seal                   | Reduce pressure (seldom practical).                                                                                                                                                                                           |
| B. Surface Finish                           | Smooth to $2\mu - 4\mu$ (10 microinches) RMS maximum.                                                                                                                                                                         |
| C. Seal material hardness                   | Select softer material for squeeze seals; usually select a harder material for lip seals.                                                                                                                                     |
| D. Seal material temperature                | Cool the fluid and seal; if this is not possible, use smaller seal cross-section or larger groove to reduce hot squeeze.                                                                                                      |
| E. Contact area between metal and seal      | Reduce width of contact line of lip-type seal; increase width of line of squeeze-type seals (low pressure applications).                                                                                                      |
| F. Lubricity of fluid                       | Select higher-lubricity fluid.                                                                                                                                                                                                |
| G. Coefficient of friction of seal material | Use low-coefficient compound if system must run dry; check dry lubricant additives and/or fiber reinforcement for retention of limited lubricant (if well lubricated, coefficient of dry seal compound has little relevance). |

| Variable                                          | To Reduce Friction                                                                                              |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| H. Shape of surface irregularities                | No sharp angles; shallower angle to surface (seldom practical).                                                 |
| I. Fluid entrapment between seal and metal        | Experiment with higher-viscosity fluid, lower contact force, lip shape, fiber reinforcement for lube "wicking." |
| J. Orientation of surface irregularities          | Hone linearly for axial orientation of tool marks (seldom practical due to increased leakage).                  |
| K. Time-at-rest between seal and metal            | Reduce time between movements.                                                                                  |
| L. Speed of surface motion                        | Increase speed; this will increase hydroplaning and related leakage.                                            |
| M. Compression forces on seal                     | Reduce squeeze on seal; avoid putting squeeze on heel of seals.                                                 |
| N. Direction of motion                            | Select seal shape less prone to wedging in critical direction.                                                  |
| O. Extrusion of seal into clearance gap (jamming) | Reduce clearance gap; use anti-extrusion device and/or extrusion resistant seal.                                |

## Major Dynamic Sealing Problems

# WEAR

Wear - to diminish gradually by friction and rubbing motion.

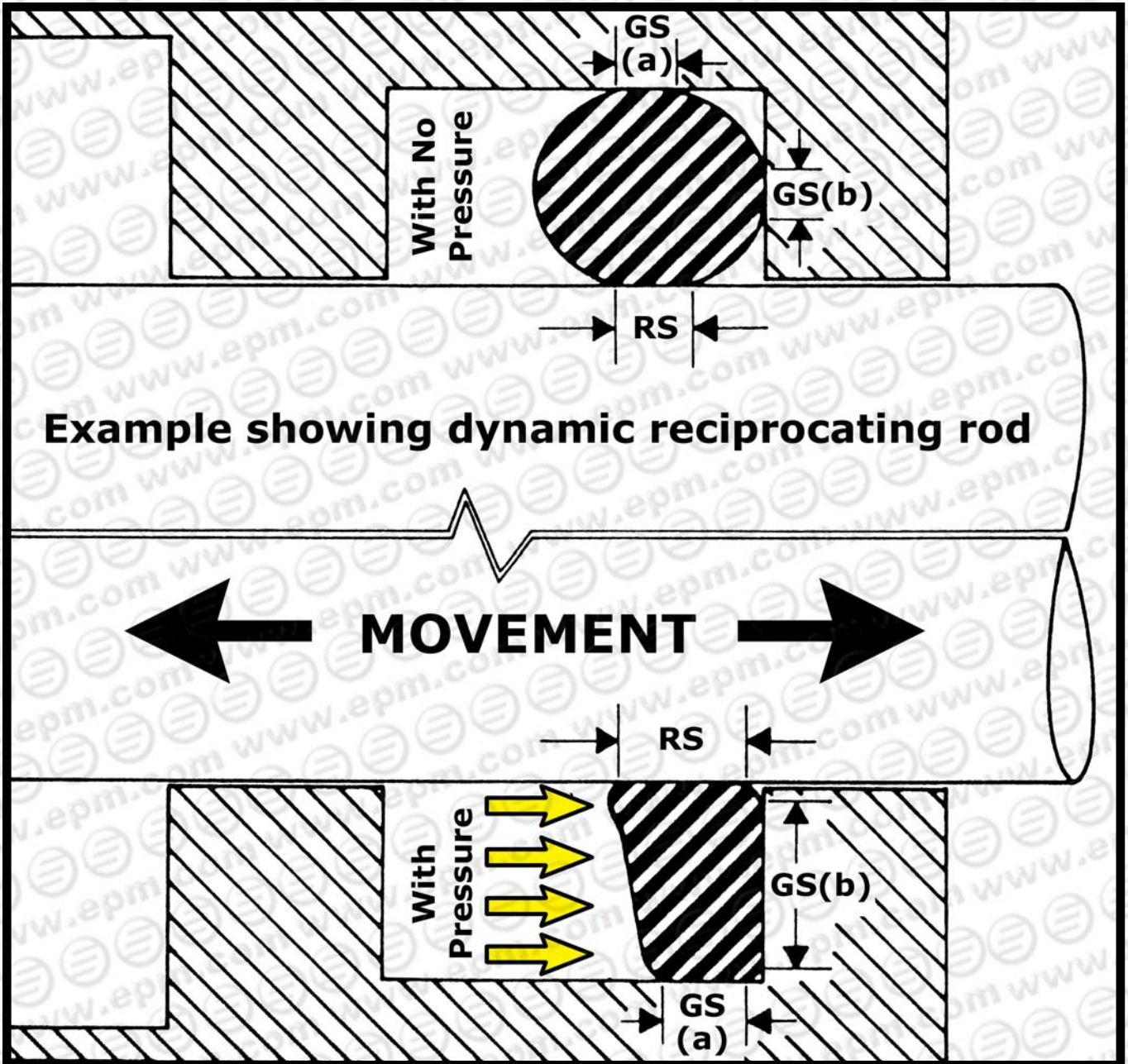


**Like a pencil eraser, an O-Ring is being worn away even though you may not see it until failure.**

## Major Dynamic Sealing Problems

# SEALABILITY

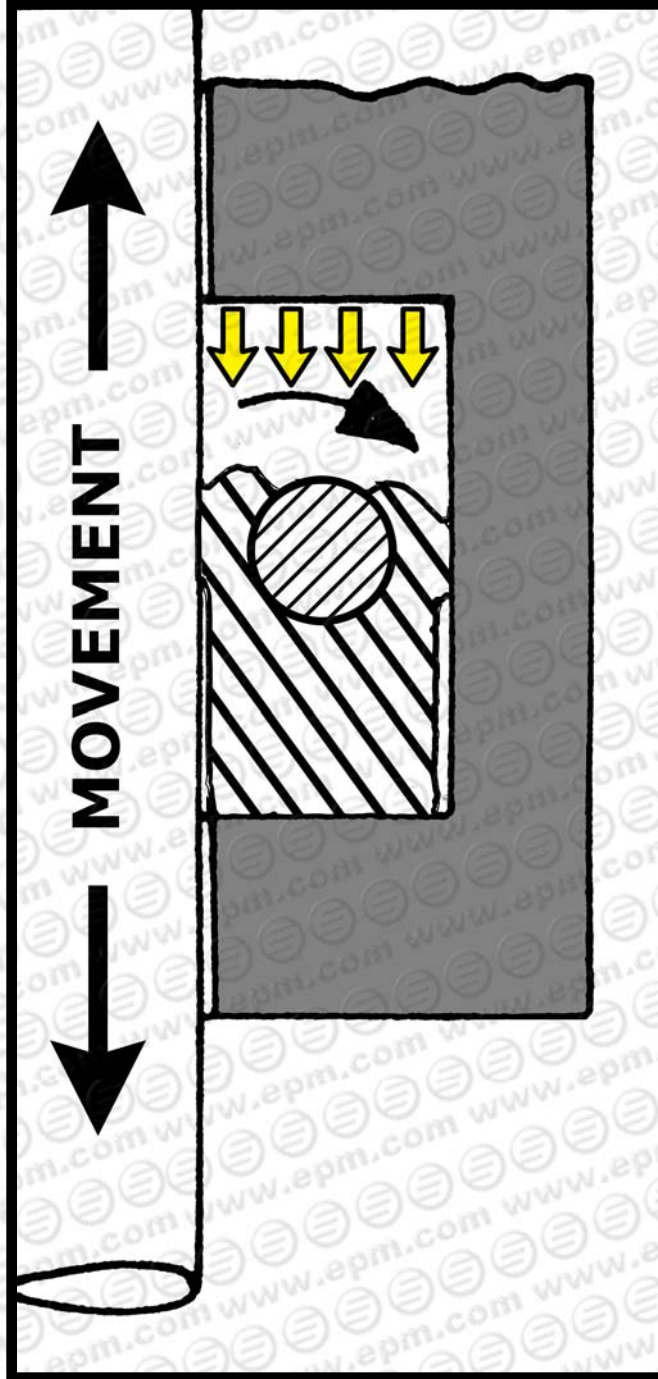
Sealability is the ability of a material to conform to a surface to block the flow of a liquid.



## Major Dynamic Sealing Problems

# STABILITY

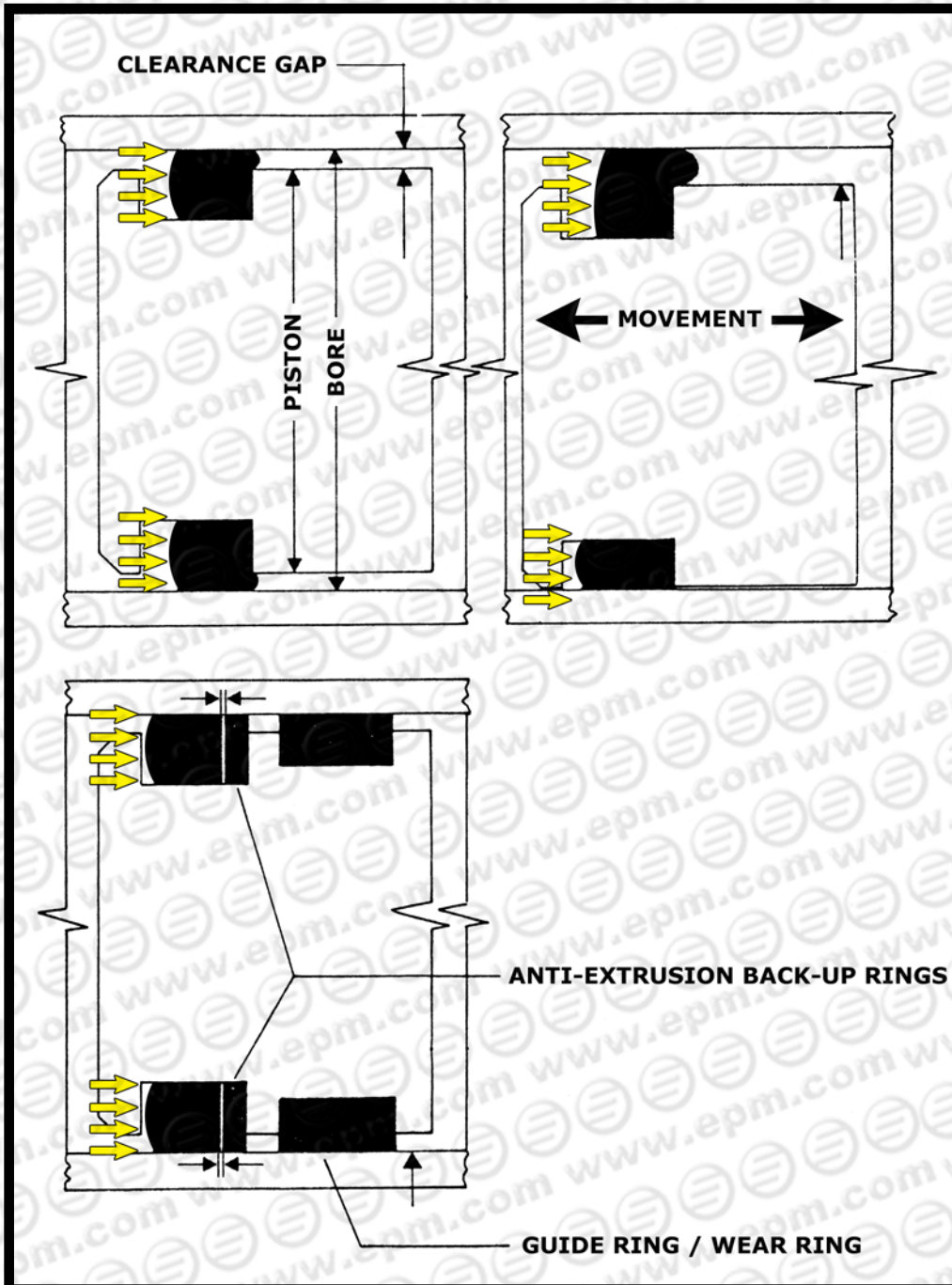
Stability is the ability of a seal to resist rolling, twisting and shifting in a groove.



## Major Dynamic Sealing Problems

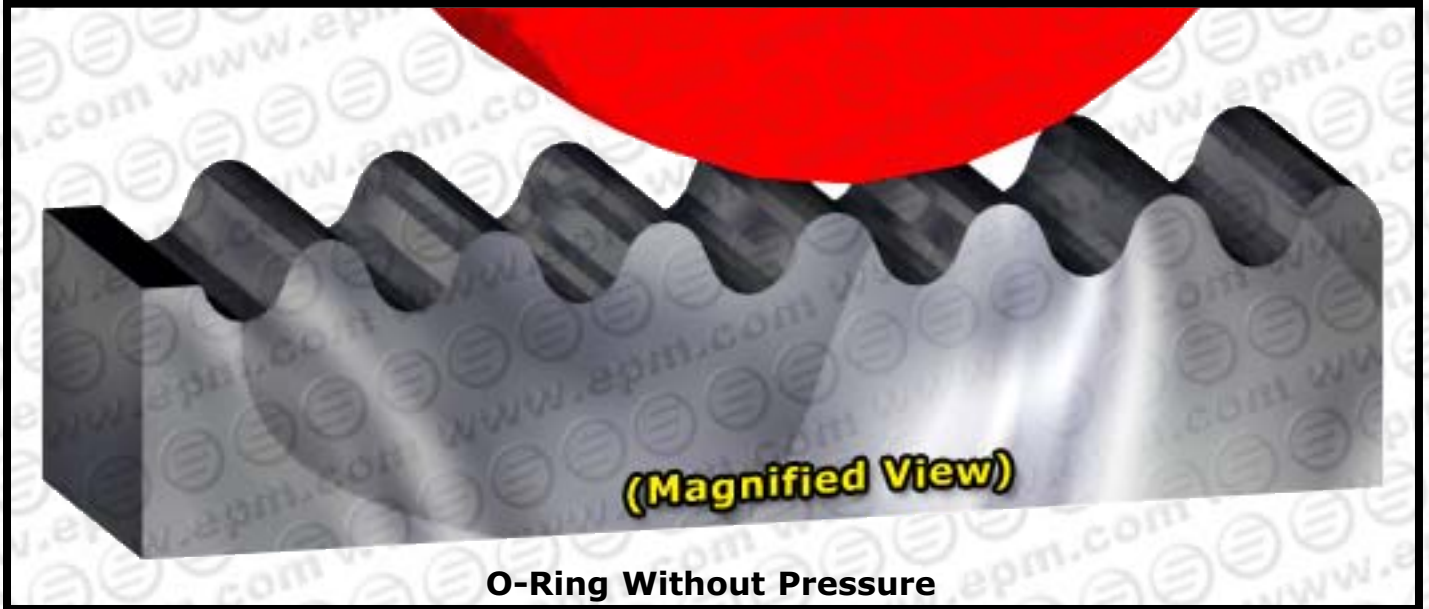
# EXTRUSION

Extrusion is the flowing of the seal's body into the clearance gap under pressure.



## Conformability

Conformability is the ability of a seal compound to fill or dam the minute irregularities that are in the metal surface.



## Why Do O-Rings Fail?

O-Rings, made of an elastomeric material, are unlike other materials. The reason for this is because in order for an O-Ring to function properly it has to deform. Once an O-Ring is installed into a gland it is then compressed resulting in zero clearance. It's that zero clearance that seals the flow of fluids and gases. As the actuating pressure increases, so does the force acting on the surfaces, making a tighter seal and deforming the O-Ring. This sealing procedure works well for a lot of fluid-power systems. However, in order for it to work well it requires careful design, selection, and installation procedures.

The combined effects of different environmental factors usually result in a typical O-Ring failure. Some of the most common causes of an O-Ring failure are:

- A.** Incompatibility between the O-Ring material and the fluid it is to seal. (See our [Fluid Compatibility Guide](#) on [pages 44-103](#))
- B.** The wrong O-Ring size.
- C.** O-Ring not installed correctly.
- D.** Improper gland design. This allows for too much compression and too little compression, not enough room for displacement under compression, or tolerance stack-up.
- E.** Not enough O-Ring lubrication.





## O-Ring Failure Analysis

### COMPRESSION SET



#### **Description of failure appearance:**

This failure is common to both static and dynamic sealing applications. This type of failure produces flat surfaces on the sides of the O-Ring that were compressed, usually the top and bottom if sitting flat on a desk.

#### **The sources of COMPRESSION SET failure:**

- The O-Ring material used has poor compression set resistance
- The O-Ring material used has limited resistance to heat
- The O-Ring is swelling in the groove due to fluid incompatibility
- The O-Ring has too much squeeze in the groove

#### **How to eliminate COMPRESSION SET failure:**

- Use a higher quality, low compression set material
- Check the compatibility of the O-Ring material to the fluid
- Select a material good for heat produced in operation
- Double check the groove dimensions for proper squeeze
- Check existing O-Ring stock for physical properties

# O-Ring Failure Analysis

## ABRASION



### Description of failure appearance:

This failure is most common in dynamic sealing applications - like reciprocating and rotating shafts. This type of failure produces a flattened surface on the side of the O-Ring body subjected to the movement.

### The sources of ABRASION failure:

- The metal surfaces are too rough and are abrasive to the O-Ring
- The metal surfaces are too smooth, not allowing proper lubrication
- No lubrication in the design
- Operating temperatures are too high for the material
- The system fluid is contaminated with abrasive particles

### How to eliminate ABRASION failure:

- Change surface finishes to recommended
- Arrange for better lubrication
- Use a material suitable for higher temperatures
- Eliminate any source of contamination
- Change to a more abrasion resistant O-Ring material

# O-Ring Failure Analysis

## INSTALLATION



### Description of failure appearance:

This failure can occur in both static and dynamic O-Rings. Short nicks or scratches or peeling on the surface of the O-Ring can be noticed.

### The sources of INSTALLATION failure:

- The use of sharp edged tools
- Sharp corners on the O-Ring groove
- Sharp threads that the O-Ring passes over
- No lead-in chamfer
- O-Ring was not lubricated
- O-Ring was twisted or trapped between metal surfaces
- Poor quality of the material

### How to eliminate INSTALLATION failure:

- Cover all threads with masking tape
- Break all sharp edges
- Create a 15 to 20 degree lead-in chamfer
- Lubricate O-Ring during installation
- Use correct sized O-Ring

## O-Ring Failure Analysis

### EXPLOSIVE DECOMPRESSION



#### **Description of failure appearance:**

You will find random ruptures, crater-like pores and small slits, which have originated within the body of the O-Ring.

#### **The sources of EXPLOSIVE DECOMPRESSION failure:**

- Gases permeating the O-Ring material
- Rapid decompression of those gases
- Micro-explosions occurring as decompression takes place

#### **How to eliminate EXPLOSIVE DECOMPRESSION failure:**

- Slow system cycles down
- Increase time for decompression
- Replace with a harder material
- Select a smaller O-Ring cross section

## O-Ring Failure Analysis

### HEAT HARDENING AND OXIDATION



#### **Description of failure appearance:**

You will see this failure in both static and dynamic O-Rings. A flattened area will appear on the dynamic surface. Sometimes cracked, hardened and pitted areas can be seen throughout the entire body of the O-Ring.

#### **The sources of HEAT HARDENING AND OXIDATION:**

- Temperatures higher than recommended for the material
- Elastomers becoming dry and portions of the material evaporating
- Oxidation

#### **How to eliminate HEAT HARDENING AND OXIDATION:**

- Lower the operating temperatures of the system
- Use O-Rings rated for higher temperatures

## O-Ring Failure Analysis

### SPIRAL DAMAGE



#### **Description of failure appearance:**

The surface of the O-Ring appears to have been twisted, or to have rolled in its groove or against a reciprocating rod. It stays in this position when freed.

#### **The sources of SPIRAL DAMAGE:**

- Side loads causing excessive clearance
- Mis-fit components
- No suitable lubrication
- Material too soft
- Moving speed too slow
- Surfaces are uneven

#### **How to eliminate SPIRAL DAMAGE:**

- Decrease the clearances between components
- Check for roundness of fitting parts
- Machine surfaces to suitable finishes
- Provide lubrication
- Select a harder material
- Add a back-up ring

## O-Ring Failure Analysis

### EXTRUSION



#### **Description of failure appearance:**

You will see a ridge, nibbles and small missing pieces of the material along either the inner diameter or outer diameter due from the down-stream side of the O-Ring.

#### **The sources of EXTRUSION:**

- Excessive system pressures
- Too much clearance between mating parts
- Material too soft
- O-Ring body too large for the groove
- Improperly machined groove
- Attack by system fluid

#### **How to eliminate EXTRUSION:**

- Decrease or regulate system pressure
- Refit mating parts, machining back to proper, concentric fit
- Select a harder material
- Determine correct O-Ring cross section size
- Add back-up rings
- Re-machine groove to include clean, smooth groove edges
- Replace O-Ring with different type of seal



## O-Ring Failure Analysis

### EXCESSIVE SWELL



#### **Description of failure appearance:**

Identified by obvious dimension of the body of the O-Ring. Reduced physical properties, which causes improper fit. Heat and friction accelerates seal failure.

#### **The source of EXCESSIVE SWELL:**

- The material absorbs system fluids causing swelling
- An obvious chemical incompatibility

#### **How to eliminate EXCESSIVE SWELL:**

- Test material for fluid compatibility
- Consult a chemical compatibility chart to determine suitable material



## O-Ring Failure Analysis

### WEATHERING OR OZONE CRACKING



#### **Description of failure appearance:**

Exposure of either static or dynamic sealing O-Ring to weather, atmosphere, pollutants and ultra-violet light.

#### **The source of WEATHERING OR OZONE CRACKING:**

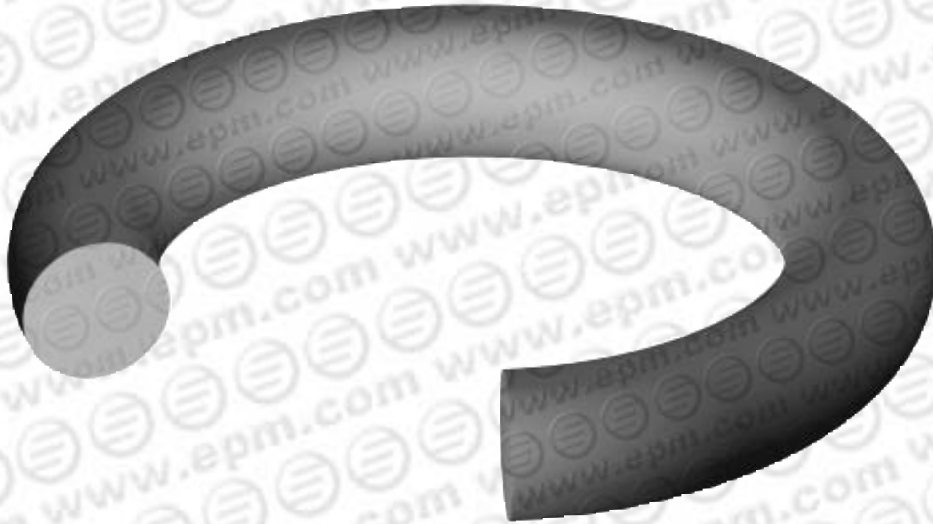
- Attack of the polymer chains, destruction of the material causing cracking

#### **How to eliminate WEATHERING OR OZONE CRACKING:**

- Select a material that resists ozone exposure

## O-Ring Failure Analysis

### NO APPARENT REASON FOR FAILURE



#### **Description of failure appearance:**

Difficult to pin-point due to non-obvious, unseen reasons

#### **The source of NO APPARENT REASON FOR FAILURE:**

- Combined tolerances of all components not correct
- Not enough squeeze
- Parts not fitting properly
- Components not round
- Too much flash, remaining rubber on O-Ring
- Improper groove shape

#### **How to eliminate NO APPARENT REASON FOR FAILURE:**

- Re-machine all parts for proper sizing tolerances
- Make sure the amount of squeeze is correct
- Double check the design
- Replace components not fitted correctly
- Select a different material or O-Ring source for clean ground outer diameters
- Check published data for groove shapes and sizing

## "The Top Four Causes of Hydraulic Cylinder Seal Failure"

by Jerry Whitlock - The Seal Man™

Hydraulic cylinder seals cost the manufacturer pennies. They are usually purchased on a low bid basis. But, that simple, inexpensive seal can cost you thousands in downtime and loss of production if it fails. If you have a problem seal, focus on these four points to help determine the cause of failure.

**1. Improper installation** is a major cause of seal failure. The important things to be watched during seal installation are: (a) cleanliness, (b) protecting the seal from nicks and cuts, and (c) proper lubrication. Other problem areas are over tightening of the seal gland where there is an adjustable gland follower or folding over a seal lip during installation. Installing the seal upside down is a common occurrence, too. The solution to these problems is common sense and taking reasonable care during assembly.



**2. System contamination** is another major factor in hydraulic seal failure. It is usually caused by external elements such as dirt, grit, mud, dust even ice and internal contamination from circulating metal chips, break-down products of fluid, hoses or other degradable system components. As contamination can be prevented by a proper filtering of system fluid. Contamination is indicated by scored road and cylinder bore surfaces, excessive seal wear and leakage - and sometimes tiny pieces of metal imbedded in the seal.



**3. Chemical breakdown** of the seal material is most often the result of incorrect material selection in the first place or a change of hydraulic system fluid. Misapplication or use of non-compatible materials can lead to chemical attack on the seal by fluid additives, hydrolysis anoxidation reduction of seal elements. Chemical breakdown can result in loss of seal lip interface, softening of seal durometer, excessive swelling or shrinkage. Discoloration of the seal can also be an indicator of chemical attack.



continued on next page...

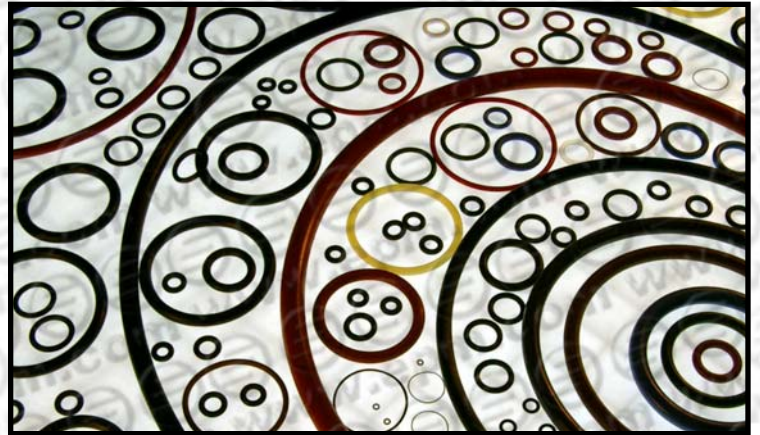
# “The Top Four Causes of Hydraulic Cylinder Seal Failure” by Jerry Whitlock - The Seal Man™

(continued)

**4. Heat degradation** is to be suspected when the failed seal exhibits a hard, brittle appearance and/or shows a breaking away of parts of the seal lip or body. Heat degradation results in loss of sealing lip effectiveness through, excessive compression set and/or loss of seal material. Causes of their condition may be use of incorrect seal material, high dynamic friction, excessive lip loading, no heel clearance and proximity to outside heat source. Correction of heat degradation problems may involve reducing seal lip interference, increasing lubrication, or a change of the seal material. In borderline situations consider all upper temperature limits to be increased by 50 degrees Fahrenheit in hydraulic cylinder seals at the seal interface due to running friction caused by the sliding action of the lips.



Here's a secret - it is not necessary to buy replacement seals from the original hydraulic cylinder manufacturer. Many seal suppliers have the same exact seals that are used in most hydraulic cylinders and can easily cross reference or match up a replacement. In many cases, if there is a recurring problem with a seal, our seal specialist can recommend a solution and increase the life of the seal.



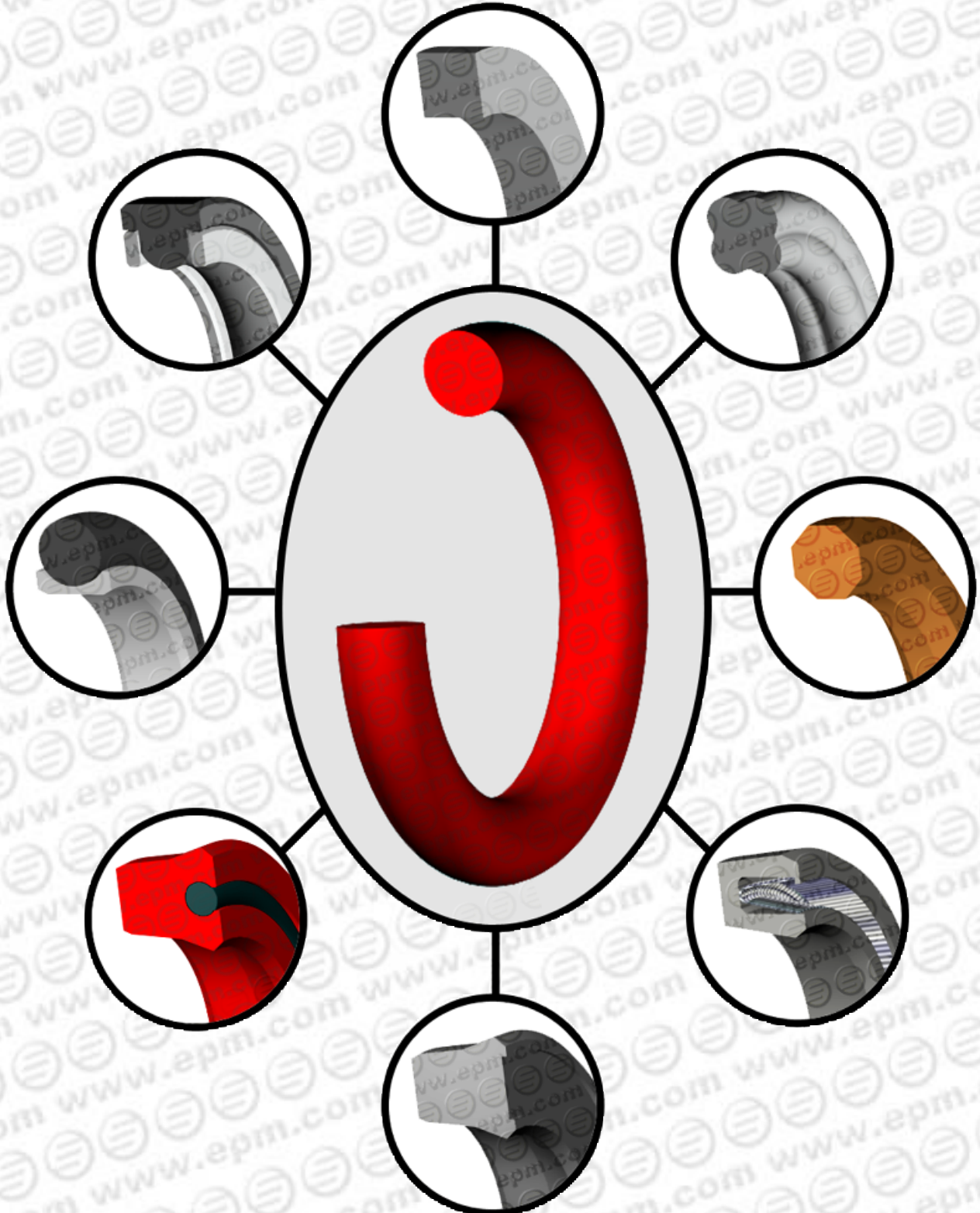
Jerry Whitlock is known as The Seal Man™. He has over 30 years experience in the seal industry. Jerry owns and operates EPM, Inc. located in Atlanta, GA. His web site - [www.epm.com](http://www.epm.com) - is the largest and most visited web site for seals on the internet.

## More O-Ring Failure Information

See our complete [O-Ring Failure Analysis](#) section beginning on [page 17](#) for more detailed information about O-Ring failures. Also, you can contact your EPM Customer Helper and ask about our Free Seal Failure Analysis.

## Other Seal Types That Will Replace O-Rings

Any of the seal types below can be used in the place of an O-Ring.



**EPM can supply any of these seals.**

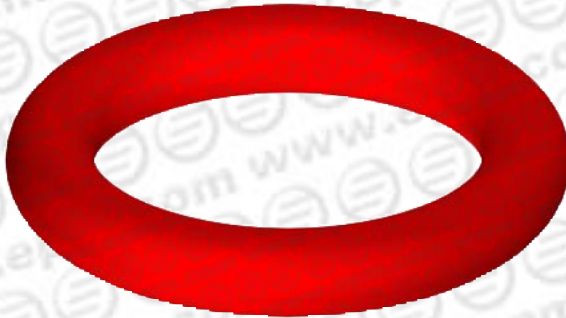


## Material Selection Guide

Here is a list of available O-Ring materials. Material usage will depend upon the environment the O-Ring is to be used in. Various fluids, gases, temperatures, and other environmental properties will affect the material. Please review this guide and our [Fluid Compatibility Guide](#) on [pages 44-103](#) to help you in your material selection.

\*Note: This is to serve as a reference guide only. Please contact your EPM Customer Helper regarding any questions or for more information on any material.

| Seal Material                                                                         | Hardness                                                           |               | Color                                                                         | Temperature Limits                                    | Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                       | Machined O-Ring                                                    | Molded O-Ring |                                                                               |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p><b>HPU</b><br/>Polyurethane</p> <p>Also referred to as:<br/>Urethane, HPU, PUR</p> | 95                                                                 | N/A           | <p><b>Red</b></p> <p>(could also be Natural Milky White or honey Colored)</p> | <p><b>-22 to 230°F</b></p> <p><b>-30 to 110°C</b></p> | <p><b>Use in:</b> Hydraulic cylinders as rod seals and piston seals. This material is most commonly used as hydraulic u-cups, rod wipers and packings.</p> <p><b>Description:</b> This is a high performance material with improved resistance to hot water (up to 200°F) makes it ideally suited for mining applications where water based hydraulic fluids are used. Can be used for pressures to 6000 psi. It is excellent in oil based hydraulic fluids. Great abrasion resistance. Resistant to most oils, fuels, and gases. Can be used successfully as a drive belt of various shapes.</p> <p><b>Characteristics:</b> Plastic-like. Shiny surface finish. Difficult to stretch.</p> |
|                                                                                       | See <a href="#">page 37</a> for a <a href="#">hardness scale</a> . |               |                                                                               |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |





## Material Selection Guide

| Seal Material                                                                          | Hardness        |                                      | Color | Temperature Limits                      | Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------|-----------------|--------------------------------------|-------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                        | Machined O-Ring | Molded O-Ring                        |       |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <p><b>NBR</b><br/>Nitrile Rubber</p> <p>Also referred to as:<br/>NBR, Buna-N, Buna</p> | 85              | <p>70<br/>70FDA<br/>70NSF<br/>90</p> | Black | <p>-22 to 210°F</p> <p>-30 to 100°C</p> | <p><b>Use in:</b> Pneumatic seals, O-Rings, oil seal lips, gaskets, washers and low pressure hydraulic seals. Can be used with a back-up ring in higher pressure applications. This is the most popular O-Ring material.</p> <p><b>Description:</b> General purpose elastomer for use as seal energizer or low pressure applications such as hydraulics and pneumatics. Resistant to oils, hydraulic fluids, water fuels, and gases. Not suited for use in brake fluids. Good abrasion resistance. Good resistance to compression set. High tensile strength.</p> <p><b>Characteristics:</b> Rubber-like elastomer. Dulle, matte finish. Some NBR O-Rings have a very shiny surface.</p> |
| See <a href="#">page 37</a> for a <a href="#">hardness scale</a> .                     |                 |                                      |       |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |



| Seal Material                                                                                                                                            | Hardness        |                  | Color | Temperature Limits                      | Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|-------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                          | Machined O-Ring | Molded O-Ring    |       |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p><b>HNBR</b><br/>Highly Saturated Nitrile Rubber</p> <p>Also referred to as:<br/>HNBR, Hydrogenated Nitrile, Hydrogenated NBR, Hydrogenated Buna-N</p> | 85              | <p>70<br/>90</p> | Black | <p>-13 to 302°F</p> <p>-25 to 150°C</p> | <p><b>Use in:</b> Seal and gasket application requiring additional resistance to chemicals and slightly higher temperatures than can be handled with NBR. O-Rings, washers, rod and piston seals, back-up rings, and gaskets.</p> <p><b>Description:</b> HNBR is achieved by hydrogenated NBR. Greatly improved wear and extrusion resistance over standard NBR. Good chemical compatibility and can be used with oils which have aggressive additives. Has an extended high temperature range</p> <p><b>Characteristics:</b> Rubber-like elastomer. Dull finish</p> |
| See <a href="#">page 37</a> for a <a href="#">hardness scale</a> .                                                                                       |                 |                  |       |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |



## Material Selection Guide

| Seal Material                                                                                                           | Hardness        |               | Color                                                                      | Temperature Limits                                     | Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------|-----------------|---------------|----------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                         | Machined O-Ring | Molded O-Ring |                                                                            |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p><b>VIT</b><br/>Fluoroelastomer<br/>- Viton® -</p> <p>Also referred to as:<br/>VIT, Viton®, FKM,<br/>Fluorocarbon</p> | 85              | 75<br>90      | <p><b>Brown</b><br/><br/>(could also be Black, Green - molded O-Rings)</p> | <p><b>-4 to 392°F</b><br/><br/><b>-20 to 200°C</b></p> | <p><b>Use in:</b> Tough sealing applications requiring extreme chemical resistance. O-Rings. Hydraulic seals. Pneumatic seals.</p> <p><b>Description:</b> An excellent elastomer for use in high temperature applications. Also exhibits excellent chemical resistance for use in harsh environments such as phosphate esters. Widely used in applications dealing with extreme temperature and/or extreme chemicals. It is suitable to use with all chemicals (exception - Skydrol, certain esters and ethers) makes it a popular elastomer in chemical processing, paper/pulp mills, various chemical, acid and solvent applications.</p> <p><b>Characteristics:</b> Rubber-like elastomer. Noticeably heavier than NBR. Dull, non-glossy finish. Smells like cinnamon.</p> |
| See <a href="#">page 37</a> for a <a href="#">hardness scale</a> .                                                      |                 |               |                                                                            |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |



| Seal Material                                                                                          | Hardness        |               | Color               | Temperature Limits                                      | Information                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------|-----------------|---------------|---------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                        | Machined O-Ring | Molded O-Ring |                     |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p><b>EPD</b><br/>EPDM Rubber</p> <p>Also referred to as:<br/>EPD, EPR, EP,<br/>Ethylene Propylene</p> | 85              | 70            | <p><b>Black</b></p> | <p><b>-49 to 300°F</b><br/><br/><b>-45 to 150°C</b></p> | <p><b>Use in:</b> Sealing lips of special oil seals, u-cups, wiper rings, O-Rings, gaskets, washers, and rollers.</p> <p><b>Description:</b> For use in high temperature water, steam and brake fluids. This elastomer must not come in contact with mineral oils or grease. It is used in applications that deal with acids, weak alkalis. EPD is sometimes an acceptable FDA material.</p> <p><b>Characteristics:</b> Rubber-like elastomer. Strong rubber smell.</p> |
| See <a href="#">page 37</a> for a <a href="#">hardness scale</a> .                                     |                 |               |                     |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |





# Material Selection Guide

| Seal Material                                                                                  | Hardness        |               | Color                                                              | Temperature Limits                             | Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------|-----------------|---------------|--------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                | Machined O-Ring | Molded O-Ring |                                                                    |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>SIL</b><br><b>Silicone Rubber</b><br><br>Also referred to as:<br>SIL, Silicone,<br>Silastic | <b>85</b>       | <b>70</b>     | <b>Blue</b><br><br>sometimes white                                 | <b>-75 to 392°F</b><br><br><b>-60 to 200°C</b> | <b>Use in:</b> O-Rings, special low pressure seals, gaskets.<br><br><b>Description:</b> An excellent material generally used for static seals with excellent low and high temperature stability and good resistance to aging. Generally not suited for dynamic applications. due to poor tensile strength and abrasion resistance. Does exhibit excellent resistance to extreme temperature and is an acceptable FDA material. Typical use for silicone is in dry heat applications and food processing applications.<br><br><b>Characteristics:</b> Very springy-like rubber-type material. |
|                                                                                                |                 |               | See <a href="#">page 37</a> for a <a href="#">hardness scale</a> . |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |



| Seal Material                                                                                                                    | Hardness        |               | Color        | Temperature Limits                                                 | Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------|--------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                  | Machined O-Ring | Molded O-Ring |              |                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>TFV</b><br><b>Virgin PTFE</b><br><br>Also referred to as:<br>Teflon®, Virgin Teflon®, PTFE, TFE, TFV, Polytetrafluoroethylene | <b>Solid</b>    | <b>Solid</b>  | <b>White</b> | <b>-328 to 500°F</b><br><br><b>-200 to 260°C</b>                   | <b>Use in:</b> Packings, gaskets, seals, washers, spacers, insulators, wheels, rollers, bearings, guide rings.<br><br><b>Description:</b> An extremely low friction material which remains stable at both low and high temperatures. The chemical resistance of this material is outstanding. Can be used in applications with extreme temperatures, extreme pressures and extreme chemicals. Since Teflon® TFV has a tendency to cold flow and has no memory. It can be filled or mixed with glass, bronze, and nickel to enhance its properties.<br><br><b>Characteristics:</b> Semi-rigid plastic material. Most of the time it is finished by machining. |
|                                                                                                                                  |                 |               |              | See <a href="#">page 37</a> for a <a href="#">hardness scale</a> . |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |



## Material Selection Guide

| Seal Material                                                               | Hardness        |               | Color | Temperature Limits           | Information                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------|-----------------|---------------|-------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                             | Machined O-Ring | Molded O-Ring |       |                              |                                                                                                                                                                                                                                                                                                           |
| <p><b>NEO</b><br/>Neoprene®</p> <p>Also referred to as:<br/>Chloroprene</p> | N/A             | 70            | Black | -65 to 250°F<br>-54 to 121°C | <p><b>Use in:</b> Common applications include, refrigeration seals, freon/air conditioning, motor mounts, engine coolants.</p> <p><b>Description:</b> Good resistance to petroleum oils. Low compression set and good tear and abrasion strength. Good resistance to weathering, sunlight, and ozone.</p> |
| See <a href="#">page 37</a> for a <a href="#">hardness scale</a> .          |                 |               |       |                              |                                                                                                                                                                                                                                                                                                           |



| Seal Material                                                                         | Hardness        |               | Color                | Temperature Limits           | Information                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------|-----------------|---------------|----------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                       | Machined O-Ring | Molded O-Ring |                      |                              |                                                                                                                                                                                                                                                                                                                                                           |
| <p><b>PFR</b><br/>Perfluoro-<br/>lastomer</p> <p>Also referred to as:<br/>Kalrez®</p> | N/A             | 70            | Black with Brown Hue | -20 to 570°F<br>-30 to 300°C | <p><b>Use in:</b> Most likely application environments are for aggressive acids, solvents, and steam. Could be suited for many non-oxidizing dry process chemicals.</p> <p><b>Description:</b> Broad resistance to chemicals. Low compression set, strong tear resistance. Virtually indestructible. Above average outgassing performance in vacuums.</p> |
| See <a href="#">page 37</a> for a <a href="#">hardness scale</a> .                    |                 | 75            |                      |                              |                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                       |                 | 90            |                      |                              |                                                                                                                                                                                                                                                                                                                                                           |



## Material Selection Guide

| Seal Material                                                                     | Hardness                                                           |               | Color | Temperature Limits               | Information                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------|-------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                   | Machined O-Ring                                                    | Molded O-Ring |       |                                  |                                                                                                                                                                                                                                                                                                 |
| <b>FSI</b><br><b>Fluorosilicone</b><br><br>Also referred to as:<br>Silastic L.S.® | N/A                                                                | 70            | Blue  | -80 to 350°F<br><br>-62 to 177°C | <p><b>Use in:</b> Common applications include, aircraft fuel systems, jet fuel/gasoline, petroleum oils, synthetic jet oil.</p> <p><b>Description:</b> Fluorosilicone is a mix of Fluorocarbon (Viton®) and Silicone. Wide range of fluid and chemical resistance. Large temperature range.</p> |
|                                                                                   | See <a href="#">page 37</a> for a <a href="#">hardness scale</a> . |               |       |                                  |                                                                                                                                                                                                                                                                                                 |



| Seal Material                                                                               | Hardness                                                           |               | Color | Temperature Limits               | Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------|-------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                             | Machined O-Ring                                                    | Molded O-Ring |       |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AFL</b><br><b>Aflas®</b><br><br>Also referred to as:<br>Tetrafluoroethylene<br>Propylene | Check with EPM for availability                                    | 75            | Black | -20 to 400°F<br><br>-28 to 204°C | <p><b>Use in:</b> Common applications include, O-Rings for various fluid seals. Not readily available in other seal forms. Petroleum fluids and steam, amines, brake fluids or phosphate esters.</p> <p><b>Description:</b> Excellent resistance to petroleum products, steam, phosphate esters, amines and brake fluids. Broad range media resistance similar to EPD and Viton®. Elastomeric form makes it low in gas permeability.</p> <p><b>Characteristics:</b> Superior heat and wear resistance. Non-abrasive.</p> <p><b>Coef. Friction:</b> .15</p> |
|                                                                                             | See <a href="#">page 37</a> for a <a href="#">hardness scale</a> . |               |       |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |





# Material Selection Guide

| Seal Material                                                                                                                                                                                                    | Hardness        |               | Color                    | Temperature Limits           | Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------|--------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                  | Machined O-Ring | Molded O-Ring |                          |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p><b>EOS</b><br/>Armor-O-Rings™<br/>Silicone Core</p> <p>Also referred to as:<br/>Teflon® Encapsulated Silicone O-Rings,<br/>PTFE Encapsulated Silicone O-Rings,<br/>PTFE-FEP Encapsulated Silicone O-Rings</p> | N/A             | 70 (core)     | Orange with opaque shell | -40 to 401°F<br>-40 to 205°C | <p><b>Use in:</b> To improve O-Ring performance in difficult applications where silicone O-Rings alone fail.</p> <p><b>Description:</b> Armor-O-Rings™ EOS are produced using a thin PTFE shielded tubing fully encasing a silicone rubber core. The outer jacket protects the resilient silicone core from the fluids the O-Ring contacts.</p> <p><b>Characteristics:</b> Semi-rigid PTFE-FEP tubing fully encapsulating the silicone core material.</p> <p><b>Material:</b> PTFE-FEP jacket with a minimum thickness of .008" over a silicone core.</p> |
| See <a href="#">page 37</a> for a <a href="#">hardness scale</a> .                                                                                                                                               |                 |               |                          |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

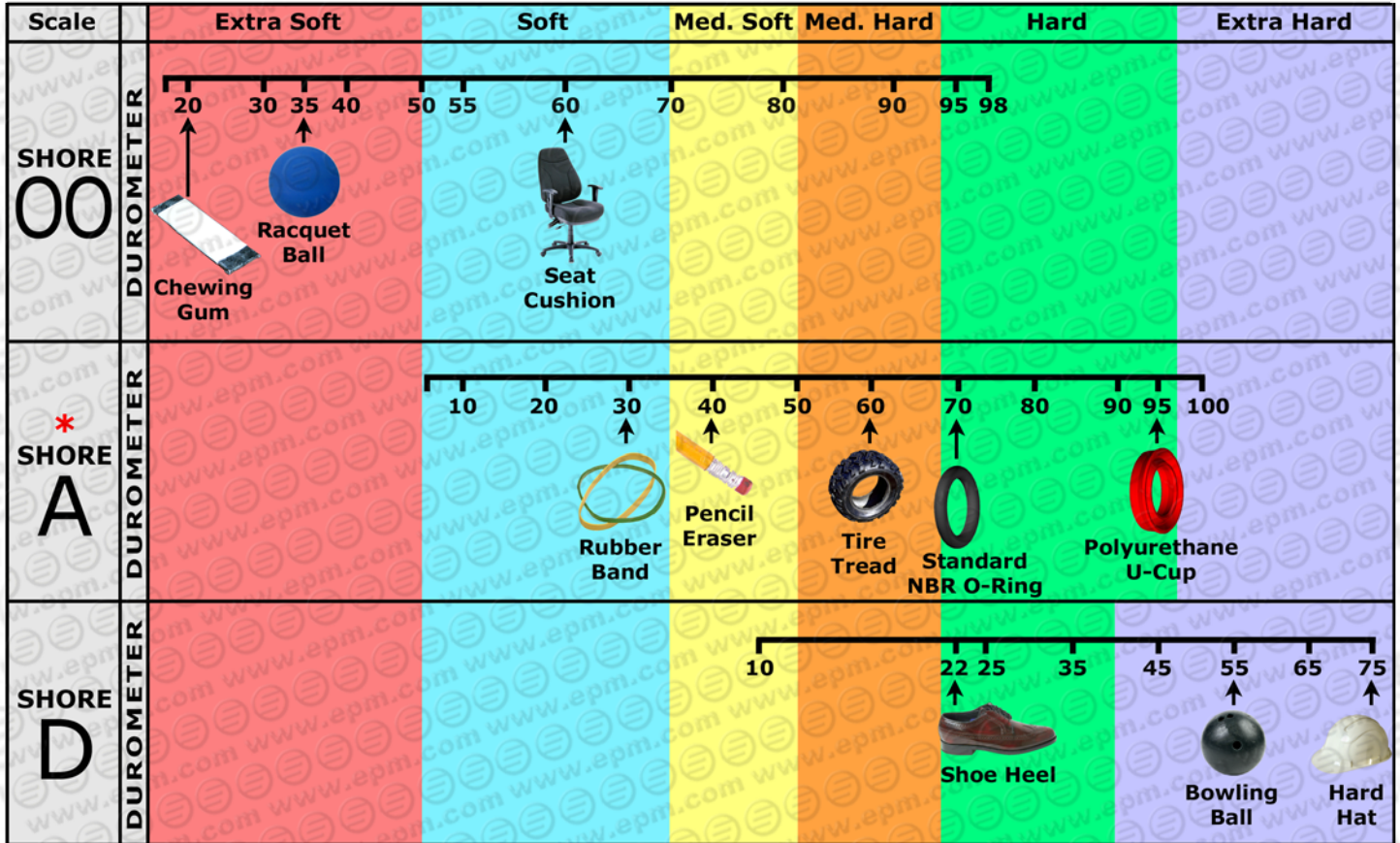


| Seal Material                                                                                                                                                                                    | Hardness        |               | Color                   | Temperature Limits           | Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------|-------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                  | Machined O-Ring | Molded O-Ring |                         |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p><b>EOV</b><br/>Armor-O-Rings™<br/>Viton® Core</p> <p>Also referred to as:<br/>Teflon® Encapsulated Viton® O-Rings, PTFE Encapsulated Viton® O-Rings, PTFE-FEP Encapsulated Viton® O-Rings</p> | N/A             | 75 (core)     | Black with opaque shell | -99 to 401°F<br>-73 to 205°C | <p><b>Use in:</b> To improve O-Ring performance in difficult applications where Viton® alone fails.</p> <p><b>Description:</b> Armor-O-Rings™ EOV are produced using a thin PTFE shielded tubing fully encasing a Viton® elastomeric core. The outer jacket protects the resilient Viton® core from the fluids which the O-Ring contacts.</p> <p><b>Characteristics:</b> Semi-rigid PTFE-FEP tubing fully encapsulating the Viton® core material. Endless. No joints.</p> <p><b>Material:</b> PTFE-FEP jacket with a minimum thickness of .008" over a Viton® core.</p> |
| See <a href="#">page 37</a> for a <a href="#">hardness scale</a> .                                                                                                                               |                 |               |                         |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |



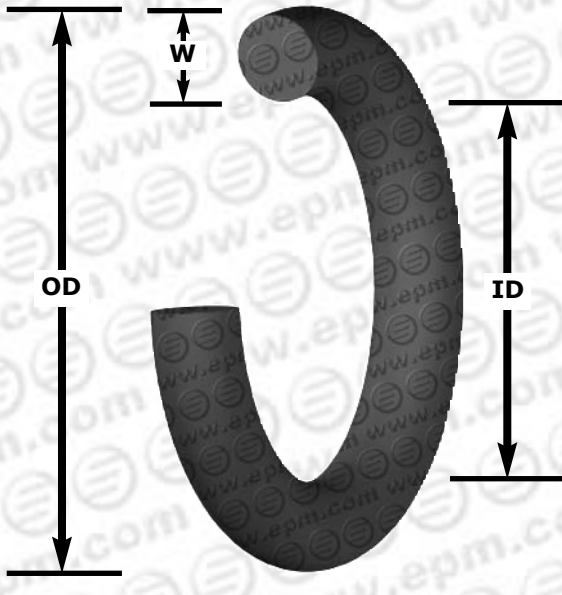
# Material Hardness Scale

This chart shows the overlapping scales for measuring the hardness of non-metallic materials.



← Softer Harder →

**\*The Shore A scale is used to measure the hardness of elastomers, rubber-like materials, and plastomer materials like polyurethane.**



The higher the number the harder the material.

The unit of measure for all of these scales is called durometer.

Example:  
A standard NBR O-Ring is 70 durometer Shore A.

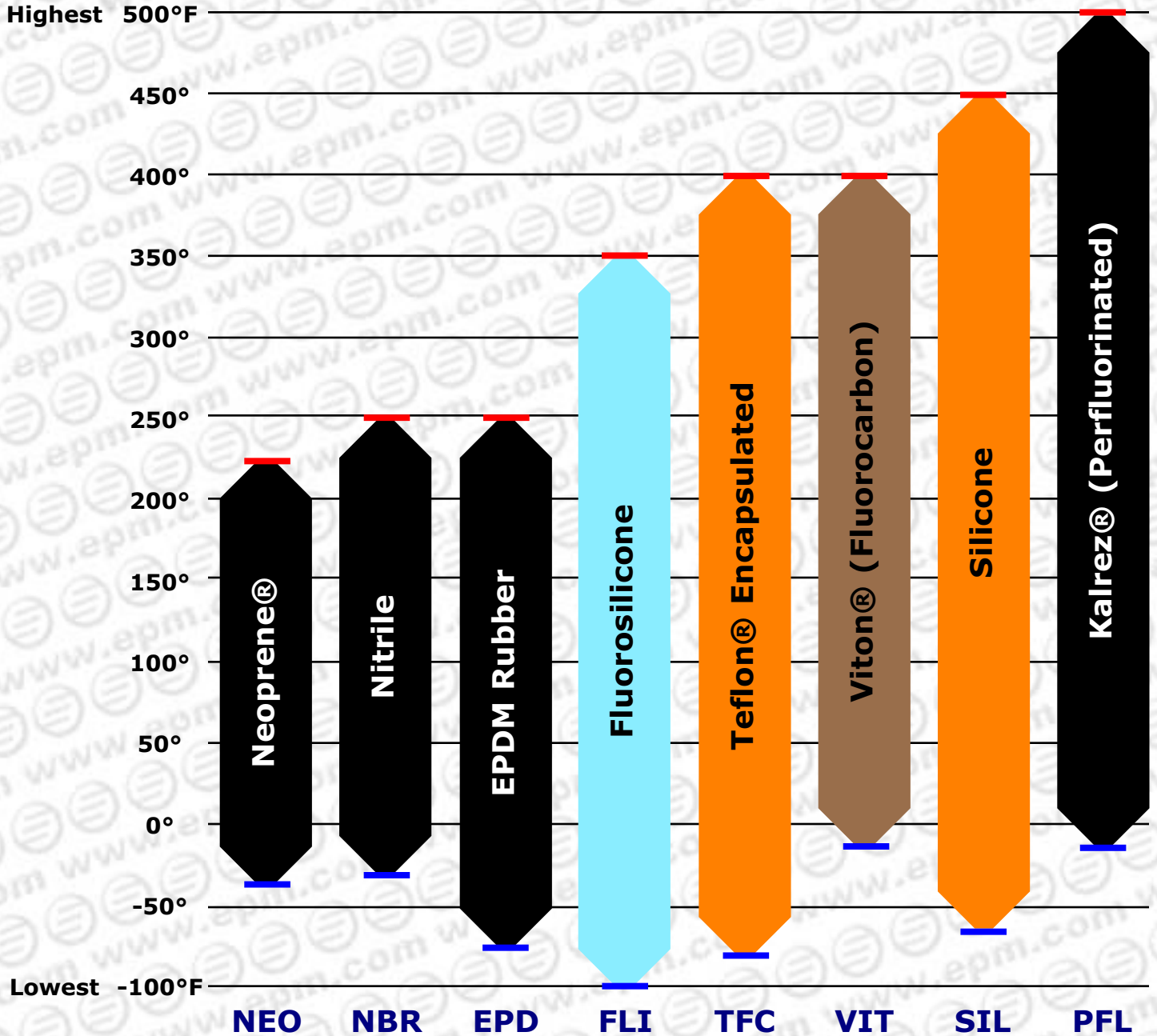




# O-Ring Material Rankings by Temperature Range

**Table Legend**

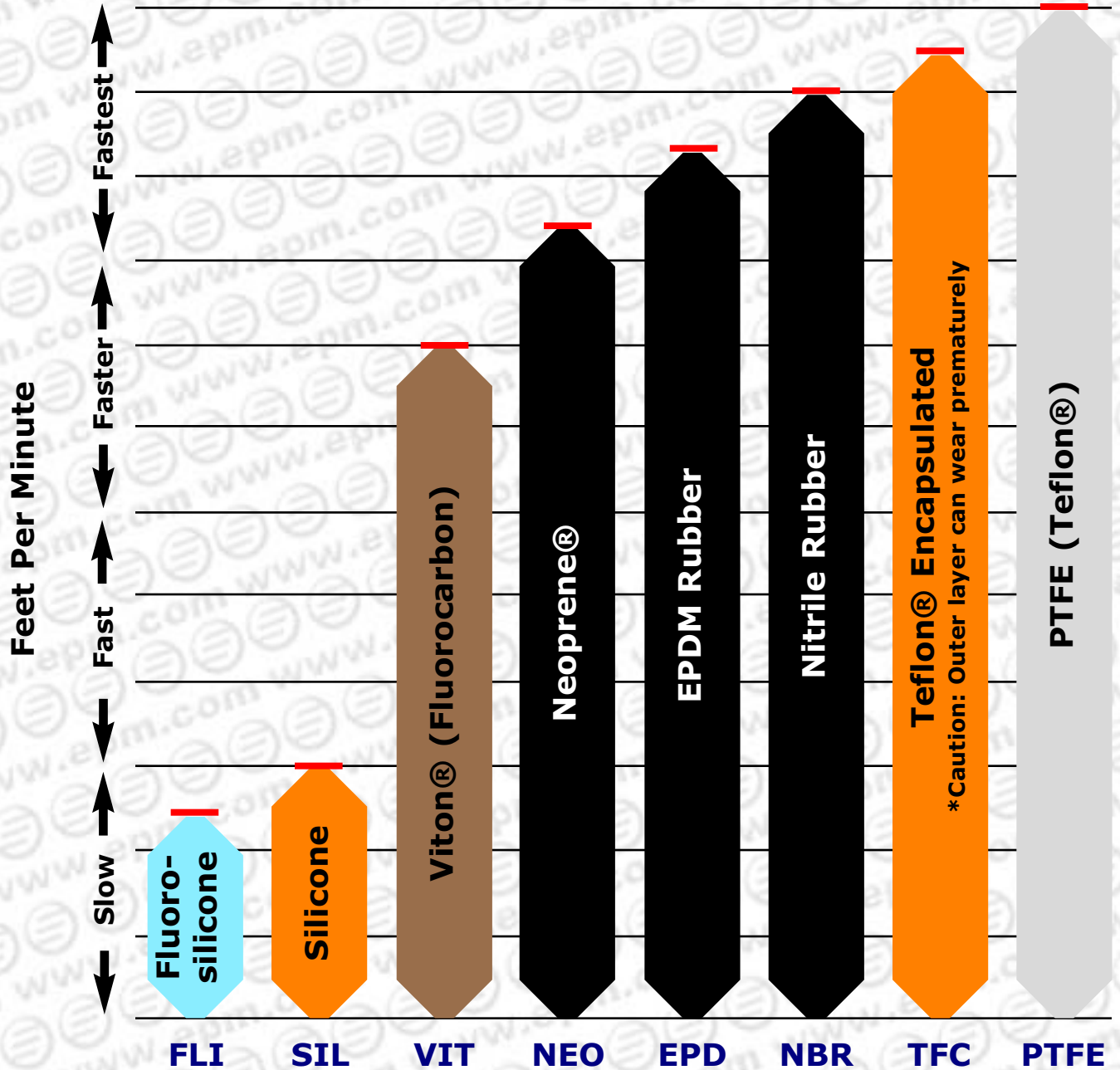
- Highest Recommended Temperature
- Lowest Recommended Temperature





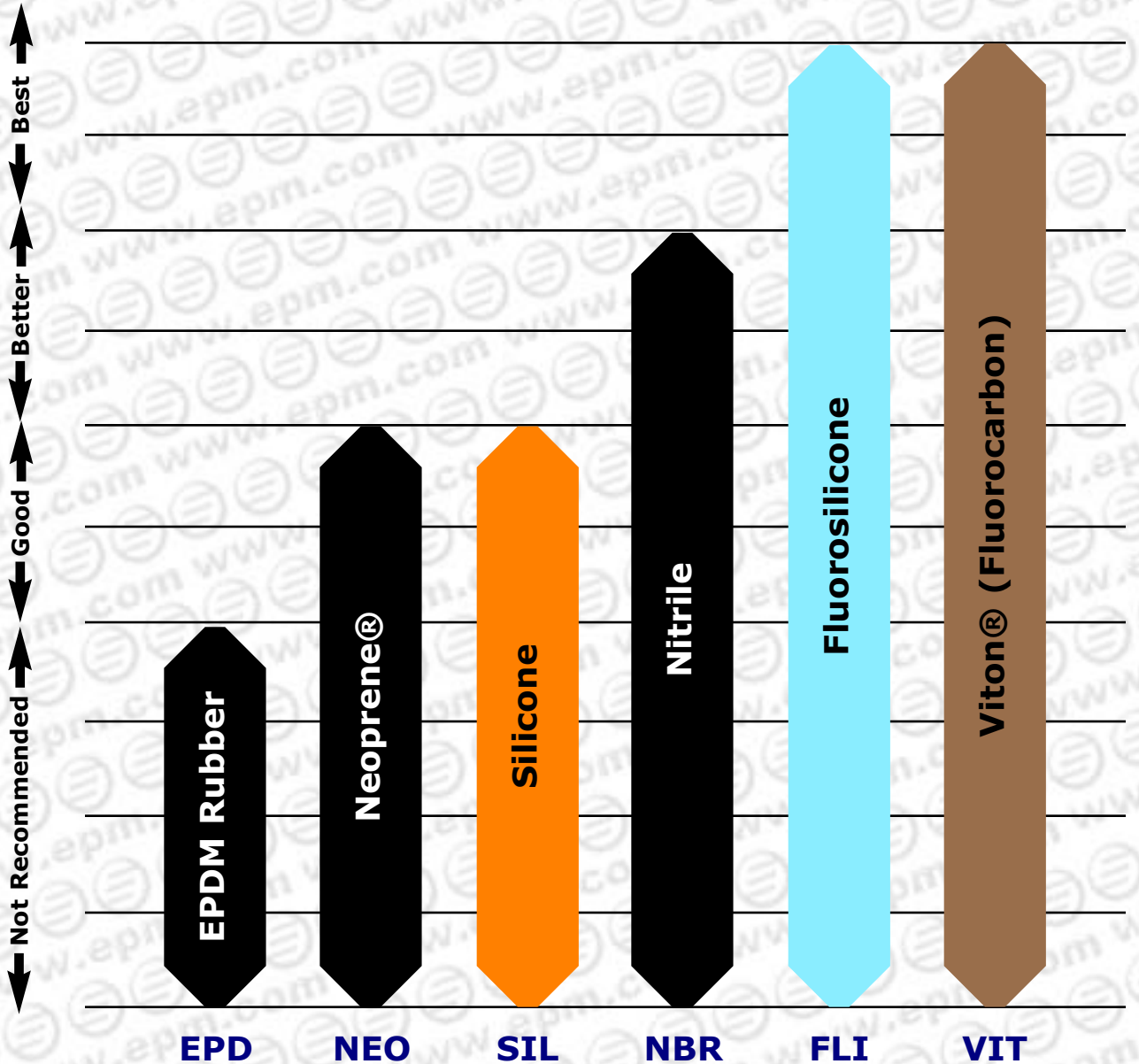
# O-Ring Material Rankings by Surface Speed Limitation

| Table Legend |                       |
|--------------|-----------------------|
|              | Fastest Surface Speed |





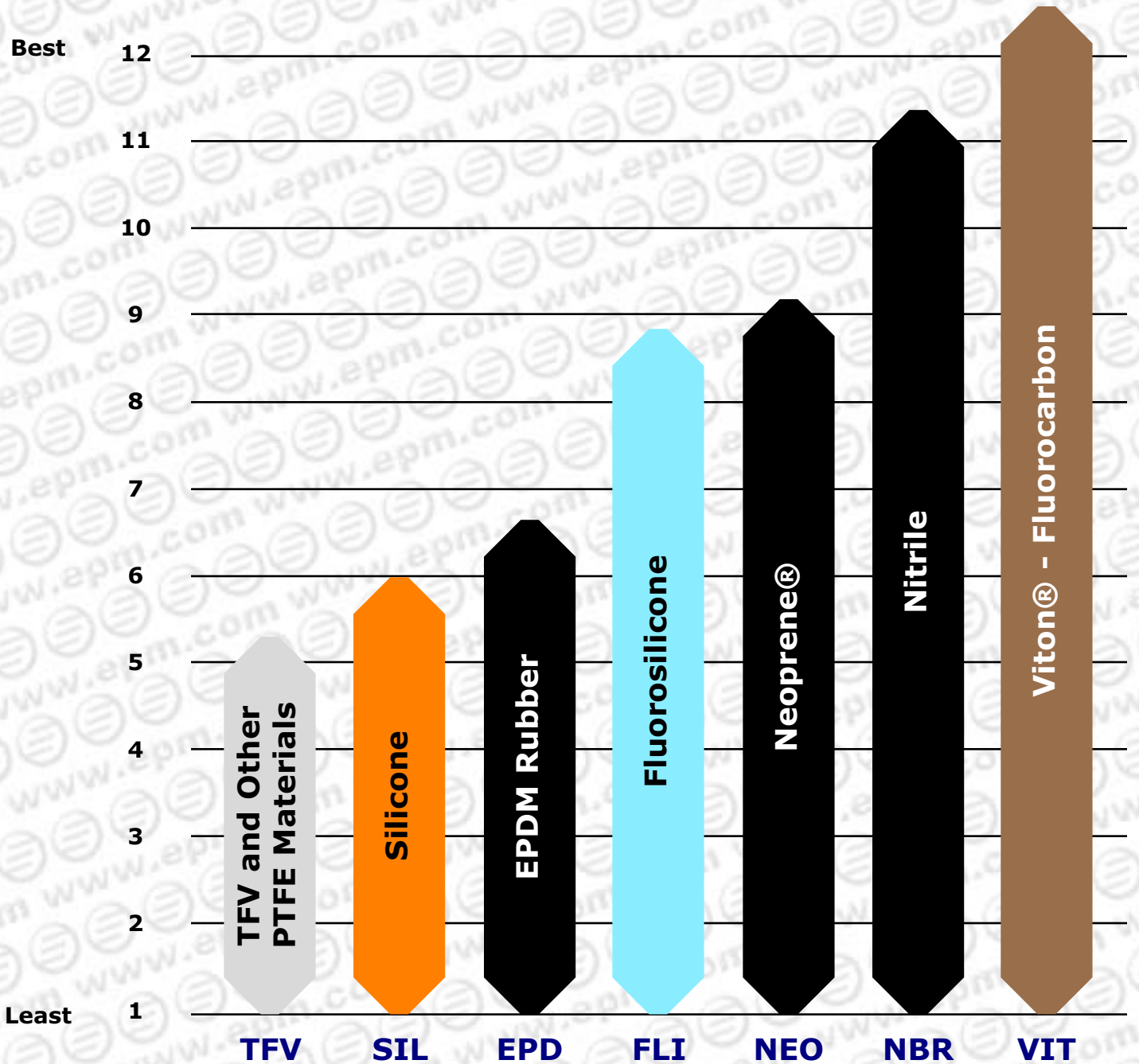
# O-Ring Material Rankings by Oil Resistance







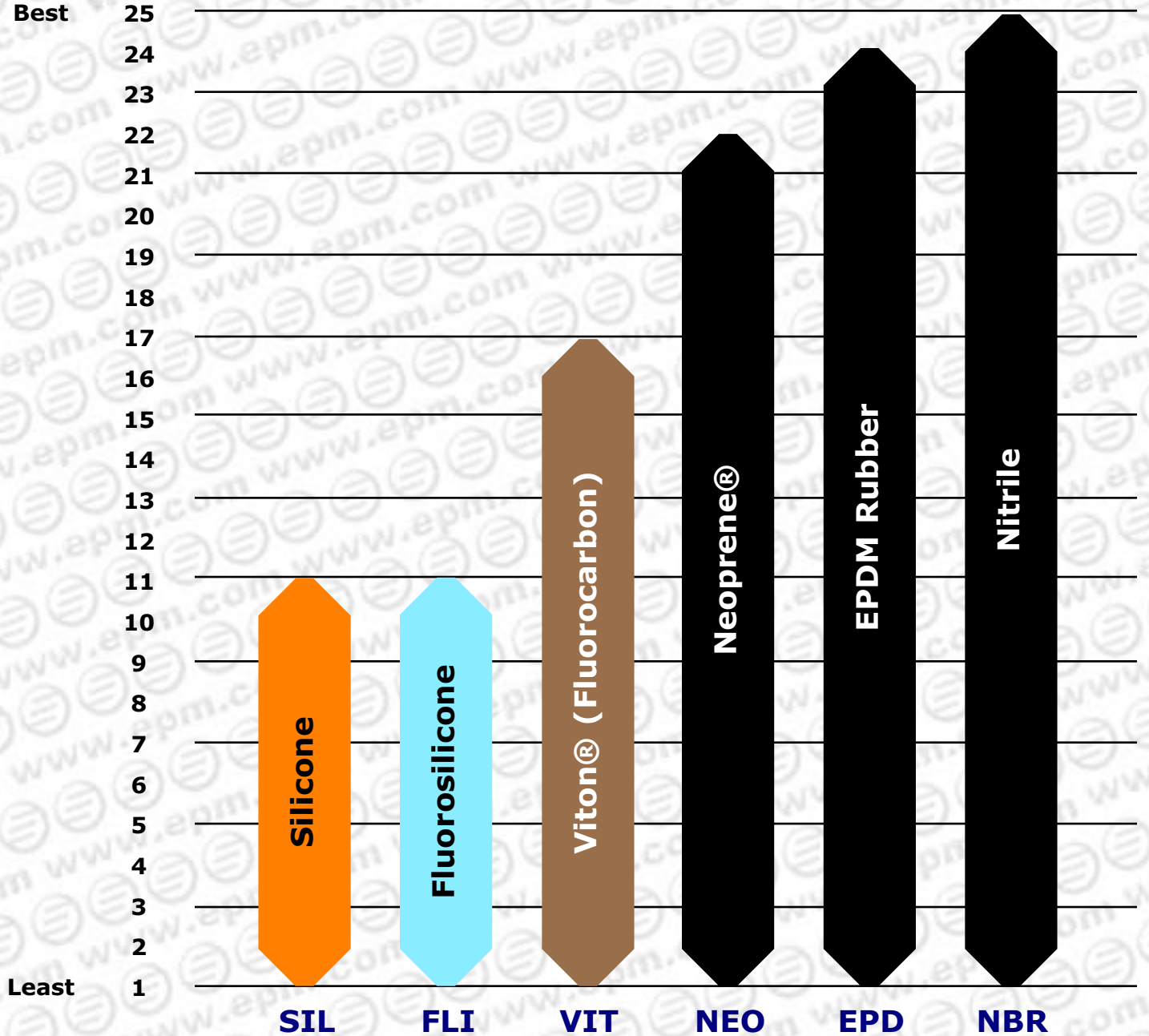
# O-Ring Material Rankings by Abrasion Resistance





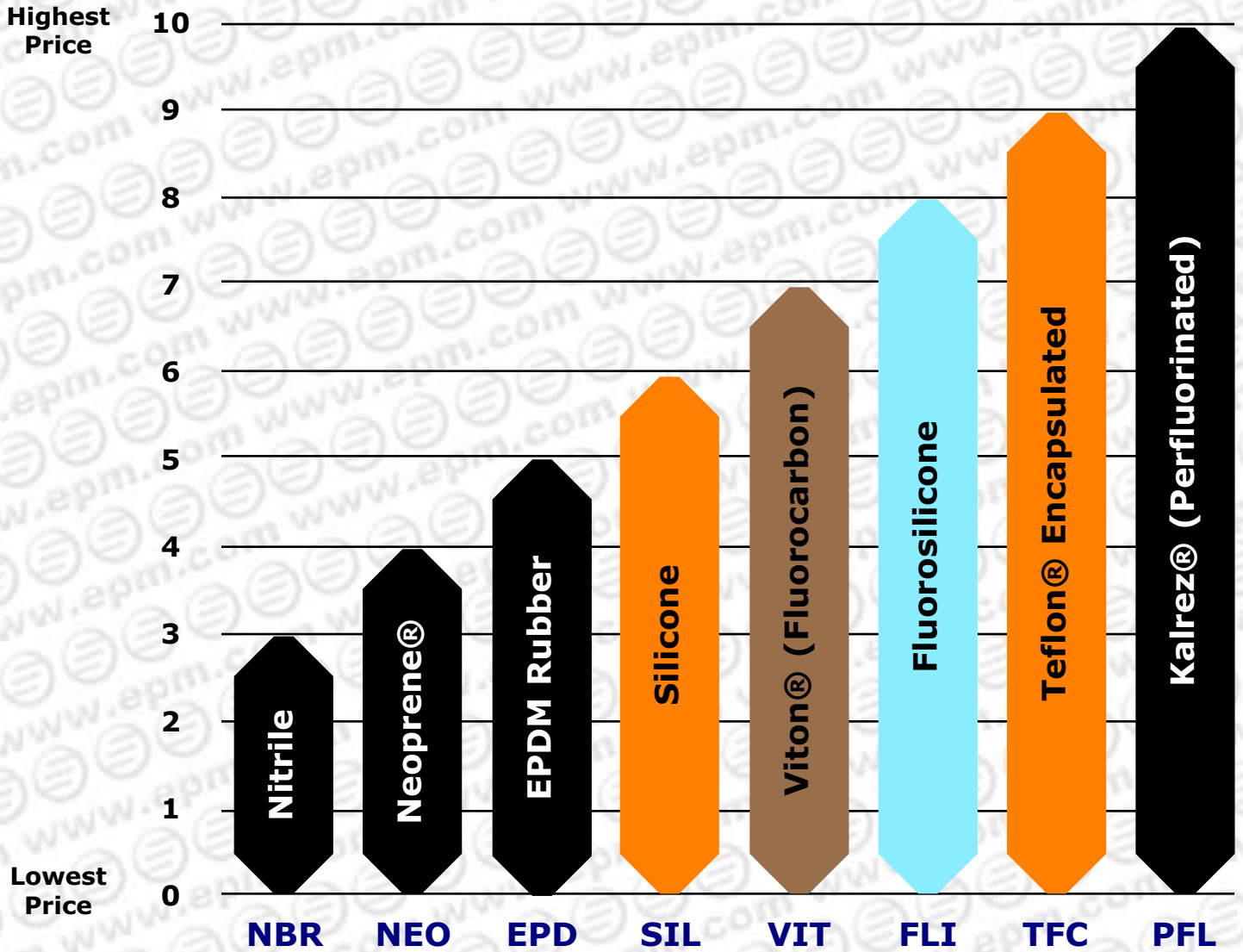
# O-Ring Material Rankings by Tear Resistance

(lb/inch of thickness)





# O-Ring Material Rankings by Relative Price



## Fluid Compatibility Guide

This is to be used as a guide only. These are general guidelines. Users must conduct functional tests to determine the suitability of any compound for a particular application. EPM, Inc. assumes no responsibility.

### Compatibility Rating

1 = Satisfactory      4 = Not Recommended  
 2 = Fair                X = Data Not Available  
 3 = Poor                ◇ = Contact EPM For Info

### Fluid Name

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|--------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Abietic Acid             | X               | X                 | 2                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 5            |
| Acetaldehyde             | 4               | 1                 | 4                         | 4                    | 3                           | 4                    | 2                        | 4                  | 2              | 1              | ◇                             | ◇                           | 4            |
| Acetamide                | 2               | 1                 | 2                         | 1                    | 1                           | 1                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 2            |
| Acetanilide              | X               | X                 | 3                         | 5                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 5            |
| Acetate of Lime          | 2               | 1                 | 4                         | 5                    | X                           | 2                    | X                        | X                  | 1              | 1              | ◇                             | ◇                           | 5            |
| Acetic Acid, 30%         | 1               | 1                 | 3                         | 2                    | X                           | 2                    | 1                        | 4                  | 1              | X              | ◇                             | ◇                           | 5            |
| Acetic Acid, Glacial     | 2               | 2                 | 4                         | 4                    | 2                           | 3                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 3            |
| Acetic Acid, Hot         | 2               | X                 | X                         | 4                    | 2                           | X                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | 3            |
| Acetic Anhydride         | 4               | 2                 | 4                         | 4                    | 4                           | 3                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 2            |
| Acetic Ester             | 4               | 2                 | 4                         | X                    | X                           | 4                    | X                        | 4                  | 2              | 1              | ◇                             | ◇                           | 4            |
| Acetic Oxide             | 2               | 2                 | 4                         | 4                    | X                           | 3                    | X                        | 2                  | 5              | 1              | ◇                             | ◇                           | 5            |
| Acetoacetic Acid         | 2               | X                 | 4                         | 5                    | 3                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 5            |
| Acetone                  | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 4            |
| Acetone Cyanohydrin      | 2               | 1                 | 4                         | 5                    | 3                           | 4                    | 1                        | 4                  | 1              | X              | ◇                             | ◇                           | 5            |
| Acetonitrile             | 1               | 1                 | 4                         | 5                    | X                           | 3                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Acetophenone             | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Acetyl Acetone           | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Acetyl Acetonic          | 4               | 1                 | 4                         | X                    | X                           | 4                    | X                        | 4                  | X              | 1              | ◇                             | ◇                           | 5            |
| Acetyl Bromide           | 4               | 4                 | X                         | X                    | 4                           | 4                    | 1                        | 4                  | X              | X              | ◇                             | ◇                           | 2            |
| Acetyl Chloride          | 4               | 3                 | 1                         | 1                    | 4                           | 4                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Acetyl Oxide             | 2               | 2                 | 4                         | X                    | X                           | 3                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | 5            |
| Acetyl Propane           | 4               | 2                 | 4                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | 5            |
| Acetylene Tetrabromide   | 2               | 1                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Acetylene Tetracholoride | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | X                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Acetylene, Ga            | 2               | 1                 | 1                         | 3                    | 1                           | 1                    | 1                        | 2                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Acrolein                 | 3               | 1                 | 4                         | X                    | 3                           | 3                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 5            |
| Acrylic Acid             | X               | 3                 | 4                         | X                    | 2                           | 2                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 4            |
| Acrylonitrile            | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Adipic Acid              | 1               | 2                 | 2                         | 1                    | 1                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 2            |
| Aero Lubriplate          | 1               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | 1            |
| Aero Shell 17 Grease     | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | 1            |
| Auro Shell 1AC Grease    | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | 1            |
| Aero Shell 750 Grease    | 4               | 4                 | 1                         | 4                    | 1                           | 2                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | 1            |
| Aero Shell 7A Grease     | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | 1            |
| Aerosafe 2300            | 4               | 1                 | 4                         | 3                    | 4                           | 4                    | 1                        | 4                  | 3              | 2              | ◇                             | ◇                           | 2            |



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| Aerosafe 2300W                 | 4               | 1                 | 4                         | 3                    | 4                           | 4                    | 1                        | 4                  | 3              | 2              | ◇                             | ◇                           | 2            |
| Aerozene 50                    | 4               | 1                 | 4                         | 4                    | 2                           | 3                    | 2                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| Air, Below 200°F               | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Air, 200°F to 300°F            | 2               | 2                 | X                         | 1                    | 3                           | 2                    | X                        | 3                  | 1              | X              | ◇                             | ◇                           | 2            |
| Air, 400°F to 500°F            | 4               | 4                 | X                         | 4                    | 4                           | 4                    | X                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Aldehyde                       | 3               | 1                 | 4                         | X                    | X                           | 4                    | X                        | 3                  | 1              | X              | ◇                             | ◇                           | X            |
| Alkazene                       | 4               | 4                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 2            |
| Alkenes (Olefin Hyrdocarbons)  | 4               | 4                 | 2                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Alkyl Acetone                  | 1               | 1                 | 1                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Alkyl Alcohol                  | 4               | 4                 | 4                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Alkyl Amine                    | 4               | 4                 | 4                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Alkyl Aryl Sulfonics           | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Alkyl Benzene                  | 4               | 4                 | 2                         | 1                    | 2                           | 4                    | X                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Alkyl Chloride                 | 4               | 4                 | 2                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Alkyl Napthalene Sulfonic Acid | 4               | 4                 | 2                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Alkyl Sulfide                  | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Allyl Chloride                 | 4               | 4                 | 2                         | 4                    | 1                           | 2                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | 1            |
| Allylidene Diacetate           | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Alpha Picolene                 | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Aluminum Acetate               | 2               | 1                 | 4                         | 4                    | 2                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Aluminum Ammonium Sulphate     | 2               | 1                 | 1                         | 5                    | 1                           | 2                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Aluminum Bromide               | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Aluminum Chlorate              | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Aluminum Chloride              | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Aluminum Fluoride              | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Aluminum Formate               | X               | X                 | 4                         | X                    | 3                           | 4                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Aluminum Hydroxide             | 1               | 1                 | 1                         | 1                    | 2                           | 2                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Aluminum Linoleate             | X               | X                 | X                         | X                    | 1                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Aluminum Nitrate               | 2               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | 3                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Aluminum Oxalate               | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Aluminum Phosphate             | 1               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Aluminum Potassium Sulfate     | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | X            |
| Aluminum Salts                 | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Aluminum Sodium Sulfate        | 2               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | 1                  | 1              | X              | ◇                             | ◇                           | 2            |
| Aluminum Sulfate               | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |

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| Ambrex 33                             | 2               | 4                 | 1                         | 3                    | 1                           | 1                    | 1                        | 2                  | 4              | 2              | ◇                             | ◇                           | 1            |
| Ambrex 830                            | 2               | 3                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Amines                                | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | 2            |
| Aminoanthraquinone                    | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 3            |
| Aminoazobenzene                       | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Aminobenzoic Acid                     | X               | X                 | X                         | X                    | X                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Ammonia and Lithium in Metal Solution | 4               | 2                 | 4                         | 4                    | 2                           | 2                    | 4                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Ammonia Gas, Cold                     | 1               | 1                 | 4                         | 4                    | 2                           | 2                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Ammonia Gas, Hot                      | 1               | 1                 | 4                         | 4                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Ammonia Liquid                        | 4               | 2                 | 4                         | 4                    | 4                           | 2                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 2            |
| Ammonia, Anhydrous                    | 1               | 1                 | 4                         | 4                    | 2                           | 2                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 3            |
| Ammonium Acetate                      | 1               | 1                 | 4                         | X                    | 3                           | 1                    | 1                        | 3                  | X              | 1              | ◇                             | ◇                           | X            |
| Ammonium Alum                         | 1               | 2                 | 2                         | X                    | X                           | 2                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ammonium Arsenate                     | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Ammonium Benzoate                     | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ammonium Bicarbonate                  | 1               | 2                 | 4                         | X                    | 3                           | 1                    | 1                        | 3                  | X              | 1              | ◇                             | ◇                           | 1            |
| Ammonium Bifluoride                   | 4               | 1                 | 1                         | X                    | X                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ammonium Bromide                      | X               | X                 | X                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Ammonium Carbamate                    | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ammonium Carbonate                    | 2               | 1                 | 1                         | X                    | 4                           | 2                    | 1                        | 1                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Ammonium Chloride                     | 2               | 1                 | 1                         | 3                    | 1                           | 2                    | 1                        | 2                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Ammonium Chromic Sulfate              | 1               | X                 | X                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ammonium Dichromate                   | 1               | 1                 | X                         | X                    | 3                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ammonium Diphosphate                  | 1               | 1                 | 1                         | X                    | 3                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Ammonium Fluoride                     | 2               | 1                 | 1                         | X                    | 1                           | 2                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 2            |
| Ammonium Fluoride Acid                | 2               | X                 | X                         | X                    | 4                           | X                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ammonium Fluorosilicate               | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Ammonium Formate                      | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ammonium Hydrate                      | 1               | X                 | X                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ammonium Hydroxide                    | 3               | 1                 | 3                         | 1                    | 4                           | 4                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Ammonium Hyposulphite                 | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ammonium Iodide                       | X               | X                 | X                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Ammonium Lactate                      | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Ammonium Metaphosphate                | 1               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ammonium Molybdenate                  | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |



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| Ammonium Nitrate              | 1               | 1                 | 1                         | 3                    | 1                           | 1                    | 1                        | X                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Ammonium Nitrite              | 1               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 2            |
| Ammonium Oxalate              | 1               | 1                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Ammonium Perchlorate          | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Ammonium Persulfate           | 4               | 2                 | 1                         | 1                    | 4                           | 1                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Ammonium Phosphate            | 2               | 1                 | 1                         | 4                    | 1                           | 1                    | 1                        | 2                  | 1              | X              | ◇                             | ◇                           | 2            |
| Ammonium Phosphate, Dibasic   | 1               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Ammonium Phosphate, Monobasic | 1               | 1                 | 1                         | 4                    | 1                           | 1                    | X                        | 2                  | 1              | 1              | ◇                             | ◇                           | 2            |
| Ammonium Phosphate, Tribasic  | 3               | 1                 | 1                         | X                    | 1                           | 1                    | X                        | X                  | 1              | 1              | ◇                             | ◇                           | 2            |
| Ammonium Salts                | 1               | 1                 | 1                         | 3                    | 1                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Ammonium Sulfamate            | X               | X                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ammonium Sulfate              | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Ammonium Sulfide              | 1               | 1                 | 2                         | X                    | 1                           | 1                    | 1                        | 2                  | X              | 1              | ◇                             | ◇                           | 1            |
| Ammonium Sulfite              | 1               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ammonium Thiocyanate          | 1               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | 2                  | X              | X              | ◇                             | ◇                           | X            |
| Ammonium Thioglycolate        | X               | X                 | X                         | X                    | 3                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ammonium Thiosulfate          | 1               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ammonium Tungstate            | X               | X                 | 1                         | X                    | 3                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ammonium Valerate             | X               | X                 | X                         | X                    | 3                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Amyl Acetate                  | 4               | 1                 | 4                         | 4                    | 4                           | 1                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Amyl Acetic Ester             | 4               | 2                 | 4                         | X                    | X                           | X                    | X                        | X                  | 4              | 1              | ◇                             | ◇                           | X            |
| Amyl Acetone                  | X               | X                 | 4                         | X                    | X                           | X                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Amyl Alcohol                  | 2               | 1                 | 2                         | 1                    | 2                           | 1                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Amyl Borate                   | 1               | 4                 | 1                         | X                    | 1                           | 1                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Amyl Bromide                  | 4               | 4                 | 2                         | X                    | X                           | X                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Amyl Carbinol                 | 2               | 3                 | 2                         | X                    | 1                           | X                    | X                        | 4                  | 2              | 1              | ◇                             | ◇                           | X            |
| Amyl Chloride                 | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Amyl Chloronaphthalene        | 4               | 4                 | 1                         | 2                    | 4                           | 1                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Amyl Ether                    | X               | 4                 | X                         | X                    | X                           | X                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Amyl Hydrate                  | 2               | X                 | X                         | 1                    | X                           | X                    | X                        | X                  | 4              | 1              | ◇                             | ◇                           | X            |
| Amyl Hydride                  | 1               | 4                 | 1                         | 1                    | X                           | X                    | X                        | X                  | 4              | 1              | ◇                             | ◇                           | X            |
| Amyl Iodide                   | 4               | 4                 | X                         | X                    | 4                           | X                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Amyl Laurate                  | X               | X                 | 1                         | X                    | X                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Amyl Mercaptan                | 4               | 4                 | 1                         | 2                    | 2                           | 1                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Amyl Naphthalene              | 4               | 4                 | 1                         | 1                    | 4                           | 1                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |

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|-------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Amyl Nitrate            | X               | 2                 | X                         | X                    | 3                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Amyl Nitrite            | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Amyl Oleate             | X               | X                 | X                         | X                    | X                           | 2                    | X                        | X                  | 4              | 1              | ◇                             | ◇                           | X            |
| Amyl Phenol             | X               | X                 | X                         | X                    | X                           | 4                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Amyl Phthalate          | X               | X                 | 3                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Amyl Propionate         | X               | X                 | 2                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Amylene                 | 1               | 4                 | 1                         | X                    | X                           | 2                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| AN-0-3 Grade M          | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | 1            |
| AN-0-366                | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| AN-0-6                  | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| AN-VV-0-366B Hydraulic  | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | X                        | 3                  | 4              | X              | ◇                             | ◇                           | 1            |
| Anderol Diester         | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| ANG-25 (Diester Base)   | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | 2            |
| ANG-25 (Glyceral Ester) | 2               | 1                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | 2            |
| Aniline                 | 4               | 2                 | 2                         | 3                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Aniline Dyes            | 3               | 2                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 1            |
| Aniline Hydrochloride   | 4               | 2                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 1            |
| Aniline Oils            | 1               | 2                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | X              | ◇                             | ◇                           | 1            |
| Aniline Sulfate         | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Aniline Sulfite         | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Animal Fats (Lards)     | 3               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Animal Fats (Oils)      | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | X                        | 3                  | X              | 1              | ◇                             | ◇                           | 1            |
| Ansul Ether 161 or 181  | 4               | 3                 | 4                         | 3                    | 3                           | 3                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Anthracene              | X               | X                 | X                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Anthranilic Acid        | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Anthraquinone           | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Antifreeze Solutions    | 3               | 1                 | 2                         | 4                    | 3                           | 1                    | X                        | 4                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Antimony Chloride       | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Antimony Pentachloride  | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Antimony Pentafluoride  | X               | X                 | X                         | X                    | X                           | X                    | 2                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Antimony Salts          | 1               | 1                 | X                         | 1                    | X                           | 1                    | X                        | 1                  | 1              | X              | ◇                             | ◇                           | X            |
| Antimony Sulfate        | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Antimony Tribromide     | 3               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Antimony Trichloride    | 3               | 2                 | X                         | X                    | 1                           | 2                    | 1                        | 2                  | X              | X              | ◇                             | ◇                           | X            |
| Antimony Trifluoride    | X               | X                 | X                         | X                    | 1                           | X                    | 2                        | X                  | X              | X              | ◇                             | ◇                           | X            |



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| Antimony Trioxide        | 3               | 1                 | 1                         | X                    | X                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Antimony Trifluoride     | 3               | 1                 | 1                         | X                    | 1                           | 1                    | 2                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Apple Acid               | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 2              | 1              | ◇                             | ◇                           | X            |
| Aqua Regia               | 4               | 2                 | 1                         | 3                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Arachidic Acid           | X               | X                 | 2                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Argon                    | 4               | 1                 | 1                         | 2                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | 1            |
| Arochlor 1248            | 4               | 2                 | 1                         | 2                    | 3                           | 3                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | 1            |
| Arochlor 1254            | 4               | 2                 | 1                         | 1                    | 4                           | 4                    | 1                        | 4                  | 3              | X              | ◇                             | ◇                           | 1            |
| Arochlor 1260            | 1               | 2                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | X              | ◇                             | ◇                           | 1            |
| Aromatic Alcohol         | 3               | 3                 | 1                         | X                    | X                           | 3                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Aromatic Fuels           | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Aromatic Hydrocarbons    | 4               | 4                 | 1                         | 1                    | X                           | 4                    | 1                        | 3                  | 3              | 1              | ◇                             | ◇                           | 2            |
| Aromatic Spirits         | X               | X                 | 1                         | X                    | X                           | 3                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Aromatic Tar             | X               | X                 | 1                         | X                    | X                           | 3                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Aromatic Vinegar         | 2               | 1                 | 1                         | X                    | X                           | 3                    | X                        | 2                  | 1              | 1              | ◇                             | ◇                           | X            |
| Arsenic Acid             | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Arsenic Butter           | 1               | 4                 | 4                         | X                    | X                           | 3                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Arsenic Chloride         | 1               | 4                 | 4                         | X                    | X                           | 3                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Arsenic Salts            | X               | X                 | 2                         | X                    | X                           | X                    | X                        | 2                  | X              | 1              | ◇                             | ◇                           | X            |
| Arsenic Trichloride      | 1               | 4                 | 4                         | X                    | 1                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 4            |
| Arsenic Trioxide         | X               | X                 | X                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Arsenic Trisulfate       | X               | X                 | X                         | X                    | 1                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Arsine                   | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ascorbic Acid            | X               | X                 | 1                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Askarel Transformer Oil  | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Aspartic Acid            | X               | X                 | 3                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Asphalt                  | 3               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 2            |
| ASTM Method D-471-1      | X               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| ASTM Method D-471-2      | X               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| ASTM Method D-471-3      | X               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| ASTM Reference Fuel A    | 2               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 3            |
| ASTM Reference Fuel B    | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 4            |
| ASTM Reference Fuel C    | 4               | 4                 | 2                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| ASTM Reference Fuel D    | 4               | 4                 | 2                         | 1                    | 2                           | 3                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 4            |
| ASTM Reference Oil No. 1 | 1               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |



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| ASTM Reference Oil No. 2        | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 2            |
| ASTM Reference Oil No. 3        | 3               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 3              | 1              | ◇                             | ◇                           | 3            |
| ASTM Reference Oil No. 4        | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| ASTM Reference Oil No. 5        | X               | 4                 | 1                         | X                    | 1                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Astra Oil                       | 2               | 4                 | 1                         | X                    | X                           | 1                    | X                        | 3                  | 4              | 1              | ◇                             | ◇                           | X            |
| ATL-857                         | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| Atlantic Dominion F             | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | 2            |
| Atlantic Utro Gear-EP Lubricant | 2               | 4                 | X                         | X                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | 2            |
| Aurex 903R                      | 2               | 4                 | 1                         | 4                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Automatic Transmission FLuid    | 2               | 4                 | 1                         | X                    | 1                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Automotive Brake Fluid          | 2               | 1                 | 4                         | 4                    | 3                           | 3                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Aviation Gasoline               | 4               | 4                 | 4                         | 1                    | X                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Axarel 9100                     | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Azovenzene                      | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Baking Soda                     | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Bardol B                        | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Barium Carbonate                | 1               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | 2                  | X              | X              | ◇                             | ◇                           | 1            |
| Barium Chlorate                 | X               | X                 | 1                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Barium Chloride                 | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Barium Cyanide                  | 1               | 1                 | 1                         | X                    | 1                           | 3                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Barium Fluoride                 | 2               | 4                 | 3                         | X                    | X                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Barium Hydrate                  | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Barium Hydroxide                | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Barium Iodide                   | X               | X                 | X                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Barium Monohydrate              | 1               | X                 | X                         | 1                    | X                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | X            |
| Barium Monosulfide              | 1               | 1                 | X                         | X                    | X                           | 1                    | X                        | 1                  | 2              | 1              | ◇                             | ◇                           | X            |
| Barium Nitrate                  | 1               | 1                 | 1                         | 1                    | 3                           | 1                    | 1                        | 2                  | 2              | 1              | ◇                             | ◇                           | X            |
| Barium Oxide                    | X               | X                 | X                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Barium Peroxide                 | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Barium Polysulfide              | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Barium Salts                    | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Barium Sulfate                  | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Barium Sulfide                  | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Basic Iron Sulfate              | 1               | X                 | X                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Bayol 35                        | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | 1            |

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| Bayol D                | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| Beer                   | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Beet Sugar Liquids     | 2               | 1                 | X                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | X              | ◇                             | ◇                           | 1            |
| Beet Sugar Liquors     | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | X              | ◇                             | ◇                           | 1            |
| Benzal Alcohol         | 3               | X                 | 1                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Benzal Chloride        | X               | X                 | X                         | X                    | X                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Benzaldehyde           | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 2                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Benzanthrone           | X               | X                 | 2                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Benzene                | 4               | 4                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Benzene Carbinol       | 4               | 2                 | 4                         | X                    | X                           | 4                    | X                        | 4                  | 3              | 1              | ◇                             | ◇                           | X            |
| Benzene Hexachloride   | X               | X                 | 2                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Benzene Sulfonic Acid  | 2               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Benzidine              | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Benzil                 | X               | X                 | X                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Benzilic Acid          | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Benzine (Ligroin)      | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Benzochloride          | 4               | 1                 | X                         | 1                    | 4                           | 4                    | X                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Benzoic Acid           | 2               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Benzoin                | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Benzol                 | 4               | 4                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Benzonitrile           | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Benzophenone           | 4               | 2                 | 2                         | 1                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| Benzoquinone           | 4               | 2                 | 1                         | X                    | X                           | X                    | 1                        | 4                  | X              | X              | ◇                             | ◇                           | 2            |
| Benzotrichloride       | X               | 1                 | 1                         | X                    | 4                           | 4                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 3            |
| Benzotrifluoride       | X               | X                 | X                         | X                    | 4                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Benzoyl Chloride       | 4               | 4                 | 2                         | 2                    | X                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Benzoyl Peroxide       | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Benzoylsulfonic Acid   | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Benzyl Acetate         | X               | X                 | X                         | X                    | 3                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Benzyl Alcohol         | 4               | 2                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 2            |
| Benzyl Amine           | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Benzyl Benzoate        | 4               | 2                 | 1                         | 1                    | 4                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Benzyl Bromide         | X               | X                 | X                         | X                    | 4                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Benzyl Butyl Phthalate | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Benzyl Chloride        | 4               | 4                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |

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| Benzyl Phenol            | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Benzyl Salicylate        | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Beryllium Chloride       | X               | X                 | X                         | X                    | 4                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Beryllium Fluoride       | X               | X                 | X                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Beryllium Oxide          | X               | X                 | X                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Beryllium Sulfate        | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Beta Carotene            | 4               | X                 | 1                         | X                    | X                           | 1                    | X                        | 1                  | X              | X              | ◇                             | ◇                           | X            |
| Bismuth Carbonate        | 1               | 1                 | 1                         | X                    | 3                           | 1                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Bismuth Nitrate          | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Bismuth Oxychloride      | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Bittern                  | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Black Liquor             | 1               | 1                 | 1                         | X                    | 2                           | 1                    | 3                        | 4                  | 1              | 1              | ◇                             | ◇                           | 2            |
| Black Point 77           | 3               | 1                 | 1                         | 3                    | 1                           | 1                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | 1            |
| Black Sulfate Liquor     | 1               | 1                 | 1                         | 2                    | X                           | 1                    | X                        | X                  | 2              | 1              | ◇                             | ◇                           | X            |
| Blast-Furnace Gas        | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Bleach Liquor            | 4               | 1                 | 1                         | 2                    | 2                           | 4                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Bleach Solutions         | 4               | 1                 | X                         | 2                    | X                           | 4                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Blood                    | 1               | 1                 | 2                         | X                    | X                           | 3                    | X                        | 2                  | 2              | 1              | ◇                             | ◇                           | X            |
| Borax                    | X               | 1                 | 1                         | 2                    | 2                           | 2                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | 1            |
| Borax Solution           | 2               | 1                 | 1                         | 2                    | 1                           | 2                    | X                        | 1                  | 2              | 2              | ◇                             | ◇                           | X            |
| Bordeaux Mixture         | 2               | 1                 | 1                         | 2                    | 2                           | 1                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Boric Acid               | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Boric Oxide              | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Borneol                  | X               | X                 | 2                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Bornyl Acetate           | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Bornyl Chloride          | X               | X                 | X                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Bornyl Formate           | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Boron FLuids (HEF)       | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Boron Phosphate          | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Boron Tribromide         | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Boron Trichloride        | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Boron Trifluoride        | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Boron Trioxide           | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Brayco 885 (MIL-L-6085A) | 2               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | 2            |
| Brayco 910               | 2               | 1                 | 4                         | 4                    | 2                           | 2                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | 3            |



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| Bret 710                           | 2               | 1                 | X                         | 4                    | 2                           | 2                    | X                        | 3                  | 4              | X              | ◇                             | ◇                           | 2            |
| Brine                              | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | 1            |
| Brine Seawater                     | 3               | 2                 | X                         | 1                    | 1                           | 2                    | X                        | 2                  | 1              | X              | ◇                             | ◇                           | 1            |
| Brom - 113                         | 4               | 4                 | X                         | X                    | 3                           | 3                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | 3            |
| Brom - 114                         | 2               | 4                 | X                         | X                    | 2                           | 2                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | 3            |
| Bromic Acid                        | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Bromine                            | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| Bromine Anhydrous                  | 4               | 4                 | 1                         | 2                    | X                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Bromine Pentafluoride              | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 2                        | 4                  | 4              | X              | ◇                             | ◇                           | 4            |
| Bromine Trifluoride                | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 2                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Bromine Water                      | 4               | 2                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 3            |
| Bromobenzene                       | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Bromochloromethane                 | 4               | 2                 | 1                         | 2                    | X                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Bromotrifluoromethane (F-13B1)     | X               | 1                 | X                         | 2                    | X                           | 1                    | 2                        | X                  | 4              | X              | ◇                             | ◇                           | 3            |
| Buffered Oxide Etchants            | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Bunker Oil                         | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 2              | 1              | ◇                             | ◇                           | 2            |
| Bunker's "C" (Fuel Oil)            | 4               | 4                 | 1                         | 1                    | X                           | 1                    | X                        | 2                  | X              | X              | ◇                             | ◇                           | X            |
| Butadiene                          | 4               | 4                 | 3                         | 1                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Butane                             | 3               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 1                  | 4              | 4              | ◇                             | ◇                           | 2            |
| Butane, 2, 2-Dimethyl              | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Butanol (Butyl Alcohol)            | 2               | 2                 | X                         | 1                    | 1                           | 1                    | X                        | X                  | 2              | X              | ◇                             | ◇                           | 1            |
| Butene 2-Ethyl (1-Butene, 2-Ethyl) | 4               | 4                 | X                         | 3                    | 1                           | 1                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| Butter-Animal Fat                  | 3               | 1                 | X                         | 1                    | 1                           | 1                    | 1                        | 3                  | 2              | X              | ◇                             | ◇                           | 1            |
| Butyl Acetate                      | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| n-Butyl Acetate                    | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Butyl Acetyl Ricinoleate           | 2               | 1                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 1            |
| Butyl Acrylate                     | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | 4            |
| Butyl Alcohol                      | 1               | 2                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | 1            |
| n-butyl Alcohol                    | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 1            |
| tert-Butyl Alcohol                 | 2               | 2                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | 1            |
| Butyl Aldehyde                     | 3               | 2                 | 4                         | X                    | X                           | 4                    | X                        | 3                  | 3              | 1              | ◇                             | ◇                           | X            |
| Butyl Amine                        | 4               | 4                 | 4                         | 4                    | 1                           | 3                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Butyl Benzoate                     | 4               | 1                 | 1                         | 1                    | 3                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| n-Butyl Benzoate                   | 4               | 1                 | 1                         | 1                    | 3                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Butyl Benzyl Phthalate (BBP)       | X               | X                 | 3                         | X                    | X                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |

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| Butyl Butyrate           | 4               | 1                 | 1                         | 1                    | X                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| n-Butyl Butyrate         | 4               | 1                 | 1                         | 1                    | X                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| ter-Butyl Caltechol      | 2               | 2                 | X                         | 1                    | 4                           | 4                    | 1                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Butyl Carbitol           | 3               | 1                 | 2                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Butyl Cellosolve         | 4               | 2                 | 4                         | 4                    | 3                           | 3                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Butyl Cellosolve Acetate | X               | 2                 | 2                         | 2                    | 3                           | 4                    | 1                        | X                  | 2              | X              | ◇                             | ◇                           | 2            |
| Butyl Cellosolve Adipate | 4               | 2                 | X                         | 2                    | 4                           | 4                    | X                        | 4                  | 2              | X              | ◇                             | ◇                           | 2            |
| Butyl Chloride           | X               | X                 | X                         | X                    | 3                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Butyl Ether              | 4               | 3                 | 4                         | 3                    | 3                           | 3                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| n-Butyl Ether            | 4               | 3                 | 4                         | 3                    | 3                           | 3                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Butyl Lactate            | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Butyl Laurate            | X               | X                 | 2                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Butyl Mercaptan          | X               | 4                 | 4                         | X                    | 4                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 1            |
| tert-Butyl Mercaptan     | 4               | 4                 | X                         | X                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Butyl Oleate             | 4               | 2                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 2            |
| Butyl Oxalate            | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Butyl Stearate           | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 2                  | X              | X              | ◇                             | ◇                           | 2            |
| Butylene                 | 3               | 4                 | 1                         | 2                    | 4                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| Butyraldenhyde           | 4               | 3                 | 4                         | 4                    | 4                           | 4                    | 2                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Butyric Acid             | 4               | 2                 | 3                         | 2                    | 2                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Butyric Anhydride        | X               | X                 | X                         | X                    | 3                           | 3                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Butryl Chloride          | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Butyrolacetone           | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Butyroyl Chloride        | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cadmium Chloride         | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cadmium Cyanide          | 2               | 1                 | 1                         | 1                    | 1                           | 2                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 1            |
| Cadmium Nitrate          | X               | X                 | 2                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cadmium Oxide            | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cadmium Sulfate          | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cadmium Sulfide          | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcine Liquors          | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 1            |
| Calcium Acetate          | 2               | 1                 | 4                         | 4                    | 2                           | 2                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Calcium Aluminate        | X               | X                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Calcium Arsenate         | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Calcium Benzoate         | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |



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|--------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Calcium Bicarbonate      | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Calcium Bichromate       | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Calcium Bisulfide        | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Calcium Bisulfite        | 3               | 4                 | 1                         | 3                    | 1                           | 1                    | 1                        | 1                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Calcium Bromide          | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | X              | ◇                             | ◇                           | 1            |
| Calcium Carbide          | X               | X                 | 1                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Carbonate        | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Calcium Chlorate         | 2               | 1                 | X                         | X                    | 3                           | 1                    | 1                        | 2                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Chloride         | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Calcium Chromate         | X               | X                 | X                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Cyanamide        | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Cyanide          | 1               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Calcium Disulfate        | 3               | 1                 | 1                         | 1                    | X                           | 1                    | X                        | 1                  | 2              | 1              | ◇                             | ◇                           | X            |
| Calcium Fluoride         | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Calcium Hydrate          | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | 1                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Hydride          | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Calcium Hydrosulfide     | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Hydroxide        | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Calcium Hypochlorite     | 4               | 1                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Calcium Hypophosphite    | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Hydrogen Sulfite | X               | 4                 | 1                         | 1                    | X                           | 4                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | 1            |
| Calcium Lactate          | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Nitrate          | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Calcium Oxalate          | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Oxide            | 2               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | 1            |
| Calcium Permanganate     | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Peroxide         | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Phenosulfate     | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Phosphate        | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | X              | ◇                             | ◇                           | 1            |
| Calcium Propionate       | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Salts            | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Calcium Silicate         | 1               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 1            |
| Calcium Stearate         | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Sufamate         | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Sulfate          | 4               | 1                 | 2                         | X                    | 3                           | 1                    | 1                        | 2                  | X              | 1              | ◇                             | ◇                           | X            |

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| Calcium Sulfide        | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Calcium Sulfite        | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Calcium Thiocyanate    | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Thiosulfate    | 1               | 1                 | 1                         | 1                    | 2                           | 2                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Calcium Tungstate      | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Calcium Gluconate      | X               | X                 | X                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Caliche Liquors        | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Camphene               | X               | X                 | 2                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Camphor                | X               | 1                 | 2                         | X                    | 2                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Cane Sugar Liquors     | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Caproic Acid           | X               | X                 | 2                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Caproic Aldehyde       | X               | 2                 | 4                         | 4                    | X                           | X                    | 1                        | X                  | 2              | X              | ◇                             | ◇                           | 3            |
| Caprolactum            | X               | 1                 | 4                         | X                    | 1                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Carbamate              | 2               | 2                 | 1                         | 1                    | 3                           | 3                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Carbitol               | 2               | 2                 | 2                         | 2                    | 2                           | 2                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | 1            |
| Carbolic Acid (Phenol) | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Carbon Bisulfide       | 4               | 4                 | 1                         | 2                    | 4                           | X                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Carbon Dioxide, Dry    | 2               | 2                 | 1                         | 2                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Carbon Dioxide, Wet    | 2               | 2                 | 1                         | 2                    | 1                           | 1                    | 1                        | X                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Carbon Disulfide       | 4               | 2                 | 1                         | 2                    | 2                           | X                    | 1                        | X                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Carbon Fluorides       | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Carbon Monoxide        | 4               | 1                 | 1                         | 2                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Carbon Sulfide         | 1               | X                 | 4                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Carbon Tetrabromide    | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Carbon Tetrachloride   | 4               | 4                 | 1                         | 3                    | 2                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Carbon Tetrafluoride   | 4               | 2                 | X                         | X                    | 2                           | 4                    | X                        | 1                  | X              | X              | ◇                             | ◇                           | 2            |
| Carbonated Beverages   | 1               | 1                 | 1                         | 2                    | X                           | 1                    | X                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| Carbonic Acid          | 4               | 1                 | 1                         | 1                    | 1                           | 2                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Carbonic Anhydride     | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Casein                 | 2               | 1                 | 1                         | 1                    | 3                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | X            |
| Castor Oil             | 1               | 2                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Catsup                 | 2               | X                 | 1                         | X                    | X                           | 1                    | X                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Caustic Lime           | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Caustic Potash         | 4               | 1                 | 1                         | 3                    | 3                           | 2                    | 1                        | X                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Caustic Soda           | 1               | 1                 | 4                         | 2                    | 2                           | 2                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 1            |



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| Celloguard                | X               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | 1            |
| Cellosolve                | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| Cellosolve Acetate        | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 3            |
| Cellosolve Butyl          | 4               | 2                 | X                         | 4                    | 4                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Cellulose Acetate         | 4               | X                 | 4                         | X                    | 3                           | 2                    | 1                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Cellulube A60             | 4               | 2                 | 3                         | 3                    | 4                           | 4                    | 1                        | 4                  | 3              | X              | ◇                             | ◇                           | 2            |
| Cellutherm 2505A          | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| Cement, Portland          | X               | 1                 | 1                         | X                    | X                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Cerium Sulfate            | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Cerous Chloride           | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Cerous Fluoride           | 1               | 1                 | X                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Cerous Nitrate            | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Cetane (Hexadecane)       | 2               | 4                 | 1                         | 3                    | 1                           | 1                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Cetyl Alcohol             | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Chassis Grease            | 3               | 4                 | X                         | X                    | X                           | 1                    | X                        | X                  | 4              | 1              | ◇                             | ◇                           | X            |
| Chaulmoogric Acid         | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| China Wood Oil            | 2               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Chloral                   | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chloramine                | X               | X                 | 4                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chloranthraquinone        | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Chlordane                 | 3               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Chlorextol                | 2               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| Chloric Acid              | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chloride/Chlorate of Lime | 4               | 1                 | 1                         | 1                    | 2                           | 3                    | 1                        | 3                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Chlorinated Napthalene    | X               | 4                 | 2                         | 2                    | X                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 4            |
| Chlorianted Salt Brine    | 4               | 4                 | 1                         | 1                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Chlorine (Wet)            | 4               | X                 | 1                         | 2                    | 3                           | X                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 3            |
| Chlorine Dioxide          | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 2                        | 4                  | 3              | 1              | ◇                             | ◇                           | 3            |
| Chlorine Trifluoride      | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 2                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Chlorine Water            | 4               | 3                 | 1                         | X                    | 3                           | 3                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| Chloroacetic Acid         | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 2            |
| Chloroacetone             | 3               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Chloroacetonitrile        | 3               | X                 | X                         | X                    | X                           | 3                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chloroacetyl Chloride     | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| m-Chloroaniline           | X               | 2                 | X                         | X                    | X                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |

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| Chlorobenzene                       | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Chlorobenzene Chloride              | X               | X                 | X                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chlorobenzol                        | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | X            |
| m-Chlorobenzotrifluoride            | X               | 4                 | X                         | 2                    | X                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Chlorobromomethane                  | 4               | 2                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Chlorobromopropane                  | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Chlorobutadiene                     | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Chlorobutane (Butyl Chloride)       | X               | X                 | 1                         | X                    | 1                           | 4                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chlorododecane                      | 4               | 4                 | 1                         | 1                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Chloroethane                        | 4               | 1                 | 1                         | 1                    | 1                           | 1                    | X                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Chloroethanoic Acid                 | 4               | 1                 | 2                         | 4                    | 4                           | 4                    | X                        | X                  | 2              | X              | ◇                             | ◇                           | X            |
| Chloroethanol                       | 2               | 2                 | 1                         | 2                    | 4                           | 4                    | 1                        | X                  | 3              | 1              | ◇                             | ◇                           | X            |
| Chloroethyl Alcohol                 | 2               | 1                 | 1                         | 2                    | 4                           | 4                    | 1                        | X                  | 3              | 1              | ◇                             | ◇                           | X            |
| Chloroethyl Benzene                 | 4               | 4                 | 1                         | 2                    | X                           | 4                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | X            |
| Chloroform                          | 4               | 4                 | 2                         | 3                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Chlorohydrin                        | X               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Chloromethane                       | 4               | 3                 | 2                         | 2                    | X                           | 3                    | X                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Chloromethyl Ether                  | 4               | 3                 | 4                         | 4                    | X                           | 4                    | X                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| o-Chloronapthalene                  | 4               | 4                 | X                         | 2                    | 4                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Chloronapthalene                    | 4               | 4                 | X                         | 2                    | 4                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Chloropentafluoroethane             | X               | 1                 | 1                         | X                    | X                           | 1                    | 2                        | X                  | X              | X              | ◇                             | ◇                           | 4            |
| Chloropentane                       | 4               | 4                 | 1                         | 2                    | 1                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | X            |
| o-Chlorophenol                      | 4               | 4                 | 1                         | 2                    | X                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Chloropicrin                        | X               | X                 | 1                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chloroprene                         | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Chloropropene                       | 4               | 4                 | 1                         | 4                    | 1                           | 2                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Chloropropylene                     | 4               | X                 | 1                         | 4                    | 1                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | X            |
| Chlorosilane                        | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chlorosulfonic Acid                 | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 4            |
| Chlorotoluene                       | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Chlorotriflourethylene              | X               | X                 | X                         | X                    | X                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chlorox (Sodium Hypochlorite NaOCl) | 2               | 2                 | 1                         | 1                    | 2                           | 2                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Cholestrol                          | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chrome Alum                         | 2               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 3            |
| Chrome Plating Solution             | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 1            |

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|-------------------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Chromic Acid                        | 4               | 2                 | 1                         | 3                    | 4                           | 4                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Chromic Chloride                    | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chromic Fluorides                   | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chromic Hydroxide                   | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chromic Nitrates                    | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chromic Oxide                       | 4               | 2                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 1            |
| Chromic Phosphate                   | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chromic Sulfate                     | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Chromium Potassium Sulfate (Alum)   | 2               | 2                 | 1                         | X                    | X                           | 1                    | 1                        | 2                  | 1              | X              | ◇                             | ◇                           | 2            |
| Chromyl Chlorides                   | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cinnamic Acid                       | X               | X                 | 1                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cinnamic Alcohol                    | X               | X                 | 1                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cinnamic Aldehyde                   | X               | X                 | 3                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Circo Light Process Oil             | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Citric Acid                         | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Citrous Oils                        | 4               | 2                 | 1                         | X                    | X                           | 1                    | X                        | X                  | 3              | 1              | ◇                             | ◇                           | X            |
| City Service 65, 120, 250           | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 1            |
| City Service Kool Motor Oil No. 140 | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| City Service Pacemaker No. 2        | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | 2              | ◇                             | ◇                           | 1            |
| Clorinated Solvents                 | 4               | 4                 | 1                         | 1                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Clorine (Dry)                       | 4               | X                 | 1                         | 1                    | 3                           | X                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 3            |
| Clorobenzene Triflouride            | X               | X                 | X                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Clorox                              | X               | 2                 | 1                         | 2                    | X                           | 2                    | 1                        | X                  | 2              | X              | ◇                             | ◇                           | X            |
| Coal Tar (Creosote)                 | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | 1            |
| Cobalt Chloride                     | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 2              | X              | ◇                             | ◇                           | 1            |
| Cobaltous Aceate                    | X               | X                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cobaltous Bromide                   | X               | X                 | X                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Cobatoous Linoleate                 | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cobaltous Sulfate                   | X               | X                 | 1                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Coconut Oil                         | 4               | 2                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 1              | X              | ◇                             | ◇                           | 2            |
| Cod Liver Oil                       | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Coffee                              | 1               | 1                 | X                         | X                    | 1                           | 1                    | X                        | 4                  | X              | X              | ◇                             | ◇                           | 1            |
| Coke Over Gas                       | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 2              | 3              | ◇                             | ◇                           | 2            |
| Coliche Liquors                     | 1               | 2                 | X                         | X                    | 2                           | 2                    | X                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Convelex 10                         | 4               | 3                 | 1                         | X                    | 4                           | 4                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 2            |

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|-------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Coolanol                | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Coolanol 25,45          | 4               | 3                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 2            |
| Copper Aceate           | 2               | 1                 | 4                         | 4                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Copper Ammonium Aceate  | 3               | 1                 | 4                         | 4                    | 3                           | 2                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 4            |
| Copper Arsenate         | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Copper Borofluoride     | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Copper Carbonate        | X               | 1                 | X                         | X                    | 3                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Copper Chloride         | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Copper Cyanide          | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 2            |
| Copper Fluoride         | X               | 1                 | 1                         | X                    | X                           | X                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Copper Gluconate        | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Copper Hydrate          | X               | X                 | 3                         | X                    | X                           | 2                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Copper Nitrate          | 2               | 2                 | 1                         | X                    | 1                           | 2                    | 1                        | 2                  | X              | 1              | ◇                             | ◇                           | 2            |
| Copper Oxide            | X               | X                 | X                         | X                    | 1                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Copper Plating Solution | 1               | 1                 | 1                         | 3                    | X                           | 1                    | X                        | 4                  | 3              | X              | ◇                             | ◇                           | X            |
| Copper Salts            | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Copper Sulfate          | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Copper Sulfate 10%      | 2               | 1                 | X                         | X                    | 1                           | 1                    | X                        | 2                  | X              | X              | ◇                             | ◇                           | 1            |
| Copper Sulfate 50%      | 2               | 1                 | X                         | X                    | 1                           | 1                    | X                        | 3                  | X              | X              | ◇                             | ◇                           | 1            |
| Copper Sulfide          | X               | X                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Corn Oil                | 3               | 3                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Cottonseed Oil          | 3               | 3                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Creosote (Coal Tar)     | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | 1            |
| Creosote (Wood Tar)     | 3               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 3                  | X              | X              | ◇                             | ◇                           | 2            |
| Cresol (Methyl Phenol)  | 4               | 4                 | 1                         | 2                    | 3                           | 4                    | 1                        | 4                  | X              | X              | ◇                             | ◇                           | 1            |
| Cresols                 | 4               | 4                 | X                         | 2                    | 4                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Cresylic Acids          | 4               | 4                 | 1                         | 2                    | 1                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Crotonaldehyde          | 4               | 1                 | 4                         | 2                    | X                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Crotonic Acid           | X               | 2                 | 2                         | 4                    | 2                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Crude Oil Sour          | 3               | X                 | X                         | X                    | 2                           | X                    | X                        | 2                  | X              | 1              | ◇                             | ◇                           | 2            |
| Crude Oil, Asphalt Base | 3               | 4                 | 1                         | 2                    | 1                           | 2                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Cumene                  | 2               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Cupric Acetate          | 2               | 1                 | X                         | X                    | X                           | 2                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Cupric Arsenate         | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Cupric Carbonate        | 1               | X                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |

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| Cupric Chloride         | X               | 1                 | 1                         | X                    | X                           | 1                    | X                        | 1                  | X              | 1              | ◇                             | ◇                           | X            |
| Cupric Cyanide          | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Cupric Fluoride         | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Cupric Hydroxide        | X               | X                 | 3                         | X                    | X                           | 2                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Cupric Nitrate          | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Cupric Nitrite          | X               | X                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Cupric Sulfate          | 2               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Cupric Sulfide          | X               | X                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Cutting Oil             | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Cyanide                 | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cyanamide               | X               | X                 | 1                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cyanogen Chloride       | X               | 3                 | 2                         | X                    | X                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 3            |
| Cyclohexane             | 4               | 4                 | 1                         | 2                    | 1                           | 2                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Cyclohexanol            | 2               | 4                 | 1                         | 1                    | 1                           | 2                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Cyclohexanone           | 4               | 3                 | 4                         | 4                    | 4                           | 4                    | 2                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Cyclohexene             | X               | X                 | 3                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cyclohexylamine         | 4               | 1                 | 4                         | 4                    | 1                           | 3                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Cyclohexylamine Laurate | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Cyclopentadiene         | X               | X                 | 3                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cyclopentane            | 1               | 4                 | 1                         | X                    | 1                           | 2                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 2            |
| Cyclopentanol           | X               | X                 | 2                         | X                    | X                           | 2                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Cyclopolyolefins        | 4               | 4                 | 4                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 2            |
| Cymene                  | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Decalin                 | 4               | 4                 | 1                         | 1                    | 4                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 2            |
| n-Decane                | 3               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Decane                  | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 2              | X              | ◇                             | ◇                           | 2            |
| Degreasing Fluid        | X               | 4                 | X                         | X                    | X                           | 4                    | X                        | 1                  | X              | 1              | ◇                             | ◇                           | X            |
| Dehydrated Alcohol      | 1               | 1                 | 2                         | X                    | X                           | 1                    | X                        | 4                  | 1              | 1              | ◇                             | ◇                           | X            |
| Deionized Water         | 2               | 1                 | 1                         | X                    | X                           | 2                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 2            |
| Delco Brake Fluid       | 2               | 1                 | 4                         | 4                    | 3                           | 3                    | 1                        | X                  | 3              | X              | ◇                             | ◇                           | 1            |
| Denatured Alcohol       | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Detergen Solutions      | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Developing Fluids       | 2               | 2                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Dextrin                 | 1               | 1                 | 1                         | X                    | 1                           | 1                    | X                        | 1                  | X              | X              | ◇                             | ◇                           | X            |
| Dextron                 | 2               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 1            |



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|----------------------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Dextrose                               | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | X                        | 1                  | 1              | X              | ◇                             | ◇                           | X            |
| Diacetone                              | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Diacetone Alcohol                      | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | X              | X              | ◇                             | ◇                           | 2            |
| Diamylamine                            | 4               | 1                 | 4                         | 4                    | 1                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Diazinon                               | X               | 4                 | 2                         | 2                    | 3                           | 3                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 2            |
| Dibenzyl Ether                         | 4               | 3                 | 4                         | X                    | 4                           | 4                    | 1                        | 2                  | X              | 1              | ◇                             | ◇                           | 3            |
| Dibenzyl Sebacate                      | 4               | 2                 | 2                         | 3                    | 4                           | 4                    | 1                        | 2                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Dibromoethyl Benzene (Alkazene)        | 4               | 4                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Dibromotetrafluoroethane (Freon 114B2) | 2               | 4                 | 2                         | X                    | X                           | 2                    | 2                        | X                  | 4              | X              | ◇                             | ◇                           | 4            |
| Dibutyl Cellosolve Adipate             | 4               | 1                 | X                         | 4                    | 3                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Dibutyl Ether                          | 4               | 3                 | 3                         | 3                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Dibutyl Phthalate (DBP)                | 4               | 1                 | 3                         | 3                    | 4                           | 4                    | 1                        | 3                  | 2              | 1              | ◇                             | ◇                           | 3            |
| Dibutyl Sebacate (DBS)                 | 4               | 2                 | 4                         | 2                    | 4                           | 4                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 2            |
| Dichlorobenzene                        | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| o-Dichlorobenzene                      | 4               | 4                 | 1                         | 2                    | X                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Dichlorobutane                         | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Dichlorobutene                         | X               | X                 | 1                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Dichloroacetic Acid                    | X               | X                 | 4                         | X                    | 2                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Dichlorodifluoromethane (Freon 12)     | 3               | 2                 | 2                         | 4                    | 1                           | 1                    | 2                        | 1                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Dichloroethane                         | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Dichloroethylene                       | 4               | 4                 | 1                         | 4                    | 2                           | 4                    | 1                        | 3                  | X              | 1              | ◇                             | ◇                           | X            |
| Dichlorofluoromethane (Freon 21)       | 4               | 4                 | 4                         | X                    | X                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Dichlorohexane                         | X               | X                 | 1                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Dichlorohydrin                         | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Dichloroisopropyl Ether                | 4               | 3                 | 3                         | 3                    | 4                           | 4                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Dichloromethane                        | 4               | 3                 | 3                         | 2                    | 2                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Dichloropentane                        | 4               | 4                 | 1                         | 3                    | X                           | 4                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Dichloropropane                        | 4               | 4                 | 1                         | 2                    | 2                           | 4                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Dichloropropene                        | X               | X                 | 2                         | X                    | 2                           | X                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Dichlorotetrafluoroethane (Freon 114)  | 1               | 4                 | 2                         | 2                    | 1                           | 1                    | 2                        | 1                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Dicyclohexylamine                      | 4               | 4                 | 4                         | 4                    | 3                           | 3                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Dieldrin                               | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Diesel Oil                             | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Diester Lubricant (MIL-L-7808)         | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Diester Synthetic Lubricating Oils     | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |



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| Diethanolamine (DEA)               | 4               | 1                 | X                         | 4                    | 3                           | X                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Diethyl Amine                      | 2               | 2                 | 4                         | 4                    | X                           | 3                    | 1                        | 3                  | 2              | X              | ◇                             | ◇                           | 4            |
| Diethyl Aniline                    | 4               | 1                 | X                         | 4                    | 3                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Diethyl Benzene                    | 4               | 4                 | 1                         | 3                    | X                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 3            |
| Diethyl Carbinol                   | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | 3                  | 4              | 1              | ◇                             | ◇                           | X            |
| Diethyl Carbonate                  | 4               | 3                 | 1                         | 2                    | 3                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Diethyl Ether                      | 4               | 4                 | 4                         | 3                    | 4                           | 4                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Diethyl Formaldehyde               | 4               | 1                 | 4                         | 4                    | X                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Diethyl Hydrazine                  | 3               | 1                 | 4                         | 4                    | X                           | 3                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Diethyl Ketone                     | 4               | 2                 | 4                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Diethyl Oxide                      | 3               | 4                 | X                         | X                    | X                           | 2                    | X                        | 1                  | X              | 4              | ◇                             | ◇                           | X            |
| Diethyl Phthalate                  | X               | 2                 | 2                         | 2                    | 2                           | 4                    | 1                        | X                  | 3              | 1              | ◇                             | ◇                           | 2            |
| Diethyl Sebacate                   | 4               | 2                 | 2                         | 2                    | 3                           | 4                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 2            |
| Diethyl Sulfate                    | 1               | 1                 | 4                         | 3                    | X                           | 4                    | 1                        | 4                  | 1              | X              | ◇                             | ◇                           | 2            |
| Diethylene Glycol                  | 1               | 1                 | 4                         | 1                    | 1                           | 1                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | 1            |
| Difluorodibromomethane             | 4               | 2                 | X                         | X                    | 4                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Difluoroethane (Freon 152)         | X               | 1                 | 4                         | X                    | 2                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 4            |
| Diglycol Chloroformate             | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Diglycolic Acid                    | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Dihydroxydiphenylsulfone           | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Diisobutyl Carbinol                | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Dissobutyl Ketone                  | 4               | 1                 | 4                         | 4                    | X                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Diisobutylene                      | 4               | 4                 | 4                         | 3                    | 1                           | 1                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Diisooctyl Adipate                 | X               | X                 | 3                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Diisooctyl Phthalate               | 4               | 1                 | 3                         | X                    | X                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Diisooctyl Sebacate (DISO)         | 4               | 3                 | 2                         | 3                    | 4                           | 3                    | 1                        | 4                  | 3              | X              | ◇                             | ◇                           | 2            |
| Diisoprene                         | 4               | 4                 | 1                         | X                    | X                           | 3                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Diisopropyl Amine                  | X               | X                 | X                         | X                    | X                           | 2                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Diisopropyl Benzene                | 4               | 4                 | 1                         | 2                    | 2                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Diisopropyl Ether (DIPE)           | 4               | 4                 | 1                         | 3                    | 2                           | 2                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Diisopropyl Ketone                 | 4               | 1                 | 4                         | 4                    | X                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Diisopropylidene Acetone (Phorone) | X               | 3                 | 4                         | 4                    | 2                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Dilaurel Ether                     | X               | X                 | X                         | X                    | X                           | 2                    | X                        | 2                  | 4              | 1              | ◇                             | ◇                           | X            |
| Dimethyl Acetamide                 | X               | X                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Dimethyl Aniline (Xylidine)        | 4               | 2                 | 4                         | 4                    | 2                           | 3                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |



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| Dimethyl Benzene             | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Dimethyl Carbinol            | 1               | 2                 | 1                         | X                    | X                           | 2                    | X                        | 4                  | 1              | 1              | ◇                             | ◇                           | X            |
| Dimethyl Ether               | 3               | 2                 | 4                         | 1                    | 1                           | 4                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | 4            |
| Dimethyl Fomaldehyde         | X               | X                 | 4                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Dimethyl Formamide (DMF)     | 4               | 2                 | 4                         | 4                    | 2                           | 3                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 2            |
| Dimethyl Hydrazine           | X               | X                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Dimethyl Ketone              | 3               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 4            |
| Dimethyl Methane             | 2               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | X            |
| Dimethyl Phenol              | X               | X                 | 4                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Dimethyl Phenyl Carbinol     | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Dimethyl Phenyl Methanol     | 4               | 4                 | X                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Dimethyl Phthalate (DMP)     | 4               | 2                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 2            |
| Dimethyl Sulfoxide (DMSO)    | 2               | 1                 | X                         | X                    | 3                           | 3                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 4            |
| Dimethyl Terephthalate (DMT) | 4               | 3                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Dinitrichlorobenzene         | 4               | 4                 | X                         | 2                    | 2                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Dinitrotoluene (DNT)         | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Diethyl Adipate              | 4               | 2                 | 3                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Diethyl Amine                | 4               | 1                 | 4                         | 4                    | X                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Diethyl Phthalate            | 4               | 2                 | 4                         | 2                    | 4                           | 4                    | 1                        | 4                  | 3              | X              | ◇                             | ◇                           | 2            |
| Diethyl Sebacate             | 4               | 2                 | 1                         | 3                    | 4                           | 4                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | 2            |
| Dioxane                      | 4               | 2                 | 4                         | 4                    | 2                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Dioxolane                    | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Dipentene                    | 4               | 4                 | 1                         | 3                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Diphenyl (Biphenol)          | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Diphenyl Oxide               | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 2            |
| Diphenylamine (DPA)          | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Diphenylene Oxide            | X               | X                 | 1                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Diphenylpropane              | X               | X                 | 2                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Dodecyl Benzene              | X               | X                 | 1                         | X                    | 2                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Dow Chemical 50-4            | 3               | 1                 | 4                         | 4                    | 3                           | 3                    | 2                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Dow Chemical ET378           | 4               | 3                 | 3                         | X                    | 4                           | 4                    | 2                        | 2                  | 4              | X              | ◇                             | ◇                           | 3            |
| Dow Corning 1208, 4050, 6620 | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | X              | ◇                             | ◇                           | 1            |
| Dow Corning 3, 4, 11         | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | 1            |
| Dow Corning 5, 33, 44        | 1               | 1                 | 1                         | 2                    | 1                           | 1                    | 1                        | 1                  | 3              | 2              | ◇                             | ◇                           | 1            |
| Dow Corning 55               | 1               | 1                 | 1                         | 2                    | 1                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | 1            |





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| Dow Corning F-61               | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| DowGuard                       | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 1              | X              | ◇                             | ◇                           | 1            |
| DowTherm 209                   | 2               | 1                 | 1                         | 3                    | 3                           | 3                    | 1                        | X                  | 3              | X              | ◇                             | ◇                           | 1            |
| DowTherm A                     | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| DowTherm E                     | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| DowTherm Oil                   | 4               | 4                 | 3                         | 1                    | X                           | X                    | X                        | 2                  | 2              | 1              | ◇                             | ◇                           | X            |
| DowTherm S.R.-1                | X               | X                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Drinking Water                 | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Dry Cleaning Fluids            | 4               | 4                 | 1                         | 2                    | 3                           | 3                    | 2                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| DTE Light Oil                  | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 3              | 2              | ◇                             | ◇                           | 1            |
| Dyes, Abrasive                 | 3               | X                 | 1                         | X                    | X                           | 4                    | X                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Dyes, Water Based              | 2               | X                 | 1                         | X                    | X                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Elco 28 EP Lubricant           | 3               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | 1            |
| Enamel                         | 1               | X                 | X                         | X                    | X                           | 1                    | X                        | 1                  | X              | X              | ◇                             | ◇                           | X            |
| Epichlorohydrin                | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 2                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Epoxy Resins                   | 1               | 1                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Esam-6 Fluid                   | 2               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 4            |
| Esso Fuel 208                  | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| Esso Golden Gasoline           | 4               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 3            |
| Esso Motor Oil                 | 3               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| Esso Transmission Fluid Type A | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | 1            |
| Esso WS2812 (MIL-L7808A)       | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Esso XP90-EP Lubricant         | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Esstic 42, 43                  | 2               | 4                 | 1                         | 4                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 1            |
| ETBE (Ethyl tert-Butyl Ether)  | 3               | 3                 | 1                         | X                    | 3                           | 3                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Ethane                         | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Ethanethiol                    | 4               | 3                 | 2                         | 2                    | X                           | 4                    | 1                        | X                  | 3              | 1              | ◇                             | ◇                           | X            |
| Ethanol                        | 2               | 1                 | X                         | 1                    | 1                           | 1                    | X                        | X                  | 2              | X              | ◇                             | ◇                           | X            |
| Ethanolamine (MEA)             | 2               | 2                 | 4                         | 4                    | 2                           | 2                    | 1                        | 3                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Ether                          | 4               | 4                 | 4                         | 3                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Ethyl Acetate                  | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 4            |
| Ethyl Acetic Acid              | 3               | 3                 | 3                         | X                    | X                           | 3                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Acetoacetate             | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 4            |
| Ethyl Acetylene                | X               | X                 | X                         | X                    | X                           | X                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Acrylate                 | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 3            |



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|-------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Ethyl Acrylic Acid      | 2               | 2                 | 4                         | 4                    | X                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Ethyl Alcohol (Ethanol) | 2               | 1                 | 2                         | 1                    | 1                           | 1                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Ethyl Aldehyde          | 3               | 1                 | 4                         | X                    | X                           | 4                    | X                        | 3                  | 1              | 1              | ◇                             | ◇                           | X            |
| Ethyl Amine             | 4               | 1                 | 4                         | 4                    | 3                           | 4                    | 1                        | X                  | 3              | 1              | ◇                             | ◇                           | X            |
| Ethyl Benzene           | 4               | 4                 | 1                         | 1                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Ethyl Benzoate          | 4               | 4                 | 1                         | 1                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Ethyl Bromide           | 4               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Ethyl Butanol           | X               | X                 | 2                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Butyl Acetate     | X               | X                 | 4                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Butyl Alcohol     | 1               | X                 | 2                         | X                    | X                           | X                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Butyl Amine       | X               | X                 | X                         | X                    | X                           | 2                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Butyl Ketone      | X               | X                 | X                         | X                    | X                           | X                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Butyrate          | 4               | 4                 | 1                         | X                    | X                           | X                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Cellosolve        | 4               | 2                 | 4                         | X                    | 4                           | 2                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Ethyl Cellulose         | 2               | 2                 | 4                         | 4                    | 2                           | 2                    | 1                        | 2                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Ethyl Chloride          | 4               | 3                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Ethyl Chlorocarbonate   | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Ethyl Chloroformate     | 4               | 4                 | X                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Ethyl Cyanide           | 3               | 4                 | 4                         | X                    | 4                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 1            |
| Ethyl Diacetate         | 4               | X                 | X                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Dichloride        | 4               | 3                 | 2                         | 1                    | X                           | 4                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | X            |
| Ethyl Ether             | 4               | 4                 | 4                         | 3                    | 3                           | 4                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | 4            |
| Ethyl Formate           | 2               | 2                 | 1                         | 1                    | 4                           | 4                    | 2                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Ethyl Formic Ester      | 2               | 2                 | 3                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Hexanol           | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Ethyl Hexyl Acetate     | X               | X                 | 4                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Hexyl Alcohol     | 1               | 1                 | 1                         | 1                    | X                           | 1                    | X                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Ethyl Hydrate           | 1               | 1                 | 2                         | X                    | X                           | 1                    | X                        | 4                  | 1              | 1              | ◇                             | ◇                           | X            |
| Ethyl Hydroxide         | 2               | X                 | X                         | X                    | X                           | 2                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Iodide            | 4               | 3                 | 2                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Lactate           | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ethyl Mercaptan         | 4               | X                 | 2                         | X                    | 4                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| Ethyl Nitrite           | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ethyl Orthosilicate     | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Oxalate           | 4               | 1                 | 1                         | 2                    | 4                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |

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| Ethyl Oxide                        | 4               | 4                 | 4                         | X                    | X                           | 2                    | X                        | 3                  | 3              | 1              | ◇                             | ◇                           | X            |
| Ethyl Pentachlorobenzene           | 4               | 4                 | 1                         | 2                    | 4                           | 1                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Ethyl Phthalate                    | X               | X                 | 3                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Propionate                   | 4               | 4                 | X                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethyl Pyridene                     | 4               | 1                 | 4                         | 4                    | X                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Ethyl Silicate                     | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Ethyl Stearate                     | X               | X                 | X                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ethyl Sulfate                      | 1               | 1                 | X                         | 3                    | X                           | 1                    | X                        | 4                  | 1              | X              | ◇                             | ◇                           | 1            |
| Ethyl Vaterate                     | X               | X                 | X                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ethylamine                         | X               | X                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ethylcyclopentane                  | 3               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 2            |
| Ethylene                           | 3               | 2                 | 1                         | 1                    | 2                           | 1                    | 1                        | 2                  | X              | 1              | ◇                             | ◇                           | 1            |
| Ethylene Alcohol                   | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | 2                  | 1              | 1              | ◇                             | ◇                           | X            |
| Ethylene Bromide                   | 4               | 2                 | 1                         | X                    | X                           | 4                    | X                        | 4                  | X              | 1              | ◇                             | ◇                           | X            |
| Ethylene Chloride                  | 4               | 4                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Ethylene Chlorohydrin              | 2               | 2                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Ethylene Cyanohydrin               | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ethylene Diamine                   | 1               | 1                 | 4                         | 4                    | 1                           | 2                    | 2                        | 4                  | 1              | X              | ◇                             | ◇                           | 2            |
| Ethylene Dibromide                 | 4               | 3                 | 1                         | 3                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Ethylene Dichloride                | 4               | 4                 | 1                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Ethylene Glycol                    | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Ethylene Glycol Butyl Ether        | 3               | 2                 | 4                         | 4                    | 1                           | 3                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Ethylene Hydrochloride             | 4               | 3                 | 1                         | 3                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Ethylene Oxide                     | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Ethylene Trichloride               | 4               | X                 | 1                         | 3                    | 4                           | 4                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 4            |
| F-60 Fluid                         | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| F-61 Fluid                         | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Fatty Acids                        | 4               | 3                 | 1                         | 1                    | 2                           | 1                    | 1                        | 2                  | 3              | 1              | ◇                             | ◇                           | 1            |
| FC-43 Heptacosofluorotributylamine | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 4                        | X                  | 1              | X              | ◇                             | ◇                           | 3            |
| FC75 & FC77 (Fluorocarbon)         | 1               | 1                 | 2                         | 2                    | 1                           | 1                    | 4                        | X                  | 1              | X              | ◇                             | ◇                           | 3            |
| Ferric Acetate                     | X               | X                 | 4                         | X                    | 3                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | X            |
| Ferric Ammonium Sulfate            | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ferric Chloride                    | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | 1            |
| Ferric Hydroxide                   | 2               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ferric Nitrate                     | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 3              | 1              | ◇                             | ◇                           | 1            |

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| Ferric Persulfate                  | 2               | X                 | X                         | X                    | 1                           | 1                    | X                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Ferric Sulfate                     | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | 1            |
| Ferrous Ammonium Citrate           | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Ferrous Ammonium Sulfate           | 1               | X                 | 2                         | X                    | 3                           | X                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ferrous Carbonate                  | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Ferrous Chloride                   | 2               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | 2                  | 3              | 1              | ◇                             | ◇                           | X            |
| Ferrous Hydroxide                  | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ferrous Nitrate                    | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Ferrous Salts                      | 1               | 1                 | 1                         | X                    | X                           | 2                    | 1                        | 2                  | X              | 1              | ◇                             | ◇                           | X            |
| Ferrous Sulfate                    | 2               | 1                 | 1                         | 1                    | 3                           | 1                    | 1                        | 1                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Ferrous Sulfide                    | X               | X                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | 1            |
| Fertilizer Salts, Aqueous          | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Fish Oil                           | 2               | 4                 | 1                         | 1                    | 2                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | X            |
| Fluorine                           | 4               | X                 | 2                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Fluorine, Gas                      | 4               | 1                 | 1                         | X                    | X                           | 4                    | 2                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Fluorine, Liquid                   | X               | 3                 | 2                         | X                    | 4                           | 4                    | 2                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Fluorobenzene                      | 4               | 4                 | 1                         | 2                    | 2                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Fluoroboric Acid                   | X               | 1                 | X                         | X                    | X                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Fluorocarbon Oils                  | 2               | X                 | X                         | X                    | X                           | X                    | 2                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Fluorolube                         | 1               | 1                 | 2                         | 2                    | 1                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | 2            |
| Fluorosilicic Acid                 | 2               | 2                 | 1                         | 4                    | 1                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Formaldehyde                       | 4               | 1                 | 4                         | 4                    | 3                           | 3                    | 2                        | 4                  | 2              | 1              | ◇                             | ◇                           | 4            |
| Formamide                          | 1               | 1                 | 3                         | X                    | 3                           | 3                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Formic Acid 88%                    | 2               | 1                 | 4                         | 3                    | 2                           | 2                    | 2                        | 3                  | 2              | 1              | ◇                             | ◇                           | 3            |
| Freon 11                           | 4               | 4                 | 2                         | 2                    | 2                           | 2                    | 2                        | X                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon 112                          | 2               | 4                 | 2                         | X                    | 2                           | 2                    | 2                        | 2                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon 113                          | 4               | 4                 | 3                         | 4                    | 1                           | 1                    | 2                        | 2                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon 113 & High & Low Aniline Oil | 1               | X                 | X                         | X                    | X                           | 1                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | 4            |
| Freon 114                          | 1               | 4                 | 2                         | 2                    | 1                           | 1                    | 2                        | 1                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon 114B2                        | 1               | 4                 | 2                         | X                    | 2                           | 2                    | X                        | X                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon 115                          | 1               | 1                 | 2                         | X                    | X                           | 1                    | 2                        | X                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon 116                          | 1               | 1                 | X                         | X                    | 1                           | 1                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Freon 12                           | 3               | 3                 | 3                         | 4                    | 1                           | 2                    | 2                        | 1                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon 12 & ASTM Oil No. 2 (50/50)  | 2               | 4                 | 2                         | 2                    | 1                           | 1                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Freon 12 & Sunisco 4G              | 2               | 4                 | X                         | 2                    | 2                           | 1                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |

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|-----------------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Freon 13                          | 1               | 1                 | 1                         | 4                    | 1                           | 1                    | X                        | 3                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon 13B1                        | 1               | 1                 | 1                         | 2                    | 1                           | 1                    | X                        | 1                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon 14                          | 1               | 1                 | 1                         | X                    | 1                           | 1                    | X                        | 1                  | 4              | 1              | ◇                             | ◇                           | X            |
| Freon 142B                        | 1               | 1                 | 4                         | X                    | 2                           | 1                    | 2                        | X                  | X              | 1              | ◇                             | ◇                           | 4            |
| Freon 152A                        | 1               | 1                 | 4                         | X                    | X                           | 1                    | 2                        | X                  | X              | 1              | ◇                             | ◇                           | 4            |
| Freon 21                          | 4               | 4                 | 4                         | X                    | 4                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon 218                         | 1               | 1                 | 2                         | X                    | X                           | 1                    | 2                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Freon 22                          | 1               | 1                 | 4                         | 4                    | 4                           | 4                    | 2                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon 22 & ASTM Oil No. 2 (50/50) | 2               | 4                 | 2                         | 2                    | 4                           | 4                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Freon 31                          | 1               | 1                 | 4                         | X                    | X                           | 4                    | 2                        | X                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon 32                          | 1               | 1                 | 4                         | X                    | 1                           | 1                    | 2                        | X                  | X              | 1              | ◇                             | ◇                           | 4            |
| Freon 502                         | 1               | 1                 | 4                         | X                    | 2                           | 2                    | 2                        | X                  | X              | X              | ◇                             | ◇                           | 4            |
| Freon BF                          | 2               | 4                 | 2                         | X                    | 2                           | 2                    | 2                        | 2                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon C316                        | 1               | 1                 | 2                         | X                    | X                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Freon C318                        | 1               | 1                 | 2                         | X                    | 1                           | 1                    | 2                        | X                  | X              | 1              | ◇                             | ◇                           | 4            |
| Freon MF                          | 4               | 4                 | 3                         | 2                    | 2                           | 2                    | 2                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon T-P35                       | 1               | 1                 | 2                         | X                    | X                           | 1                    | 2                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Freon T-WD602                     | 2               | 2                 | 2                         | X                    | X                           | 2                    | 2                        | 1                  | 4              | 1              | ◇                             | ◇                           | X            |
| Freon TA                          | 1               | 1                 | 4                         | X                    | X                           | 1                    | 2                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Freon TC                          | 1               | 2                 | 2                         | X                    | X                           | 1                    | 2                        | 1                  | 4              | 1              | ◇                             | ◇                           | X            |
| Freon TF                          | 4               | 4                 | 2                         | 4                    | 1                           | 1                    | 2                        | 2                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Freon TMC                         | 2               | 2                 | 2                         | X                    | X                           | 2                    | 2                        | 2                  | 3              | 1              | ◇                             | ◇                           | X            |
| Fuel Oil                          | 4               | 4                 | 1                         | 1                    | 2                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Fumaric Acid                      | 2               | 2                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 2              | X              | ◇                             | ◇                           | 1            |
| Fuming Sulfuric Acid              | 4               | 4                 | X                         | X                    | 2                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Furaldehyde                       | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 4            |
| Furan                             | 4               | 4                 | 4                         | X                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Furfural                          | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Furfuraldehyde                    | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 2                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Furfuryl Alcohol                  | 4               | 2                 | 1                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Furl Carbinol                     | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Fyrquel 90 100 150                | 4               | 1                 | 1                         | 3                    | 4                           | 4                    | 1                        | 4                  | 1              | 2              | ◇                             | ◇                           | 1            |
| Fyrquel A60                       | 4               | 2                 | 1                         | 3                    | 4                           | 4                    | 1                        | 4                  | 3              | X              | ◇                             | ◇                           | 2            |
| Gallic Acid                       | 2               | 2                 | 1                         | 1                    | 2                           | 2                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 1            |
| Gasoline Premium Unleaded         | 3               | 4                 | 1                         | 1                    | 1                           | 2                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 2            |

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| Gear Oil                               | X               | X                 | 1                         | X                    | X                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | 1            |
| Gelatin                                | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | X              | ◇                             | ◇                           | X            |
| Generator Gas                          | 2               | 3                 | 1                         | X                    | X                           | 1                    | X                        | 1                  | 2              | 1              | ◇                             | ◇                           | X            |
| Girling Brake Fluid                    | 2               | 1                 | 3                         | 4                    | 3                           | 3                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Glauber's Salt                         | 2               | 2                 | 1                         | 1                    | 4                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Gluconic Acid                          | X               | X                 | 3                         | X                    | 3                           | 3                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Glucose                                | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Glue                                   | 1               | 1                 | 1                         | 1                    | X                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Glutamic Acid                          | X               | X                 | 3                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Glycerol (Glycerine)                   | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Glycerol Dichlorohydrin                | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Glycerol Monochlorohydrin              | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Glycerol Triacetate                    | 1               | 1                 | X                         | X                    | 3                           | 1                    | X                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Glycerophosphoric Acid                 | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Glyceryl Phosphate                     | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Glycidol                               | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Glycol Ethyl Ether                     | 4               | 2                 | 4                         | 1                    | X                           | 2                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | 1            |
| Glycolic Acid                          | 4               | 1                 | X                         | X                    | 3                           | X                    | X                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Glycols                                | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | 1            |
| Grain Alcohol                          | 1               | 1                 | 2                         | X                    | X                           | 1                    | X                        | 4                  | 1              | 1              | ◇                             | ◇                           | X            |
| Grease (Machine Oil No. 120)           | 3               | 4                 | 1                         | 1                    | X                           | 1                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Grease, Petroleum Base                 | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Green Sulfate Liquor                   | 2               | 1                 | 1                         | 2                    | 2                           | 2                    | 2                        | 1                  | 1              | X              | ◇                             | ◇                           | 1            |
| Gulf Endurance Oils                    | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Gulf FR Fluids                         | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Gulf FR G Fluids                       | 1               | 1                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 1              | X              | ◇                             | ◇                           | X            |
| Gulf FR P Fluids                       | 4               | 2                 | X                         | 2                    | 4                           | 4                    | X                        | 4                  | 1              | X              | ◇                             | ◇                           | X            |
| Gulf Harmony Oils                      | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Gulf High Temperature Grease           | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Gulf Legion Oils                       | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Gulf Paramount Oils                    | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Gulf Security Oils                     | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Gulfcrown Grease                       | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Halite                                 | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | 4                  | 1              | 1              | ◇                             | ◇                           | X            |
| Halothane (Bromochlorotrifluoroethane) | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 2                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |

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| Halowax Oil                     | 4               | 4                 | 1                         | 1                    | 4                           | 4                    | 2                        | X                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Hannifin Lube A                 | 1               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Hanover (MIL-H-83282)           | 2               | 4                 | 1                         | 1                    | X                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Heavy Water                     | 2               | 1                 | 2                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | X              | ◇                             | ◇                           | 1            |
| Hecroflex 600                   | X               | X                 | 1                         | X                    | X                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| HEF-2                           | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| HEF-3                           | 1               | 4                 | 1                         | 2                    | X                           | 2                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Hellum                          | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Heptachlor                      | X               | X                 | 2                         | X                    | 2                           | 3                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 3            |
| Heptachlorobutene               | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Heptaldehyde (Heptanal)         | X               | X                 | 4                         | X                    | 1                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| n-Heptane                       | 4               | 4                 | 1                         | 3                    | 1                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | X            |
| Heptanoic Acid                  | X               | X                 | 1                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Hexachloro Acetone              | 4               | 1                 | 4                         | 4                    | 3                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 4            |
| Hexachlorobutadiene             | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Hexachlorobutene                | X               | X                 | X                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Hexachloroethane                | X               | X                 | 2                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Hexafluoroethane (F-116)        | X               | 1                 | 2                         | 1                    | X                           | X                    | 2                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| n-Hexaldehyde                   | 1               | 1                 | 4                         | 4                    | X                           | 4                    | 1                        | 2                  | 2              | 4              | ◇                             | ◇                           | 4            |
| Hexamethylene (Cyclohexane)     | 4               | 4                 | X                         | X                    | 1                           | 2                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Hexamethylene Diamine           | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 2                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Hexamethylene Tetramine         | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 2                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| n-Hexahe                        | 1               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Hexane                          | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Hexene-1/n-Hexene-1             | 2               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 3            |
| Hexone (Methyl Isobutyl Ketone) | 4               | 2                 | X                         | 4                    | 3                           | 4                    | X                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Hexyl Acetate                   | X               | X                 | 4                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Hexyl Alcohol                   | 2               | 3                 | 1                         | 2                    | 1                           | 2                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Hexyl Hydride                   | 2               | X                 | 1                         | X                    | X                           | 1                    | X                        | 2                  | X              | 1              | ◇                             | ◇                           | X            |
| Hexyl Methyl Ketone             | X               | X                 | 4                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Hexylene Glycol                 | 1               | 3                 | 1                         | X                    | 1                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Hexylresorcinol                 | X               | X                 | 2                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| High Viscosity Lubricant H2     | 2               | 1                 | 1                         | 2                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| High Viscosity Lubricant U4     | 2               | 1                 | 1                         | 2                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Home Heating Oil                | 3               | 4                 | 2                         | X                    | X                           | 1                    | X                        | 2                  | 2              | X              | ◇                             | ◇                           | X            |

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| Honey                                     | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | 3                  | X              | 1              | ◇                             | ◇                           | X            |
| Houghto-Safe 1010                         | 4               | 1                 | 1                         | 2                    | 4                           | 4                    | X                        | 4                  | 3              | X              | ◇                             | ◇                           | X            |
| Houghto-Safe 1055                         | 4               | 1                 | 1                         | 2                    | 4                           | 4                    | X                        | 4                  | 3              | X              | ◇                             | ◇                           | X            |
| Houghto-Safe 1120                         | 4               | 1                 | X                         | 2                    | 4                           | 4                    | X                        | 4                  | 3              | X              | ◇                             | ◇                           | X            |
| Houghto-Safe 271 (Water/Glycol Base)      | 2               | 1                 | X                         | 2                    | 1                           | 1                    | X                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Houghto-Safe 416 & 500 Series             | X               | 1                 | X                         | X                    | 1                           | 1                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Houghto-Safe 5040 (Water/Oil Emulsion)    | 2               | 4                 | X                         | 2                    | 1                           | 1                    | X                        | 4                  | 3              | X              | ◇                             | ◇                           | X            |
| Houghto-Safe 620 (Water/Glycol)           | 2               | 1                 | 1                         | 2                    | 1                           | 1                    | X                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Houghton Vital 29 FM                      | X               | X                 | 1                         | X                    | X                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Hydraulic Oils (Petroleum Base)           | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 3              | 2              | ◇                             | ◇                           | 1            |
| Hydraulic Oils (Synthetic Base)           | X               | X                 | 3                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Hydrazine                                 | 2               | 1                 | 4                         | 4                    | 2                           | 2                    | 2                        | 4                  | 3              | 1              | ◇                             | ◇                           | 2            |
| Hydrazine Dihydrochloride                 | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Hydrazine Hydrate                         | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Hydrazine, Anhydrous                      | 1               | 2                 | 2                         | 4                    | 4                           | 4                    | 1                        | 4                  | X              | X              | ◇                             | ◇                           | 2            |
| Hydriodic Acid                            | 1               | 1                 | 1                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Hydro-Drive MIH-10, Petro Base            | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 2              | X              | ◇                             | ◇                           | X            |
| Hydro-Drive MIH-50, Petro Base            | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 2              | X              | ◇                             | ◇                           | X            |
| Hydrobromic Acid                          | 3               | 1                 | 1                         | 3                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Hydrobromic Acid 40%                      | 2               | 1                 | 1                         | 3                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| Hydrocarbons, Saturated                   | X               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Hydrochloric Acid (cold) 37%              | 2               | 1                 | X                         | 2                    | X                           | 3                    | 1                        | 4                  | 3              | X              | ◇                             | ◇                           | 1            |
| Hydrochloric Acid (hot) 37%               | 4               | 3                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Hydrochloric Acid, 3 Molar to 158°F       | 4               | 1                 | X                         | 3                    | 2                           | X                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Hydrochloric Acid, Conc. Room Temperature | X               | 2                 | 1                         | 3                    | 2                           | 2                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Hydrocyanic Acid                          | 2               | 1                 | 1                         | 2                    | 2                           | 2                    | 1                        | X                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Hydrofluoric Acid (Anhydrous)             | X               | 3                 | 1                         | 4                    | X                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Hydrofluoric Acid 49%                     | 3               | 4                 | 4                         | 4                    | X                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Hydrofluosilicic Acid                     | 2               | 1                 | 1                         | 4                    | 1                           | 2                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Hydrogen                                  | 1               | 1                 | 1                         | 3                    | X                           | 1                    | 1                        | 2                  | 3              | 2              | ◇                             | ◇                           | 1            |
| Hydrogen Bromide (Anhydrous)              | 4               | 1                 | X                         | 4                    | X                           | X                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Hydrogen Chloride, Gas                    | 2               | 1                 | X                         | X                    | X                           | X                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | 1            |
| Hydrogen Cyanide                          | 2               | 1                 | 2                         | 2                    | 2                           | 2                    | X                        | X                  | 3              | X              | ◇                             | ◇                           | X            |
| Hydrogen Fluoride                         | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 2                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Hydrogen Gas, Cold                        | X               | X                 | X                         | X                    | 1                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |





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| Fluid Name                       | Neoprene® (NEO) | EPDM Rubber (EPD) | Fluorocarbon/Viton® (VIT) | Fluorosilicone (FLI) | Hydrogenated Nitrile (HNBR) | Nitrile/Buna-N (NBR) | Perfluoroelastomer (PFR) | Polyurethane (HPU) | Silicone (SIL) | Teflon® (PTFE) | Teflon® Encap. Silicone (EOS) | Teflon® Encap. Viton® (EOV) | Aflas® (AFL) |
|----------------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Hydrogen Gas, Hot                | X               | X                 | X                         | X                    | 1                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Hydrogen Peroxide                | 4               | 3                 | X                         | 2                    | 2                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Hydrogen Peroxide 36%            | 4               | 1                 | 1                         | 2                    | 4                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Hydrogen Sulfide, Dry Cold       | 1               | 1                 | 4                         | 3                    | 1                           | 1                    | 1                        | 1                  | 1              | X              | ◇                             | ◇                           | 1            |
| Hydrogen Sulfide, Dry Hot        | 2               | 2                 | 4                         | 3                    | 4                           | 2                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 1            |
| Hydrogen Sulfide, Wet Cold       | 2               | 1                 | 4                         | 3                    | 4                           | 1                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 1            |
| Hydrogen Sulfide, Wet Hot        | 4               | 2                 | 4                         | 3                    | 4                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 1            |
| Hydrolube                        | 2               | 1                 | 1                         | 2                    | 1                           | 1                    | 1                        | 4                  | 1              | 2              | ◇                             | ◇                           | 1            |
| Hydrolube, Water/Ethylene Glycol | 2               | 1                 | X                         | 2                    | 1                           | 1                    | X                        | 4                  | 1              | X              | ◇                             | ◇                           | X            |
| Hydrooxycitronellel              | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Hydroquinol                      | 4               | X                 | X                         | X                    | 4                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Hydroquinone                     | 4               | 4                 | 2                         | 2                    | 4                           | 3                    | 2                        | X                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Hydroxyacetic Acid               | 2               | 1                 | 3                         | 3                    | 3                           | X                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 2            |
| Hydyne (UHDT)                    | 2               | 1                 | 4                         | 4                    | 2                           | 2                    | 2                        | X                  | 2              | X              | ◇                             | ◇                           | X            |
| Hyjet                            | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Hyjet IV, IVA                    | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 4                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Hyjet S4                         | X               | 1                 | 4                         | X                    | X                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 2            |
| Hyjet W                          | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Hypochlorous Acid                | 4               | 2                 | 1                         | 1                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Indole                           | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Industron FF44, 48, 53, 80       | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 1            |
| Insulin                          | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 1              | X              | ◇                             | ◇                           | X            |
| Iodic Acid                       | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Iodine                           | 4               | 2                 | 1                         | 1                    | 1                           | 2                    | 1                        | 4                  | 2              | 2              | ◇                             | ◇                           | 1            |
| Iodine Pentafluoride             | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Idodform                         | 4               | X                 | 3                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Iron Acetate                     | X               | X                 | 4                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Iron Chloride                    | 2               | 1                 | 1                         | 1                    | X                           | 1                    | X                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Iron Nitrate                     | 1               | 1                 | 1                         | 1                    | X                           | 1                    | X                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Iron Sulfate                     | 1               | 1                 | 1                         | 1                    | X                           | 1                    | X                        | 2                  | 1              | 1              | ◇                             | ◇                           | X            |
| Iron Sulfide                     | X               | X                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Isoamyl Acetate                  | 4               | 2                 | 4                         | X                    | 3                           | 4                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | X            |
| Isoamyl Butyrate                 | X               | X                 | 4                         | X                    | 3                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Isoamyl Chloride                 | 4               | 4                 | 1                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Isoamyl Ether                    | 4               | 4                 | X                         | X                    | X                           | 3                    | X                        | X                  |                | 1              | ◇                             | ◇                           | X            |



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| Isoamyl Valerate       | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Isobutane              | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | X            |
| Isobutyl Acetate       | 4               | 3                 | 4                         | X                    | 3                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Isobutyl Alcohol       | 1               | 1                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Isobutyl Aldehyde      | 3               | 2                 | 4                         | X                    | X                           | 4                    | X                        | 3                  | 3              | 1              | ◇                             | ◇                           | 4            |
| Isobutyl Chloride      | X               | 4                 | 2                         | X                    | 4                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 4            |
| Isobutyl Ether         | X               | 4                 | 4                         | X                    | 2                           | 2                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 4            |
| Isobutyl Methyl Ketone | 4               | 1                 | 4                         | 4                    | 3                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Isobutyraldehyde       | 4               | 1                 | 4                         | 4                    | 2                           | 4                    | 2                        | 4                  | 4              | X              | ◇                             | ◇                           | 4            |
| Isobutyric Acid        | 2               | 2                 | 3                         | X                    | 2                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 3            |
| Isocrotyl Chloride     | 4               | X                 | X                         | 2                    | X                           | X                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Isodecanol             | X               | X                 | 2                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Isododecane            | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 1            |
| Isoeugenol             | X               | X                 | 2                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Isooctane              | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Isopentane             | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | X            |
| Isophorone             | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Isopropanol            | 3               | 1                 | X                         | 2                    | 2                           | 1                    | X                        | 4                  | 1              | X              | ◇                             | ◇                           | X            |
| Isopropyl Acetate      | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Isopropyl Acetone      | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Isopropyl Alcohol      | 3               | 1                 | 1                         | 2                    | 2                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Isopropyl Amine        | X               | X                 | 4                         | X                    | 3                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Isopropyl Chloride     | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Isopropyl Ether        | 4               | 4                 | 4                         | 3                    | 2                           | 2                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Jet Fuel A             | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | X                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| JP-3 (MIL-J-5624)      | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 2            |
| JP-4 (MIL-J-5624)      | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 2            |
| JP-5 (MIL-J-5624)      | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 2            |
| JP-6 (MIL-J-25656)     | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | 2            |
| JP-8 (MIL-T-83133)     | 1               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 2            |
| JP-9 (MIL-F-81912)     | 4               | 4                 | 1                         | 2                    | 3                           | 3                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| KEL-F Liquids          | 3               | 1                 | 3                         | 2                    | 1                           | 1                    | 3                        | X                  | 1              | X              | ◇                             | ◇                           | 3            |
| Kerosene               | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Keystone #87HX Grease  | 4               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Lacquer Solvents       | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |

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| Lacquers                      | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Lactams (Amino Acids)         | 2               | 2                 | 2                         | 4                    | 4                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 3            |
| Lactic Acid, Cold             | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | X              | ◇                             | ◇                           | 1            |
| Lactic Acid, Hot              | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | 1            |
| Lactones (Cyclic Esters)      | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 4                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Lard (Animal Fat)             | 2               | 2                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Lauric Acid                   | 1               | 3                 | 1                         | X                    | 1                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Lavender Oil                  | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Lead Acetate                  | 2               | 1                 | 4                         | 4                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Lead Arsenate                 | 2               | X                 | X                         | X                    | 3                           | 2                    | 1                        | 2                  | X              | X              | ◇                             | ◇                           | X            |
| Lead Bromide                  | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Lead Carbonate                | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Lead Chloride                 | 2               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Lead Chromate                 | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Lead Dioxide                  | X               | X                 | 2                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Lead Linoleate                | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Lead Nitrate                  | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 2              | 1              | ◇                             | ◇                           | 2            |
| Lead Oxide Red                | 1               | 1                 | 2                         | X                    | 3                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Lead Sulfamate                | 2               | 1                 | X                         | 1                    | 2                           | 2                    | 1                        | X                  | 2              | X              | ◇                             | ◇                           | X            |
| Lehigh X1169                  | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Lehigh X1170                  | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Light Grease                  | 4               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Ligroin                       | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Lime Bleach                   | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Lime-Sulfur Solution          | 1               | 1                 | 1                         | 1                    | 1                           | 4                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | 1            |
| Lindol (Hydraulic Fluid)      | 4               | 1                 | 1                         | 3                    | 1                           | 4                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Linoleic Acid                 | 4               | 4                 | 2                         | X                    | 2                           | 2                    | 1                        | 2                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Linseed Oil                   | 1               | 3                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Liquid Oxygen                 | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 2                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Liquified Petroleum Gas (LPG) | 3               | 4                 | 1                         | 3                    | 1                           | 1                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Liquimoly                     | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Liquor                        | X               | 1                 | 1                         | X                    | X                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Lithium Bromide, Brine        | 4               | 1                 | 2                         | 1                    | 3                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Lithium Carbonate             | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Lithium Chloride              | 1               | 1                 | 1                         | 1                    | 3                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | X            |



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|------------------------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Lithium Citrate                          | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Lithium Hydroxide                        | 4               | 1                 | 3                         | 4                    | 3                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Lithium Hypochlorite                     | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Lithium Nitrite                          | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Lithopone                                | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Lubricating Oils, Diester                | 3               | 4                 | 2                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Lubricating Oils, Petroleum              | 2               | 4                 | 1                         | 1                    | 4                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Lubricating Oils, SAE 10, 20, 30, 40, 50 | 4               | 4                 | X                         | 1                    | 4                           | 1                    | X                        | 1                  | X              | X              | ◇                             | ◇                           | X            |
| Lye                                      | 1               | 1                 | 2                         | 2                    | 2                           | 2                    | 1                        | 2                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Machine Oil                              | 4               | 4                 | 1                         | X                    | X                           | 1                    | X                        | 1                  | X              | 1              | ◇                             | ◇                           | X            |
| Magnesium Acetate                        | 4               | 1                 | 4                         | 4                    | X                           | 4                    | X                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Magnesium Bisulfite                      | 2               | X                 | X                         | X                    | X                           | 2                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Magnesium Chloride                       | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Magnesium Hydroxide                      | 2               | 1                 | 1                         | X                    | 2                           | 2                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Magnesium Salts                          | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Magnesium Sulfate (Epsom Salts)          | 2               | 1                 | 1                         | 1                    | X                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Magnesium Sulfite                        | 1               | 1                 | 2                         | 1                    | 1                           | 1                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | 1            |
| Malthion                                 | X               | 4                 | 2                         | 2                    | X                           | 2                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Maleic Acid                              | 4               | 4                 | 1                         | 1                    | 4                           | 3                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Maleic Anhydride                         | 4               | 4                 | 4                         | X                    | 4                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Maleic Hydrazide                         | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Malic Acid                               | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 2              | X              | ◇                             | ◇                           | 1            |
| Mandelic Acid                            | X               | X                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Manganese Acetate                        | X               | X                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Manganese Carbonate                      | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Manganese Chloride                       | 2               | 3                 | 2                         | 1                    | 3                           | 1                    | X                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| Manganese Dioxide                        | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Manganese Gluconate                      | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Manganese Hypophosphite                  | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Manganese Linoleate                      | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Manganese Phosphate                      | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Manganese Sulfate                        | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Manganous Chloride                       | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Manganous Phosphate                      | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Manganous Sulfate                        | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |



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| Mannitol                    | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| MCS 312                     | 4               | 4                 | X                         | 1                    | 4                           | 4                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| MCS 352                     | 4               | 1                 | X                         | 3                    | 4                           | 4                    | X                        | 4                  | 3              | X              | ◇                             | ◇                           | X            |
| MCS 463                     | 4               | 1                 | X                         | 3                    | 4                           | 4                    | X                        | 4                  | 3              | X              | ◇                             | ◇                           | X            |
| Mercaptan                   | 4               | 1                 | 3                         | X                    | 1                           | 4                    | X                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Mercaptobenzothiazole (MBT) | X               | 1                 | 1                         | X                    | X                           | 3                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Mercuric Acetate            | X               | X                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Mercuric Chloride           | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Mercuric Cyanide            | 2               | 1                 | 2                         | X                    | 3                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Mercuric Iodide             | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Mercuric Nitrate            | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Mercuric Sulfate            | 2               | 1                 | 2                         | X                    | 3                           | 1                    | 1                        | X                  | 2              | 1              | ◇                             | ◇                           | X            |
| Mercuric Sulfite            | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Mercurous Nitrate           | 1               | 1                 | 2                         | 1                    | 3                           | 2                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | X            |
| Mercury                     | 1               | 1                 | 1                         | 3                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Mercury Chloride            | 1               | 1                 | X                         | X                    | 1                           | 1                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Mercury Fulminate           | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Mercury Salts               | 2               | 2                 | X                         | X                    | 3                           | 1                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Mercury Vapor               | 4               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 1            |
| Mesityl Oxide               | 4               | 2                 | 4                         | 4                    | 4                           | X                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Meta-Nitroaniline           | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Metalddehyde                | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Meth Acrylic Acid           | X               | 2                 | 3                         | 4                    | 3                           | 3                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 2            |
| Methane                     | 2               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Methanol (Methyl Alcohol)   | 4               | 1                 | 4                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Methoxychlor                | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Methyl Abietate             | X               | X                 | 2                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Methyl Acetate              | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Methyl Acetoacetate         | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 4            |
| Methyl Acetophenone         | X               | X                 | 4                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Methyl Acrylate             | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Methyl Alcohol (Methanol)   | 4               | 1                 | 4                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Methyl Amine                | 4               | 1                 | 4                         | X                    | 3                           | 2                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Methyl Amyl Alcohol         | 1               | 1                 | 4                         | X                    | X                           | 2                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Methyl Amyl Ketone          | X               | X                 | X                         | X                    | 4                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |

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| Methyl Aniline                | 1               | 1                 | 2                         | X                    | X                           | 1                    | X                        | 4                  | X              | 1              | ◇                             | ◇                           | X            |
| Methyl Anthranilate           | 4               | X                 | 1                         | 2                    | X                           | X                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Methyl Benzene                | 4               | 4                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Methyl Benzoate               | 4               | 4                 | 1                         | 1                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Methyl Bichloride             | X               | 3                 | 2                         | X                    | X                           | 4                    | X                        | 4                  | X              | 1              | ◇                             | ◇                           | X            |
| Methyl Bromide                | 4               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 2            |
| Methyl Butyl Ketone           | 4               | 1                 | 4                         | 4                    | X                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Methyl Butyrate Cellosolve    | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Methyl Butyrate Chloride      | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Methyl Carbitol               | X               | 3                 | X                         | X                    | X                           | X                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Methyl Carbonate              | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Methyl Cellosolve             | 4               | 2                 | 4                         | 4                    | 3                           | 3                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Methyl Cellulose              | 2               | 2                 | 4                         | 4                    | 2                           | 2                    | 1                        | 2                  | 2              | X              | ◇                             | ◇                           | 1            |
| Methyl Chloracetate           | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Methyl Chloride               | 4               | 4                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Methyl Chloroform             | 4               | 4                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Methyl Chloroformate          | 4               | 4                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| Methyl Cyanide                | 1               | 1                 | X                         | X                    | 3                           | 3                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Methyl Cyclohexanone          | X               | X                 | 4                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Methyl Cyclopentane           | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Methyl Dichloride             | 4               | 4                 | X                         | X                    | X                           | 4                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Methyl Ether                  | 3               | 2                 | 4                         | 1                    | 1                           | 1                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | 4            |
| Methyl Ethyl Ketone (MEK)     | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Methyl Ethyl Ketone Peroxide  | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Methyl Formate                | 2               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 4            |
| Methyl Hexyl Ketone           | X               | X                 | 4                         | X                    | 3                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Methyl Iodide                 | 4               | 1                 | X                         | X                    | 1                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Methyl Isobutyl Ketone (MIBK) | 4               | 3                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Methyl Isocyanate             | X               | X                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Methyl Isopropyl Ketone       | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Methyl Lactate                | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Methyl Mercaptan              | X               | 1                 | 3                         | X                    | X                           | X                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Methyl Methacrylate           | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Methyl Oleate                 | 4               | 2                 | 2                         | 2                    | 4                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Methyl Phenylacetate          | X               | X                 | 4                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |



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| Methyl Salicylate              | 4               | 2                 | 2                         | X                    | X                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 3            |
| Methyl tert-Butyl Ether (MTBE) | 3               | 3                 | 4                         | X                    | 3                           | 3                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| n-Methyl-2 Pyrrolidone         | X               | 2                 | 2                         | 2                    | X                           | X                    | 1                        | X                  | 2              | X              | ◇                             | ◇                           | X            |
| Methyl-2-Pyrrolidone           | X               | 2                 | 2                         | 2                    | X                           | X                    | 1                        | X                  | 2              | X              | ◇                             | ◇                           | X            |
| Methylallyl Chloride           | X               | X                 | 3                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Methylcyclopentane             | X               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 2            |
| Methylene Bromide              | 4               | 4                 | 1                         | 1                    | X                           | 2                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Methylene Chloride             | 4               | 3                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Methylene Chlorobromide        | 4               | X                 | 4                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Methylene Dichloride           | 4               | 4                 | 2                         | 2                    | X                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | X            |
| <b>Military Specifications</b> |                 |                   |                           |                      |                             |                      |                          |                    |                |                |                               |                             |              |
| MIL-L-644B                     | 3               | 3                 | X                         | 1                    | X                           | 1                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-2104                     | 1               | 4                 | X                         | X                    | 4                           | 1                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| MIL-L-2104B                    | 2               | 4                 | 1                         | 1                    | X                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-2105B                    | 1               | 4                 | 1                         | 1                    | X                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-G-2108                     | 1               | 4                 | 1                         | 1                    | X                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-S-3136B TYPE I             | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-S-3136B TYPE II            | 4               | 4                 | 1                         | 1                    | 1                           | 2                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-S-3136B TYPE III           | 4               | 4                 | 1                         | 1                    | 1                           | 2                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-S-3136B TYPE IV            | 1               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-S-3136B TYPE V             | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-S-3136B TYPE VI            | 4               | 4                 | 1                         | 1                    | X                           | 1                    | X                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-S-3136B TYPE VII           | 3               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-3150A                    | 2               | 4                 | 1                         | 1                    | X                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-G-3278                     | 4               | 4                 | 1                         | X                    | X                           | 2                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-3503                     | 2               | 4                 | 1                         | 1                    | X                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-3545B                    | 2               | 4                 | 1                         | 1                    | X                           | 2                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-4339C                    | 4               | 4                 | 1                         | 1                    | X                           | 1                    | 1                        | 4                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-G-4343B                    | 2               | 2                 | 1                         | 2                    | 2                           | 2                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-5020A                    | 2               | 4                 | 1                         | 1                    | X                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-J-5161F                    | 4               | 4                 | 1                         | 1                    | X                           | 2                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-C-5545A                    | 2               | 4                 | 1                         | 1                    | X                           | 2                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-M-5559A                    | 2               | 1                 | 2                         | 2                    | X                           | 1                    | 1                        | 3                  | 2              | X              | ◇                             | ◇                           | X            |
| MIL-F-5566                     | 2               | 1                 | 1                         | 1                    | X                           | 2                    | 1                        | 4                  | 1              | X              | ◇                             | ◇                           | X            |
| MIL-G-5572                     | 4               | 4                 | 1                         | X                    | X                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |

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|-----------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| MIL-F-5602            | 2               | 4                 | 1                         | 1                    | X                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-O-5606            | X               | X                 | 1                         | X                    | X                           | 1                    | X                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-H-5606B (Red Oil) | 2               | 2                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-J-5624G (JP3)     | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 2            |
| MIL-J-5624G (JP4)     | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | 2            |
| MIL-J-5624G (JP5)     | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 2            |
| MIL-O-6081C           | 2               | X                 | X                         | 1                    | X                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-6082C           | 2               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-H-6083C           | 1               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-6085A           | 4               | 4                 | X                         | 1                    | 2                           | 2                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | 2            |
| MIL-L-6086B           | 1               | 4                 | X                         | 1                    | X                           | 1                    | X                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-6087A           | X               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-A-6091            | 1               | 1                 | 1                         | 1                    | X                           | 2                    | 1                        | 4                  | 1              | X              | ◇                             | ◇                           | X            |
| MIL-L-6387A           | 4               | 4                 | X                         | 1                    | 2                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-C-6529C           | 2               | 4                 | X                         | 1                    | X                           | 2                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-F-7024A           | 4               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-H-7083A           | 2               | X                 | X                         | 2                    | X                           | 1                    | 1                        | 3                  | 2              | X              | ◇                             | ◇                           | X            |
| MIL-G-7118A           | 3               | 4                 | X                         | 1                    | 2                           | 1                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-G-7187            | 4               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 1                  | X              | X              | ◇                             | ◇                           | X            |
| MIL-G-7421A           | 3               | 4                 | X                         | 1                    | 2                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-H-7644            | 2               | 2                 | X                         | X                    | X                           | X                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| MIL-L-7645            | 2               | 4                 | X                         | 1                    | X                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| MIL-G-7711A           | 4               | 4                 | X                         | X                    | 1                           | 1                    | 1                        | 1                  | X              | X              | ◇                             | ◇                           | X            |
| MIL-O-7808            | 4               | 4                 | 1                         | 1                    | 2                           | 1                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| MIL-L-7808A           | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| MIL-L-7870A           | 2               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 4                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-C-8188C           | 4               | 4                 | X                         | 1                    | 2                           | 1                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-A-8243B           | 2               | 1                 | X                         | 2                    | X                           | X                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-8383B           | 1               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-H-8446B           | 1               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 1            |
| MIL-I-8660B           | 1               | 1                 | 1                         | 1                    | X                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-9000F           | 2               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-T-9188B           | 4               | 1                 | X                         | 3                    | X                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-9236B           | 4               | 3                 | X                         | 1                    | X                           | 1                    |                          | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-E-9500            | 1               | 1                 | 1                         | 1                    | 1                           | 1                    |                          | 4                  | 1              | X              | ◇                             | ◇                           | X            |



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|---------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| MIL-L-102995A | 2               | X                 | X                         | 1                    | 4                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-10324A  | 2               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-G-10924B  | 4               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-11734B  | 3               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-O-11773   | 3               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-P-12098   | 2               | 1                 | X                         | X                    | X                           | 2                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-H-13862   | 2               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-H-13866A  | 2               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-H-13910B  | 1               | 1                 | X                         | 2                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-H-13919A  | 2               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-14107B  | 1               | 4                 | X                         | 1                    | X                           | 3                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-15016   | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-15017   | 2               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-15018B  | 1               | 4                 | X                         | X                    | X                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-15019A  | 1               | 4                 | 1                         | 1                    | X                           | 1                    | X                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-15719A  | 2               | 2                 | X                         | X                    | X                           | 2                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| MIL-G-15793   | 2               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-F-16884   | 3               | 4                 | 1                         | 1                    | 1                           | 1                    | X                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-F-16929   | 3               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-16958A  | 2               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-F-17111   | 2               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-17331D  | 2               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-17353A  | 3               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-17672B  | 1               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-18486A  | 1               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-G-18709A  | 1               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-H-19457B  | 4               | 1                 | X                         | 3                    | 1                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-F-19605   | 3               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-19701   | 3               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-21260   | 2               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-S-21568A  | 1               | 1                 | X                         | 2                    | 1                           | 1                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-H-22072   | 2               | 1                 | X                         | 2                    | X                           | 1                    | 1                        | 3                  | 2              | X              | ◇                             | ◇                           | X            |
| MIL-H-22251   | 2               | 1                 | 1                         | 1                    | 2                           | 2                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-22396A  | 1               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-G-23827A  | 3               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |

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|----------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| MIL-G-25013D         | 2               | 1                 | X                         | 2                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-F-25172          | 3               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-25336B         | 3               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-F-25524A         | 3               | 4                 | 1                         | 1                    | X                           | 1                    | X                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-G-25537A         | 2               | 4                 | X                         | 1                    | 2                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-F-25558B (RJ-1)  | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | 1            |
| MIL-F-25576C (RP-1)  | 2               | X                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-H-25598          | 2               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-F-25656B (JP-6)  | 4               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-25681C         | 2               | 1                 | X                         | 2                    | 2                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-G-25760A         | 2               | 4                 | X                         | 1                    | 2                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-25968          | 3               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-L-26087A         | 1               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-G-27343          | 1               | 1                 | X                         | 1                    | X                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| MIL-P-27402          | 2               | 1                 | X                         | X                    | 2                           | 2                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-H-27601A         | 2               | 4                 | X                         | 1                    | 1                           | 2                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-G-27617          | X               | 1                 | X                         | 1                    | X                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| NIL-I-27686D         | 2               | 1                 | X                         | 2                    | X                           | 1                    | 1                        | 3                  | 2              | X              | ◇                             | ◇                           | X            |
| MIL-L-27694A         | 1               | 1                 | X                         | 1                    | X                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-46000A         | 3               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-H-46001A         | 1               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-46002            | 1               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-H-46004          | 2               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-P-46046A         | 2               | 1                 | X                         | 2                    | X                           | 2                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-H-81019B         | 2               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| MIL-S-81087          | 1               | 1                 | X                         | 2                    | X                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-F-81912 (JP-9)   | 4               | 4                 | 1                         | 2                    | 3                           | 3                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-F-82522 (RJ-4)   | 4               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-F-82522 (JP-8)   | 3               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 2            |
| MIL-H-83282          | 2               | 4                 | 1                         | 1                    | X                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| MIL-L-23699          | 3               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |
| MLO-7277             | 4               | 4                 | 1                         | 3                    | 3                           | 3                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 1            |
| MLO-7557             | 4               | 4                 | 1                         | 3                    | 3                           | 3                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | 1            |
| MLO-8200             | 1               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| MLO-8515 (ML-H-8446) | 2               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |



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|-----------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Milk                        | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Mineral Oil                 | 1               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Mixed Acids                 | X               | 4                 | 3                         | 4                    | 3                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 3            |
| Mobil 24DTE                 | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | 1            |
| Mobil 600 Series            | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Mobil Delvac 1100 1110 1120 | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | X              | ◇                             | ◇                           | 1            |
| Mobil JF                    | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 2            |
| Mobil Nivac 20, 30          | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | 1            |
| Mobil SHC 500 Series        | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Mobil Therm 600             | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 1            |
| Mobil Velocite C            | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | 1            |
| Mobilgas WA200 ATF          | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Mobilgear 600 Series        | 4               | 3                 | 1                         | 1                    | 3                           | 3                    | 1                        | 2                  | 1              | X              | ◇                             | ◇                           | X            |
| Mobilegear SHC ISO Series   | 4               | 3                 | 1                         | 1                    | 3                           | 3                    | 1                        | 2                  | 1              | X              | ◇                             | ◇                           | X            |
| Mobilgrease HTS             | 4               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Mobilgrease HP              | 4               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Mobilgrease SM              | 4               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Mobilith AW Series          | 4               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Mobilith SHC Series         | 4               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| MobilJet II Lubricant       | X               | X                 | 1                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Mobilmistlube Series        | 4               | 3                 | 1                         | 1                    | 3                           | 3                    | 1                        | 2                  | 1              | X              | ◇                             | ◇                           | X            |
| Mobiloil SAE 20             | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Mobilux                     | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | 1            |
| Molybdenum Disulfide Grease | X               | 4                 | 2                         | 4                    | X                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Molybdenum Oxide            | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |



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| Molybdcic Acid           | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Monobromobenzene         | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Monobutyl Ether          | 3               | 3                 | 4                         | 3                    | X                           | 2                    | X                        | 2                  | 4              | 1              | ◇                             | ◇                           | X            |
| Monochlorobutene         | 4               | X                 | 1                         | 2                    | X                           | X                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Monochloroacetic Acid    | 3               | 3                 | X                         | 4                    | 3                           | 4                    | X                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Monochloroacetone        | 3               | 1                 | 2                         | 4                    | X                           | 4                    | X                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Monochlorobenzene        | 4               | 4                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Monochlorophenol         | 4               | 4                 | 1                         | 2                    | X                           | 4                    | X                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Monoethanol Amine        | 2               | 2                 | 2                         | 4                    | 4                           | 4                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Monoisoproyl Amine       | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Monomethyl Aniline       | 4               | 4                 | 3                         | X                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Monomethyl Hydrazine     | 2               | 1                 | 4                         | X                    | 2                           | 2                    | 2                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Monovinyl Acetate        | 4               | 2                 | 1                         | X                    | X                           | 4                    | X                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Monovinyl Acetylene      | X               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | X                  | 2              | X              | ◇                             | ◇                           | 3            |
| Mopar Brake Fluid        | 2               | 1                 | 4                         | 4                    | 3                           | 3                    | 1                        | X                  | 3              | X              | ◇                             | ◇                           | 1            |
| Morpholine               | 4               | 4                 | X                         | X                    | X                           | 4                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Motor Oils               | 2               | 4                 | X                         | X                    | 1                           | 1                    | X                        | 2                  | X              | X              | ◇                             | ◇                           | X            |
| Myristic Acid            | X               | X                 | 1                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Naphtha                  | 4               | 4                 | 1                         | 2                    | 2                           | 1                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Napthalene               | 4               | 4                 | 1                         | 1                    | 4                           | 4                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Napthalene Sulfonic Acid | 4               | X                 | X                         | 2                    | X                           | X                    | 1                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Napthalenic Acid         | 4               | X                 | 1                         | 2                    | X                           | X                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Napthalonic Acid         | 4               | X                 | 1                         | 2                    | X                           | X                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Napthenic Acid           | 4               | 4                 | X                         | 1                    | 2                           | 2                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Natural Gas              | 1               | 4                 | 1                         | 3                    | 1                           | 1                    | 1                        | 3                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Neats Foot Oil           | 4               | 2                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Neon                     | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Neville Acid             | 4               | 2                 | 1                         | 2                    | 4                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Nickel Acetate           | 2               | 1                 | 4                         | 4                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Nickel Ammonium Sulfate  | 1               | 1                 | 2                         | X                    | 3                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 1            |
| Nickel Chloride          | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Nickel Cyanide           | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Nickel Nitrate           | 2               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Nickel Salts             | 2               | 1                 | X                         | 1                    | 1                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Nickel Sulfate           | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 1              | 1              | ◇                             | ◇                           | 1            |

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| Nicotinamide (Niacinamide) | 4               | X                 | 1                         | 2                    | X                           | X                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Nicotinamide Hydrochloride | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Nicotine                   | 3               | X                 | 2                         | X                    | X                           | X                    | 1                        | 2                  | X              | 1              | ◇                             | ◇                           | X            |
| Nicotine Sulfate           | 2               | X                 | X                         | X                    | 3                           | 1                    | X                        | 1                  | X              | X              | ◇                             | ◇                           | X            |
| Niter Cake                 | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Nitric Acid 10%            | 4               | 3                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | 2            |
| Nitric Acid 70%            | 4               | 4                 | 2                         | 4                    | X                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 3            |
| Nitric Acid, Concentrated  | 4               | 4                 | X                         | 3                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Nitric Acid, Red Fuming    | 4               | 4                 | 3                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Nitric Acid, White Fuming  | 4               | 4                 | X                         | 4                    | 4                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Nitroaniline               | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Nitrobenzene               | 4               | 4                 | 3                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| nitrobenzoic Acid          | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Nitrocellulose             | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Nitrochlorobenzene         | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Nitrochloroform            | 1               | 1                 | 1                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Nitrodiethyl Aniline       | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Nitroethane                | 3               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Nitrofluorobenzene         | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 1              | X              | ◇                             | ◇                           | X            |
| Nitrogen                   | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Nitrogen Oxide(s)          | 4               | 3                 | 4                         | 4                    | 3                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | X            |
| Nitrogen Tetroxide (N2O4)  | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 2                        | 4                  | 4              | X              | ◇                             | ◇                           | 3            |
| Nitroglycerine             | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Nitroglycerol              | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | 1            |
| Nitromethane               | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Nitrophenol                | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Nitropropane               | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Nitrothiophene             | X               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Nitrotoluene               | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Nitrous Acid               | X               | 2                 | X                         | X                    | 3                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Nitrous Oxide              | X               | 1                 | 3                         | X                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | X            |
| Nonane                     | X               | X                 | 1                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Nyvac FR200 Mobil          | 4               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Octachlorotoluene          | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Octadecane                 | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |



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| n-Octane                     | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Octane                       | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Octanol (n-Octanoldehyde)    | 2               | 1                 | 4                         | 2                    | 2                           | 2                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| n-Octyl Acetate              | X               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Octyl Acetate                | X               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Octyl Alcohol                | 2               | 2                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | 1            |
| Octyl Chloride               | X               | X                 | X                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Octyl Phthalate              | X               | X                 | 3                         | X                    | X                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Olefins                      | X               | X                 | 1                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Oleic Acid                   | 4               | 4                 | 2                         | 1                    | 3                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Oleum (Fuming Sulfuric Acid) | 4               | 4                 | 2                         | 4                    | 2                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Oleum Spirits                | 4               | 4                 | X                         | 2                    | 2                           | 2                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| Oleyl Alcohol                | X               | X                 | 1                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Olive Oil                    | 4               | 2                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Oronite 8200                 | 4               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Oronite 8515                 | 4               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Oronite M2V                  | X               | X                 | 4                         | X                    | X                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Orthochloro Aniline          | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Orthochloro Ethyl Benzene    | 4               | 4                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Orthochloro Phenol           | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Orthocresol                  | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Orthodichloro Benzene        | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Orthonitro Toluene           | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| OS-45 Type III (OS45)        | 1               | 4                 | 1                         | 2                    | 2                           | 2                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| OS-45 Type IV (OS45-1)       | 1               | 4                 | 1                         | 2                    | 2                           | 2                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| OS-70                        | 1               | 4                 | X                         | 2                    | 2                           | 2                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Oxalic Acid                  | 2               | 1                 | 1                         | 1                    | 2                           | 2                    | 1                        | X                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Oxygen, 200°F to 300°F       | X               | 4                 | 2                         | X                    | 4                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Oxygen, 300°F to 400°F       | X               | 4                 | X                         | X                    | 4                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Oxygen, Liquid               | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 2                        | 4                  | 4              | X              | ◇                             | ◇                           | 4            |
| Oxygen, Gas                  | 4               | 4                 | 2                         | 1                    | 4                           | 4                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 4            |
| Ozonated Deionized Water     | X               | 2                 | 3                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ozone                        | 4               | 1                 | 1                         | 1                    | 4                           | 4                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| p-Cymene                     | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 3            |
| p-Dichlorobenzene            | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |

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| p-tert-Butylcaltechol             | X               | 2                 | X                         | 1                    | X                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 1            |
| Paint Thinner-Duco                | 4               | 4                 | 3                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Palmitic Acid (Hexadecanoic Acid) | 2               | 2                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Par-al-Ketone                     | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 2                        | 4                  | 4              | X              | ◇                             | ◇                           | 4            |
| Para-Aminobenzoic Acid            | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Para-Aminosalicylic Acid          | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Para-Chlorophenol                 | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Para-Cymene                       | 4               | X                 | 1                         | 2                    | X                           | X                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Para-Dichlorobenzene              | 4               | 4                 | X                         | 2                    | 4                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Para-Formaldehyde                 | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Para-Nitroaniline                 | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Para-Nitrobenzoic Acid            | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Para-Nitrophenol                  | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Para-Toluene Sulfonic Acid        | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Parafins                          | 2               | 4                 | 1                         | X                    | 1                           | 1                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | X            |
| Paraldehyde                       | 4               | 1                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Parker O-Lube                     | 1               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Parker Super O-Lube               | 1               | 1                 | 1                         | 1                    | X                           | 1                    | X                        | 1                  | 2              | 1              | ◇                             | ◇                           | X            |
| Peanut Oil                        | 4               | 3                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Pectin (Liquor)                   | 3               | 4                 | X                         | 1                    | X                           | 1                    | X                        | 1                  | 1              | X              | ◇                             | ◇                           | X            |
| Pelargonic Acid                   | X               | X                 | 2                         | X                    | X                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Penicillin (Liquid)               | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Pentachloroethane                 | 4               | 4                 | 2                         | X                    | X                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Pentachlorophenol                 | 4               | 3                 | 2                         | 2                    | 3                           | 4                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | X            |
| Pentaerythritol                   | X               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Pentaerythritol Tetranitrate      | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| n-Pentane                         | 1               | 4                 | 1                         | 3                    | X                           | 1                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Pentane, 2 Methyl                 | 2               | 4                 | X                         | 3                    | 1                           | 1                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Pentane, 2-4 Dimethyl             | 4               | 4                 | 1                         | 3                    | 1                           | 1                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Pentane, 3 Methyl                 | 2               | 4                 | X                         | 3                    | 1                           | 1                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Peracetic Acid                    | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Perchloric Acid                   | 2               | 2                 | 1                         | 1                    | 4                           | 4                    | 1                        | 4                  | 4              | 3              | ◇                             | ◇                           | 1            |
| Perchloroethylene                 | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 4            |
| Petrolatum                        | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | X            |
| Petrolatum Ether                  | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |



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| Petroleum, Below 250°F           | 4               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | 1            |
| Petroleum, Above 250°F           | 4               | 4                 | 2                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Petroleum Crude                  | 2               | 4                 | 2                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Phenol (Carbolic Acid)           | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Phenol, 70%/30%/H <sub>2</sub> O | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Phenol, 85%/15%/H <sub>2</sub> O | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Phenolic Sulfonate               | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Phenosulfonic Acid               | X               | X                 | 1                         | X                    | 3                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Phenyl Acetamide                 | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Phenyl Acetate                   | 4               | 2                 | 4                         | 2                    | 3                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Phenyl Benzene                   | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 3            |
| Phenyl Ethyl Ether               | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Phenyl Hydrazine                 | 4               | 4                 | 3                         | X                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Phenyl Mercuric Acetate          | X               | X                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Phenylethyl Alcohol              | 4               | X                 | 1                         | 2                    | X                           | X                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Phenylhydrazine Hydrachloride    | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Phorone                          | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Phosgene                         | 3               | 1                 | 4                         | X                    | X                           | 4                    | 1                        | X                  | X              | 2              | ◇                             | ◇                           | X            |
| Phosphoric Acid 20%              | 3               | 1                 | 1                         | 2                    | 4                           | 4                    | 1                        | 3                  | 3              | X              | ◇                             | ◇                           | 1            |
| Phosphoric Acid 60%              | 2               | 1                 | 1                         | 3                    | X                           | 4                    | X                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Phosphoric Acid 80%              | 3               | 1                 | 1                         | 3                    | X                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 1            |
| Phosphorous Trichloride          | 4               | 1                 | 1                         | 1                    | 4                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 1            |
| Phosphorous Trichloride Acid     | X               | 1                 | X                         | 1                    | 4                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Phthalic Acid                    | 3               | 1                 | 2                         | X                    | 3                           | 3                    | 1                        | X                  | 2              | 1              | ◇                             | ◇                           | X            |
| Phthalic Anhydride               | 1               | 2                 | 4                         | X                    | 3                           | 3                    | 1                        | 1                  | X              | 1              | ◇                             | ◇                           | 3            |
| Pickling Solution                | 4               | 3                 | 1                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Picric Acid                      | 3               | 3                 | 1                         | 2                    | 1                           | 4                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Pine Oil                         | 4               | 4                 | 1                         | 1                    | 1                           | 2                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Pine Tar                         | X               | X                 | 1                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Pinene                           | 3               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Piperidine                       | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Plating Solution, Chrome         | 4               | 2                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Plating Solution, Others         | 1               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Potassium Cupro Cyanide          | 1               | 1                 | X                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | X              | ◇                             | ◇                           | X            |
| Polyethylene Glycol              | 2               | 1                 | 1                         | X                    | 2                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 1            |



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| Polyglycerol               | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Polyglycol                 | 1               | 1                 | X                         | 1                    | 3                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Polyvinyl Acetate Emulsion | 2               | 1                 | 3                         | X                    | X                           | 1                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 1            |
| Potassium Acetate          | 2               | 1                 | 4                         | 4                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Potassium Acid Sulfate     | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Potassium Alum             | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Potassium Aluminum Sulfate | 2               | 1                 | X                         | X                    | 1                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Potassium Antimonate       | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Potassium Bicarbonate      | 1               | 1                 | 1                         | 1                    | 3                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | X            |
| Potassium Bichromate       | 4               | 1                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 1              | X              | ◇                             | ◇                           | X            |
| Potassium Bifluoride       | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Potassium Bisulfate        | 1               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Potassium Bisulfite        | 1               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | 1                  | X              | 1              | ◇                             | ◇                           | X            |
| Potassium Bitartrate       | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Potassium Bromide          | 2               | 1                 | 2                         | 1                    | 3                           | 1                    | 1                        | X                  | 1              | 1              | ◇                             | ◇                           | X            |
| Potassium Carbonate        | 2               | 1                 | 2                         | 1                    | X                           | 1                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | X            |
| Potassium Chlorate         | 2               | 1                 | 2                         | 1                    | X                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | X            |
| Potassium Chloride         | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Potassium Chromate         | 1               | 1                 | 2                         | X                    | 3                           | 1                    | 1                        | 2                  | X              | 1              | ◇                             | ◇                           | X            |
| Potassium Citrate          | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Potassium Cupro Cyanide    | 1               | 1                 | 1                         | 1                    | X                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Potassium Cyanate          | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Potassium Cyanide          | 4               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Potassium Dichromate       | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | X              | ◇                             | ◇                           | 1            |
| Potassium Diphosphate      | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Potassium Ferricyanide     | 1               | 1                 | 2                         | X                    | 3                           | 2                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Potassium Fluoride         | 1               | 1                 | 1                         | X                    | 3                           | 2                    | 1                        | 2                  | X              | 1              | ◇                             | ◇                           | X            |
| Potassium Glucocyanate     | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Potassium Hydroxide        | 4               | 1                 | 4                         | 3                    | 2                           | 2                    | 1                        | 4                  | 3              | X              | ◇                             | ◇                           | 1            |
| Potassium Hypochlorite     | 3               | 1                 | 4                         | X                    | 3                           | 2                    | X                        | 2                  | X              | X              | ◇                             | ◇                           | X            |
| Potassium Iodate           | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Potassium Iodide           | 1               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Potassium Metabisulfate    | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Potassium Metachromate     | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Potassium Nitrate          | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | X              | ◇                             | ◇                           | 1            |



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| Potassium Perchlorate              | 3               | X                 | 1                         | X                    | 3                           | 2                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Potassium Permanganate             | 1               | 1                 | 2                         | X                    | 3                           | 3                    | 1                        | 2                  | X              | 1              | ◇                             | ◇                           | X            |
| Potassium Persulfate               | 3               | 1                 | X                         | X                    | 3                           | 1                    | 1                        | 2                  | X              | X              | ◇                             | ◇                           | X            |
| Potassium Phosphate (Di/Tri Base)  | 1               | 1                 | X                         | 1                    | 3                           | 1                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Potassium Phosphate, Acid          | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Potassium Phosphate, Alkaline      | 1               | 1                 | 1                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Potassium Pyrosulfate              | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Potassium Salts                    | 1               | 1                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 1              | X              | ◇                             | ◇                           | X            |
| Potassium Silicate                 | 1               | 1                 | 1                         | 1                    | X                           | 1                    | 1                        | 1                  | 1              | X              | ◇                             | ◇                           | X            |
| Potassium Sodium Tartrate          | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Potassium Stannate                 | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Potassium Stearate                 | X               | X                 | 2                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Potassium Sulfate                  | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 4              | ◇                             | ◇                           | 1            |
| Potassium Sulfide                  | 1               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Potassium Sulfite                  | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Potassium Tartrate                 | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Potassium Thiocyanate              | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Potassium Triphosphate             | 1               | 1                 | X                         | 1                    | 3                           | 1                    | X                        | 4                  | 1              | X              | ◇                             | ◇                           | X            |
| Perstone Antifreeze                | 3               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 2            |
| PRL-High Temperature Hydraulic Oil | 2               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 2                  | 2              | X              | ◇                             | ◇                           | 1            |
| Producer Gas                       | 2               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 1                  | 2              | 2              | ◇                             | ◇                           | 1            |
| Propane                            | 3               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Propionaldehyde                    | 4               | 1                 | 4                         | 4                    | 3                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Propionic Acid                     | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Propionitrile                      | 2               | 1                 | 4                         | X                    | 1                           | 4                    | X                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| n-Propyl Acetate                   | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Propyl Acetate                     | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Propyl Acetone                     | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| n-Propyl Acetone                   | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Propyl Alcohol (Propanol)          | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 4              | ◇                             | ◇                           | 1            |
| Propyl Amine                       | 4               | 1                 | X                         | 4                    | 3                           | 4                    | 2                        | 4                  | 3              | X              | ◇                             | ◇                           | X            |
| Propyl Benzene                     | 4               | X                 | 1                         | 2                    | X                           | X                    | 1                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Propyl Cyanide                     | 4               | 1                 | X                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Propyl Nitrate                     | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Propyl Propionate                  | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |

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|------------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Propylene                    | 4               | 4                 | 1                         | 2                    | 3                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Propylene Chloride           | 4               | 4                 | X                         | X                    | X                           | 4                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Propylene Chlorohydrin       | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Propylene Dichloride         | 4               | 4                 | 2                         | 2                    | X                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Propylene Glycol             | 3               | 1                 | 1                         | 1                    | 3                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Propylene Imine              | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Propylene Oxide              | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Pydraul 115E                 | 4               | 1                 | 1                         | 3                    | 4                           | 4                    | 1                        | 4                  | 4              | 2              | ◇                             | ◇                           | 1            |
| Pydraul 230C, 312C, 540C     | 4               | 4                 | 1                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 2              | ◇                             | ◇                           | 1            |
| Pydraul 29ELT, 30E, 50E, 65E | 4               | 2                 | X                         | 1                    | 4                           | 4                    | X                        | 4                  | 1              | X              | ◇                             | ◇                           | X            |
| Pydraul 90E                  | 4               | 2                 | X                         | 1                    | 4                           | 4                    | X                        | 4                  | 1              | X              | ◇                             | ◇                           | X            |
| Pyranol (Transformer Oil)    | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 1            |
| Pyridine                     | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Pyridine Oil                 | 4               | 2                 | X                         | 4                    | 4                           | 4                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Pyrogallol (Pyrogallic Acid) | X               | 2                 | X                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Pyrogard 42, 43, 53, 55      | 4               | 1                 | 2                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 2              | ◇                             | ◇                           | 2            |
| Pyrogard C & D               | 2               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 4                  | 3              | 2              | ◇                             | ◇                           | 1            |
| Pyroligneous Acid            | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 4            |
| Pyrolube                     | 4               | 2                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | 1            |
| Pyrosulfuric Acid            | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Pyrosulfuryl Chloride        | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Pyrrole                      | 4               | 4                 | 4                         | 4                    | 4                           | 4                    | 1                        | X                  | 2              | 1              | ◇                             | ◇                           | X            |
| Pyruvic                      | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Quinidine                    | X               | X                 | X                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Quinine                      | X               | X                 | 1                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Quinine Bisulfate            | 1               | 1                 | X                         | X                    | 3                           | 1                    | X                        | 1                  | X              | X              | ◇                             | ◇                           | X            |
| Quinine Hydrochloride        | 1               | 1                 | 1                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Quinine Sulfate              | 1               | 1                 | X                         | X                    | 3                           | 1                    | X                        | 1                  | X              | X              | ◇                             | ◇                           | X            |
| Quinine Tartrate             | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Quinizarin                   | X               | X                 | 1                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Quinoline                    | X               | X                 | 1                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Quinone                      | X               | X                 | 2                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Radiation                    | 3               | 3                 | 3                         | 4                    | 3                           | 3                    | 1                        | 3                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Raffinate                    | X               | X                 | 1                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Rapeseed Oil                 | 2               | 1                 | 1                         | 1                    | 2                           | 2                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 1            |

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|----------------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Red Line 100 Oil                 | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Red Oil (MIL-H-5606)             | 2               | 3                 | 1                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | 2            |
| Resins                           | 4               | 4                 | 1                         | X                    | X                           | 2                    | 1                        | 1                  | X              | X              | ◇                             | ◇                           | X            |
| Resorcinol                       | 4               | 4                 | 1                         | X                    | 3                           | 4                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 1            |
| Riboflavin                       | X               | X                 | 1                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Ricinoleic Acid                  | X               | X                 | 1                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| RJ-1 (MIL-F-25558)               | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 1            |
| RJ-4 (MIL-F-82522)               | X               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 1            |
| Rosin                            | 1               | 3                 | 1                         | 1                    | 2                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | X            |
| RP-1 (MIL-R-25576)               | 3               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | 1            |
| Rust Inhibitors                  | 3               | X                 | 1                         | X                    | X                           | 1                    | X                        | 1                  | X              | X              | ◇                             | ◇                           | X            |
| Saccharin Solution               | X               | 1                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sal Ammoniac                     | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Salicylic Acid                   | 1               | 1                 | 1                         | 1                    | 2                           | 2                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 1            |
| Salt Water                       | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Sanitizers                       | X               | X                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Santosafe 300                    | 4               | 3                 | 1                         | 1                    | 4                           | 4                    | 1                        | 4                  | 1              | 2              | ◇                             | ◇                           | 1            |
| Sebacic Acid                     | X               | X                 | 2                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| sec-Butyl Alcohol (SBA)          | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | X                        | 4                  | 2              | 1              | ◇                             | ◇                           | X            |
| Sewage                           | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| SF 1147                          | X               | 3                 | X                         | X                    | 2                           | 2                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| SF 1153                          | 1               | 1                 | X                         | 1                    | 2                           | 2                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| SF 1154                          | 1               | 1                 | X                         | 1                    | 2                           | 2                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| SF96 (GE Silicone Fluid)         | 1               | 1                 | X                         | 1                    | 2                           | 2                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Shell 3XF Mine Fluid             | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Shell Alvania Grease #2          | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Shell Carnea 19 & 29             | 4               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | X              | X              | ◇                             | ◇                           | X            |
| Shell Diala                      | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Shell Iris 905                   | 1               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Shell Lo Hydra 5, 27, 29         | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Shell Macome 72                  | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Shell Tellus 27 (Petroleum Base) | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Shell Tellus 32 (Petroleum Base) | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 4            |
| Shell Tellus 33                  | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Shell Tellus 68                  | X               | X                 | X                         | X                    | 1                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |

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| Shell UMF, 5% Aromatic        | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Shellac                       | 4               | 1                 | 2                         | X                    | 3                           | 1                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | X            |
| Silicate Esters               | 1               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Silicone Greases              | 1               | 1                 | 1                         | 1                    | 2                           | 1                    | 1                        | 1                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Silicone Oils                 | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Silver Acetate                | 1               | X                 | 1                         | X                    | 1                           | X                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Silver Bromide                | X               | X                 | X                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Silver Chloride               | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Silver Cyanide                | 1               | 1                 | 2                         | 1                    | 3                           | 1                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Silver Nitrate                | 2               | 1                 | 1                         | 1                    | 3                           | 2                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Silver Sulfate                | 1               | 1                 | 2                         | X                    | 2                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Sinclair Opaline CX-EP Lube   | 2               | 4                 | 1                         | 2                    | 3                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Skelly Solvent B, C, E        | 4               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Skydrol 500 B4 LO-4           | 4               | 1                 | 4                         | 3                    | 1                           | 4                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Skydrol 7000                  | 4               | 1                 | 3                         | 3                    | 4                           | 4                    | 1                        | 4                  | 3              | X              | ◇                             | ◇                           | 1            |
| Skydrol LD-4                  | 4               | 1                 | 4                         | 3                    | 4                           | 4                    | 4                        | 4                  | 3              | X              | ◇                             | ◇                           | X            |
| Soap Solutions                | 2               | 1                 | 1                         | 1                    | 4                           | 1                    | 1                        | 3                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Socony Mobile Type A          | 2               | 4                 | X                         | 2                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Socony PD959B Vacuum          | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Socony Vacuum AMV AC781       | 2               | 4                 | X                         | 2                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Soda                          | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Soda Alum                     | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Soda Ash                      | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Sodium Acetate                | 2               | 1                 | 1                         | 4                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Sodium Acid Bisulfate         | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Sodium Acid Fluoride          | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Sodium Acid Sulfate           | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Sodium Aluminate              | 1               | 1                 | 2                         | X                    | 3                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Aluminate Sulfate      | 2               | 1                 | X                         | X                    | 3                           | 1                    | X                        | 1                  | 1              | X              | ◇                             | ◇                           | X            |
| Sodium Antraquinone Disulfate | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Antimonate             | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Arsenate               | 4               | X                 | 2                         | X                    | 3                           | 2                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Sodium Arsenite               | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Benzoate               | 1               | 1                 | 2                         | X                    | 3                           | 2                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Sodium Bicarbonate            | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |

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|-----------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Sodium Bichromate     | 2               | 1                 | X                         | X                    | 3                           | 1                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Bisulfate      | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Sodium Bisulfite      | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Sodium Borate         | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Sodium Bromate        | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Bromide        | 1               | 1                 | 2                         | X                    | 3                           | X                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Sodium Carbonate      | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | X                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Sodium Chlorate       | 2               | 1                 | 2                         | X                    | 3                           | 1                    | 1                        | 2                  | X              | 1              | ◇                             | ◇                           | 3            |
| Sodium Chloride       | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Sodium Chlorite       | 4               | 4                 | X                         | X                    | 3                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Chloroacetate  | X               | X                 | 3                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Chromate       | 1               | X                 | 2                         | X                    | 3                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Sodium Citrate        | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Cyanide        | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | X              | ◇                             | ◇                           | 1            |
| Sodium Diacetate      | X               | X                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Diphosphate    | 2               | X                 | X                         | X                    | 3                           | 1                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Ethylate       | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Ferricyanide   | 1               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Sodium Ferrocyanide   | 1               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | 2                  | X              | 1              | ◇                             | ◇                           | X            |
| Sodium Fluoride       | 1               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | 2                  | X              | 1              | ◇                             | ◇                           | X            |
| Sodium Fluorosilicate | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Glutamate      | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Hydrosulfide   | X               | X                 | 2                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Hydroxide      | 4               | 1                 | 3                         | 2                    | 2                           | 4                    | 1                        | 2                  | 2              | X              | ◇                             | ◇                           | 1            |
| Sodium Hypochlorite   | 1               | 2                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Sodium Hypophosphate  | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Hypophosphite  | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Hypsulfite     | 2               | 1                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Sodium Iodide         | X               | X                 | 2                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Lactate        | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Metaphosphate  | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Sodium Metasilicate   | 1               | 1                 | 2                         | X                    | 3                           | 1                    | 1                        | 2                  | X              | 1              | ◇                             | ◇                           | X            |
| Sodium Methylate      | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Nitrate        | 2               | 1                 | 1                         | X                    | 2                           | 2                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Sodium Oleate         | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |

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|-----------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Sodium Orthosilicate        | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Oxalate              | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Perborate            | 2               | 1                 | 1                         | 1                    | 2                           | 2                    | 1                        | 2                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Sodium Percarbonate         | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Perchlorate          | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Peroxide             | 4               | 1                 | 2                         | 1                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Sodium Persulfate           | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Phosphate, Dibasic   | 4               | 1                 | 1                         | X                    | 1                           | 1                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Sodium Phosphate, Monobasic | 4               | 1                 | 1                         | X                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Sodium Phosphate, Tribasic  | 4               | 1                 | 1                         | 2                    | 1                           | 1                    | X                        | 1                  | 1              | X              | ◇                             | ◇                           | X            |
| Sodium Plumbite             | X               | X                 | X                         | X                    | 3                           | 2                    | 1                        | 2                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Pyrophosphate        | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Salicylate           | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Salts                | 2               | 2                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Sodium Sesquisilicate       | X               | X                 | 2                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Silicate             | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Sodium Stannate             | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Sulfate              | 2               | 1                 | 1                         | 1                    | 4                           | 1                    | 1                        | 1                  | X              | X              | ◇                             | ◇                           | 1            |
| Sodium Sulfide              | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Sodium Tartrate             | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Tetraborate          | 2               | 1                 | X                         | 1                    | 3                           | 1                    | X                        | 2                  | 1              | X              | ◇                             | ◇                           | X            |
| Sodium Tetrasulfide         | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Thioarsenate         | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Thiocyanate          | X               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 2            |
| Sodium Thiosulfate          | 1               | 1                 | 1                         | 1                    | 2                           | 2                    | 1                        | 1                  | 1              | X              | ◇                             | ◇                           | X            |
| Sodium Trichloroacetate     | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sodium Triphosphate         | 2               | 2                 | X                         | X                    | 3                           | 1                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Solvasol 1, 2, 3            | 2               | 4                 | 2                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Solvasol 73, 74             | 2               | 4                 | X                         | 1                    | 2                           | 2                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Solvents                    | 3               | 4                 | 1                         | X                    | X                           | 1                    | X                        | 2                  | X              | 1              | ◇                             | ◇                           | X            |
| Sorbitol                    | X               | X                 | 2                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sour Crude Oil              | X               | 4                 | 4                         | 4                    | 3                           | 3                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Sour Natural Gas            | X               | 4                 | 4                         | 4                    | 3                           | 3                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Soybean Oil                 | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Spry                        | 2               | 2                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 1              | X              | ◇                             | ◇                           | X            |

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| SR10 Fuel                           | 4               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| SR6 Fuel                            | 4               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 1            |
| Standard Oil Mobillube G490-EP Lube | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Stannic Ammonium Chloride           | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Stannic Chloride                    | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Stannic Sulfide                     | X               | X                 | X                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Stannic Tetrachloride               | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Stannous Bisulfate                  | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Stannous Bromide                    | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Stannous Chloride                   | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 3                  | 2              | X              | ◇                             | ◇                           | 1            |
| Stannous Fluoride                   | X               | X                 | 1                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Stannous Sulfate                    | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Stannous Sulfide                    | X               | X                 | X                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Stauffer 7700                       | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 3            |
| Steam, Below 300°F                  | 3               | 1                 | 2                         | 4                    | 4                           | 4                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Steam, Above 300°F                  | 4               | 3                 | X                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Stearic Acid                        | 2               | 2                 | 1                         | 3                    | 2                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Stoddards Solvent (ASTM D-484-52)   | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Strontium Acetate                   | X               | X                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Strontium Carbonate                 | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Strontium Chloride                  | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Strontium Hydroxide                 | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Strontium Nitrate                   | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Styrene, Monomer                    | 4               | 4                 | 2                         | 3                    | 4                           | 4                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Succinic Acid                       | X               | 1                 | 2                         | X                    | 3                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Sucrose Solution                    | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Sulfamic Acid                       | 2               | 4                 | 2                         | X                    | 3                           | X                    | 1                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Sulfanilic Acid                     | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sulfanilic Chloride                 | X               | X                 | X                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sulfanilimide                       | X               | X                 | X                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sulfite Liquors                     | 2               | 2                 | 2                         | 2                    | 3                           | 2                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Sulfolane                           | X               | 1                 | 2                         | X                    | 2                           | 2                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Sulfonic Acid                       | X               | X                 | X                         | X                    | 3                           | 4                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sulfonyl Chloride                   | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 2                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Sulphite Liquors                    | 1               | 1                 | 1                         | 2                    | X                           | 1                    | X                        | 3                  | 4              | 1              | ◇                             | ◇                           | X            |



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| Sulfur                      | 1               | 1                 | X                         | 1                    | 4                           | 4                    | 1                        | X                  | 3              | X              | ◇                             | ◇                           | X            |
| Sulfur Chloride             | 4               | 4                 | 1                         | 1                    | 4                           | 4                    | 1                        | 3                  | 3              | 2              | ◇                             | ◇                           | 1            |
| Sulfur Dioxide, Dry         | 4               | 1                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 2              | 1              | ◇                             | ◇                           | 2            |
| Sulfur Dioxide, Liquified   | 1               | 1                 | 2                         | 2                    | 4                           | 4                    | 1                        | 2                  | 2              | 1              | ◇                             | ◇                           | X            |
| Sulfur Dioxide, Wet         | 4               | 1                 | 2                         | 2                    | 4                           | 4                    | X                        | 3                  | 2              | X              | ◇                             | ◇                           | X            |
| Sulfur Hexafluoride         | 1               | 1                 | 2                         | 2                    | 2                           | 2                    | 1                        | 2                  | 2              | 1              | ◇                             | ◇                           | 3            |
| Sulfur Liquors              | 2               | 2                 | X                         | 2                    | 2                           | 2                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Sulfur Monochloride         | 4               | 4                 | X                         | 1                    | 1                           | X                    | X                        | 3                  | 3              | X              | ◇                             | ◇                           | X            |
| Sulfur Tetrafluoride        | X               | X                 | 3                         | X                    | X                           | X                    | 2                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Sulfur Trioxide             | 4               | 2                 | 1                         | 2                    | 4                           | 4                    | 1                        | 2                  | 2              | 1              | ◇                             | ◇                           | 2            |
| Sulfuric Acid, 20%          | 3               | 1                 | 1                         | 1                    | 3                           | 3                    | X                        | 3                  | X              | X              | ◇                             | ◇                           | 2            |
| Sulfuric Acid, 20% Oleum    | 4               | 1                 | 1                         | 1                    | 2                           | 4                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Sulfuric Acid, 40%          | 3               | 1                 | 1                         | 1                    | X                           | 3                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | 2            |
| Sulfuric Acid, 60%          | 3               | 1                 | 2                         | 3                    | X                           | 3                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | 2            |
| Sulfuric Acid, Concentrated | 4               | 3                 | 1                         | 4                    | X                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Sulfuric Acid, Fuming       | 4               | 4                 | 2                         | 4                    | 4                           | 4                    | X                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Sulfurous Acid              | 4               | 2                 | 3                         | X                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Sulfurous Oxychloride       | 1               | X                 | X                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Sunlight                    | 2               | 1                 | X                         | X                    | X                           | X                    | X                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Sunoco 3661                 | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Sunoco All Purpose Grease   | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Sunoco SAE 10               | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Sunoco XS-820               | X               | 4                 | 1                         | X                    | X                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| SunSAFE                     | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| SuperShell Gasoline         | 2               | 4                 | 2                         | 2                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 3            |
| Swanfinch EP Lubricant      | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 2            |
| Swanfinch Hypoid 90         | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Sweet Birch Oil             | 4               | 3                 | 2                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Sweet Oil                   | 2               | 1                 | 1                         | X                    | X                           | 1                    | X                        | 2                  | 4              | 1              | ◇                             | ◇                           | X            |
| Syrup                       | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Table Salt                  | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | X                        | 1                  | 3              | 1              | ◇                             | ◇                           | X            |
| Tallow                      | 3               | 4                 | 1                         | 1                    | 1                           | 4                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | X            |
| Tannic Acid                 | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Tar                         | 3               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | X                  | 2              | X              | ◇                             | ◇                           | 1            |
| Tar, Bituminous             | 4               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | X                  | 2              | X              | ◇                             | ◇                           | X            |

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|---------------------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Tar, Camphor                          | 4               | 4                 | 1                         | 1                    | 4                           | 4                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | X            |
| Tartaric Acid                         | 4               | 3                 | 2                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Terephthalic Acid                     | X               | X                 | 1                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Terpene                               | 4               | 4                 | 1                         | X                    | X                           | 3                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Terpineol                             | 4               | 3                 | 1                         | 1                    | 2                           | 2                    | 1                        | 2                  | X              | X              | ◇                             | ◇                           | 1            |
| Terpinyl Acetate                      | X               | X                 | 4                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Tertrabromoethane                     | 4               | 4                 | X                         | 2                    | 4                           | 4                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Tetrabromomethane                     | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Tetrachloroethane                     | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 4            |
| Tetrachloroethylene                   | 4               | 4                 | 1                         | 2                    | 4                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Tetraethyl Lead                       | 3               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 2                  | X              | X              | ◇                             | ◇                           | 3            |
| Tetrahydrofuran (THF)                 | 4               | 3                 | 4                         | 4                    | 4                           | 4                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Tetralin (Tetrahydronaphthalene)      | 4               | 4                 | 2                         | 1                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Tetramethyl Ammonium Hydroxide (TMAH) | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Tetramethyl Dihydropyridine           | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Tetraphospho Glucosate                | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Tetrol                                | 4               | 4                 | 3                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Texaco 34X0 Gear Oil                  | 4               | 4                 | 1                         | 1                    | 4                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Texaco Capella A & AA                 | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Texaco Meropa 220 (No Lead)           | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Texaco Regal B                        | 4               | 4                 | X                         | 4                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Texaco Uni-Temperature Grease         | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | 1            |
| Texamatic 1581 Fluid                  | 2               | 4                 | 1                         | 2                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Texamatic 3401 Fluid                  | 2               | 4                 | X                         | 2                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Texamatic 3528 Fluid                  | 2               | 4                 | X                         | 2                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Texamatic 3X2X Fluid                  | 2               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | 1            |
| Texamatic A Transmission Oil          | 2               | 4                 | X                         | 2                    | 1                           | 1                    | X                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Texas 1500 Oil                        | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Therminol 44,45                       | 4               | 4                 | 1                         | X                    | 4                           | 4                    | X                        | X                  | 4              | X              | ◇                             | ◇                           | X            |
| Therminol 55                          | X               | X                 | 1                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Therminol 66                          | 4               | 4                 | X                         | X                    | X                           | 4                    | X                        | X                  | 2              | X              | ◇                             | ◇                           | X            |
| Thioamyl Alcohol                      | 4               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | X            |
| Thiodiacetic Acid                     | 1               | 1                 | 1                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Thioethanol                           | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Thioethyl Alcohol                     | 4               | 4                 | 2                         | X                    | X                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |

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| Thioglycolic Acid               | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Thiokol TP-90B                  | 2               | 1                 | 2                         | 2                    | 4                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Thiokol TP-95                   | 2               | 1                 | 2                         | 2                    | 4                           | 4                    | 1                        | X                  | 2              | X              | ◇                             | ◇                           | 1            |
| Thionyl Chloride                | 4               | 3                 | 2                         | X                    | 2                           | 4                    | 1                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Thiophene                       | 4               | 4                 | 4                         | X                    | 2                           | 4                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Thiophosphoryl Chloride         | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Thiourea                        | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Thorium Nitrate                 | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Tidewater Multigear 140 EP Lube | 2               | 4                 | X                         | 1                    | 1                           | 1                    | X                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Tidewater Oil (Beedol)          | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | X              | ◇                             | ◇                           | 1            |
| Tin Chloride                    | 4               | 1                 | X                         | 1                    | 1                           | 1                    | X                        | 2                  | 2              | X              | ◇                             | ◇                           | X            |
| Tin Tetrachloride               | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 2              | 1              | ◇                             | ◇                           | X            |
| Titanic Acid                    | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Titanium Dioxide                | X               | X                 | 2                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Titanium Salts                  | X               | 4                 | 1                         | X                    | X                           | 2                    | X                        | 2                  | X              | 1              | ◇                             | ◇                           | X            |
| Titanium Sulfate                | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Titanium Tetrachloride          | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Toluene                         | 4               | 4                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Toluene Disocyanate (TDI)       | 4               | 2                 | 4                         | 4                    | 4                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Toluene Sulfonyl Chloride       | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 3                  | X              | X              | ◇                             | ◇                           | X            |
| Toluene Sulfonic Acid           | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Toluidine                       | X               | X                 | X                         | X                    | 2                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Toluol                          | 4               | 4                 | X                         | 2                    | 3                           | 4                    | X                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Toluquinone                     | X               | X                 | X                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Tolyaldehyde                    | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 1            |
| Transformer Oil                 | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Transmission Fluid Type A       | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Tricresyl Phosphate             | 2               | 1                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 3              | X              | ◇                             | ◇                           | X            |
| Triacetin                       | 2               | 1                 | 4                         | 4                    | 2                           | 2                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 4            |
| Triaryl Phosphate               | 4               | 1                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 3              | X              | ◇                             | ◇                           | 1            |
| Tribromomethyl Benzene          | X               | X                 | X                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Tributoxyethyl Phosphate        | 4               | 1                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | 1            |
| Tributyl Amine                  | X               | X                 | 4                         | X                    | X                           | 2                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Tributyl Citrate                | X               | X                 | 4                         | X                    | 3                           | X                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Tributyl Mercaptan              | 4               | 4                 | 2                         | 3                    | 4                           | 4                    | 1                        | X                  | 4              | 1              | ◇                             | ◇                           | X            |

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| Tributyl Phosphate                   | 4               | 1                 | 4                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Trichloroacetic Acid (TCA)           | 4               | 2                 | 3                         | 4                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Trichloroacetyl Chloride             | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Trichlorobenzene 1, 2, 3             | 4               | X                 | 2                         | 4                    | 2                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Trichloroethane 1                    | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Trichloroethylene (TCE)              | 4               | 4                 | 1                         | 3                    | 3                           | 4                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | 4            |
| Trichlorofluoromethane (Freon 11)    | 4               | 4                 | 2                         | 2                    | 2                           | 2                    | 2                        | X                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Trichloromethane                     | 4               | 4                 | 1                         | 2                    | 4                           | 4                    | X                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Trichloropropane                     | 1               | X                 | X                         | X                    | 4                           | 1                    | 1                        | 1                  | X              | X              | ◇                             | ◇                           | X            |
| Trichlorosilane                      | X               | X                 | X                         | X                    | 4                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Trichlorotrifluoroethane (Freon 113) | 1               | 4                 | 2                         | 4                    | 1                           | 2                    | 2                        | 2                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Tricresyl Phosphate                  | 4               | 1                 | 1                         | 2                    | 4                           | 4                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Tridecanol                           | X               | X                 | 2                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Triethanolamine (TEA)                | 4               | 2                 | 4                         | 4                    | 3                           | 3                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Triethyl Aluminum                    | 4               | 3                 | 2                         | X                    | X                           | 4                    | 1                        | 4                  | X              | X              | ◇                             | ◇                           | X            |
| Triethyl Amine                       | 2               | 1                 | X                         | X                    | 3                           | 1                    | 1                        | 4                  | 4              | X              | ◇                             | ◇                           | X            |
| Triethyl Borane                      | 4               | 3                 | 1                         | X                    | 2                           | 4                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | X            |
| Triethyl Phosphate                   | X               | 1                 | 1                         | 2                    | 2                           | 4                    | 1                        | X                  | 3              | X              | ◇                             | ◇                           | X            |
| Triethylene Glycol (TEG)             | X               | X                 | 2                         | X                    | 3                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Trimethyl Amine (TMA)                | X               | X                 | 4                         | X                    | 3                           | X                    | 2                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Trimethyl Borate (TMB)               | X               | X                 | X                         | X                    | 2                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Trimethyl Methane                    | X               | X                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Trimethylpentane                     | 4               | 4                 | X                         | X                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| Trinitrotoluene (TNT)                | 1               | 4                 | 2                         | 2                    | 4                           | 4                    | 1                        | X                  | 3              | 1              | ◇                             | ◇                           | 2            |
| Trioctyl Phosphate                   | 4               | 2                 | 2                         | 2                    | 4                           | 4                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Triphenyl Phosphite                  | X               | X                 | 3                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | 1            |
| Tripoly Phosphate                    | 4               | 1                 | 2                         | 1                    | 4                           | 4                    | 1                        | 4                  | 3              | X              | ◇                             | ◇                           | X            |
| Tripotassium Phosphate               | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Trisodium Phosphate                  | 2               | 1                 | X                         | 4                    | 3                           | 1                    | X                        | 2                  | 1              | X              | ◇                             | ◇                           | X            |
| TT-N-95B                             | X               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| TT-N-97B                             | X               | 4                 | X                         | X                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| TT-I-735B                            | X               | 1                 | X                         | X                    | 1                           | 1                    | 1                        | 2                  | X              | X              | ◇                             | ◇                           | X            |
| TT-I-735 TYPE I                      | X               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 2                  | 4              | X              | ◇                             | ◇                           | X            |
| TT-S-735 TYPE II                     | X               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| TT-S-735 TYPE III                    | X               | 4                 | X                         | 1                    | X                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |

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|------------------|--------------------------|
| 1 = Satisfactory | 4 = Not Recommended      |
| 2 = Fair         | X = Data Not Available   |
| 3 = Poor         | ◇ = Contact EPM For Info |

### Fluid Name

| Fluid Name                              | Neoprene® (NEO) | EPDM Rubber (EPD) | Fluorocarbon/Viton® (VIT) | Fluorosilicone (FLI) | Hydrogenated Nitrile (HNBR) | Nitrile/Buna-N (NBR) | Perfluoroelastomer (PFR) | Polyurethane (HPU) | Silicone (SIL) | Teflon® (PTFE) | Teflon® Encap. Silicone (EOS) | Teflon® Encap. Viton® (EOV) | Aflas® (AFL) |
|-----------------------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| TT-S-735 TYPE IV                        | X               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 1                  | 3              | X              | ◇                             | ◇                           | X            |
| TT-S-735 TYPE V                         | X               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | 4            |
| TT-S-735 TYPE VI                        | X               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 2                  | 3              | X              | ◇                             | ◇                           | X            |
| TT-S-7335 TYPE VII                      | X               | 4                 | X                         | 1                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| Tung Oil                                | 2               | 4                 | 1                         | 2                    | 1                           | 1                    | 1                        | 3                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Turbine Oil                             | 4               | 4                 | 1                         | 2                    | 1                           | 2                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Turbine Oil No. 15 (MIL-L-7808A)        | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Turbo No. 10 Oil                        | 4               | X                 | 1                         | X                    | 2                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Turbo Oil No. 35                        | X               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | X            |
| Turpentine                              | 4               | 4                 | 2                         | 2                    | 1                           | 1                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 1            |
| Ucon Hydrolube J-4                      | 2               | 1                 | 3                         | 2                    | 2                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Ucon Lubricant 50-HB-100                | 1               | 1                 | 1                         | 1                    | 2                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Ucon Lubricant 50-HB-260                | 1               | 1                 | 1                         | 1                    | 2                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Ucon Lubricant 50-HB-5100               | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Ucon Lubricant 50-HB-55                 | 1               | 1                 | 1                         | 1                    | 2                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Ucon Lubricant 50-HB-660                | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Ucon Lubricant LB-1145                  | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Ucon Lubricant LB-135                   | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Ucon Lubricant LB-285                   | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Ucon Lubricant LB-3005                  | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Ucon Lubricant LB-625                   | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Ucon Lubricant LB-65                    | 1               | 1                 | 1                         | 1                    | 2                           | 1                    | X                        | 4                  | 1              | X              | ◇                             | ◇                           | X            |
| Ucon Oil 50 HB-2805                     | 1               | 1                 | X                         | 1                    | 2                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | 1            |
| Ucon Oil Heat Transfer Fluid            | 1               | 1                 | X                         | 1                    | 1                           | 1                    | X                        | X                  | 1              | X              | ◇                             | ◇                           | X            |
| Ucon Oil LB-385                         | 1               | 1                 | 4                         | 1                    | 2                           | 2                    | 1                        | 2                  | 1              | X              | ◇                             | ◇                           | 1            |
| Ucon Oil LB-400                         | 1               | 1                 | 4                         | 1                    | 2                           | 1                    | 1                        | 2                  | 1              | X              | ◇                             | ◇                           | 1            |
| UDMH (Unsymmetrical Dimethyl Hydrazine) | 2               | 1                 | 4                         | 4                    | 2                           | 2                    | 2                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Univis 40 Hydraulic Fluid               | 2               | 4                 | 4                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Univolt No. 35 (Mineral Oil)            | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| UPDI (Ultra Pure Deionized Water)       | X               | 2                 | 2                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 2            |
| Uric Acid                               | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Urine                                   | 4               | 1                 | 1                         | X                    | X                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Valeraldehyde                           | X               | X                 | X                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Vaerlic Acid                            | 4               | 1                 | 1                         | X                    | 3                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Vanadium Oxide                          | X               | X                 | X                         | X                    | 1                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |

## Fluid Compatibility Guide

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|                  |                          |
|------------------|--------------------------|
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### Fluid Name

| Fluid Name                      | Neoprene® (NEO) | EPDM Rubber (EPD) | Fluorocarbon/Viton® (VIT) | Fluorosilicone (FLI) | Hydrogenated Nitrile (HNBR) | Nitrile/Buna-N (NBR) | Perfluoroelastomer (PFR) | Polyurethane (HPU) | Silicone (SIL) | Teflon® (PTFE) | Teflon® Encap. Silicone (EOS) | Teflon® Encap. Viton® (EOV) | Aflas® (AFL) |
|---------------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Vanadium Pentoxide              | X               | X                 | X                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Varnish                         | 4               | 4                 | 1                         | 2                    | 2                           | 2                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Vegetable Oils                  | 1               | 3                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 4              | ◇                             | ◇                           | 1            |
| Versilube F44, F50, F55         | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 3              | 2              | ◇                             | ◇                           | 1            |
| Vinegar                         | 2               | 1                 | 1                         | 3                    | 2                           | 2                    | 1                        | 4                  | 3              | 2              | ◇                             | ◇                           | 1            |
| Vinyl Acetate                   | 4               | 2                 | 4                         | X                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Vinyl Benzene                   | 4               | 4                 | X                         | 3                    | 4                           | 4                    | X                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| Vinyl Bromide                   | 1               | X                 | X                         | X                    | X                           | X                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Vinyl Chloride                  | 4               | 4                 | 2                         | X                    | 2                           | 4                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | 3            |
| Vinyl Cyanide                   | 2               | 4                 | 3                         | 4                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | X            |
| Vinyl Ether                     | X               | X                 | 4                         | X                    | X                           | 2                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Vinyl Fluoride                  | 2               | X                 | 2                         | X                    | 2                           | X                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Vinyl Oxide                     | X               | X                 | 4                         | X                    | X                           | 2                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Vinyl Toluene                   | X               | X                 | 1                         | X                    | X                           | 4                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Vinylidene Chloride             | 4               | 3                 | 1                         | 4                    | 2                           | 4                    | 1                        | 4                  | X              | 1              | ◇                             | ◇                           | X            |
| Vitriol (White)                 | X               | X                 | X                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| VV-H-910                        | 2               | 1                 | 1                         | 2                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | 1            |
| Wagner 21B Brake Fluid          | 2               | 1                 | 4                         | 4                    | 3                           | 3                    | 1                        | 4                  | 3              | 1              | ◇                             | ◇                           | 1            |
| Water                           | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 2              | 1              | ◇                             | ◇                           | 1            |
| Wax                             | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | 1                  | 1              | 1              | ◇                             | ◇                           | X            |
| Wemco C                         | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | X              | ◇                             | ◇                           | 1            |
| Whiskey & Whines                | 3               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 4                  | 1              | 1              | ◇                             | ◇                           | 1            |
| White Liquor                    | 1               | 1                 | 1                         | X                    | 1                           | 1                    | X                        | X                  | X              | 1              | ◇                             | ◇                           | 1            |
| White Oil                       | 2               | 4                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 4              | 1              | ◇                             | ◇                           | 1            |
| White Pine Oil                  | 4               | 4                 | 1                         | 1                    | 2                           | 2                    | 1                        | X                  | 4              | X              | ◇                             | ◇                           | 1            |
| Wolmar Salts                    | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Wood Alcohol                    | 4               | 1                 | 4                         | 1                    | 1                           | 1                    | X                        | 4                  | 1              | X              | ◇                             | ◇                           | X            |
| Wood Oil                        | 1               | 4                 | X                         | 2                    | 1                           | 1                    | 1                        | 3                  | 4              | X              | ◇                             | ◇                           | X            |
| Xenon                           | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Xylene                          | 4               | 4                 | 2                         | 1                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Xylidenes Mixed Aromatic Amines | X               | X                 | 4                         | X                    | 3                           | X                    | X                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Xylidine                        | 4               | 4                 | 4                         | 4                    | 3                           | 3                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 2            |
| Xylol                           | 4               | 4                 | 1                         | 1                    | 4                           | 4                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 4            |
| Yeast                           | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | 3                  | 2              | 1              | ◇                             | ◇                           | X            |
| Zeolites                        | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | 1            |

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|----------------------------|-----------------|-------------------|---------------------------|----------------------|-----------------------------|----------------------|--------------------------|--------------------|----------------|----------------|-------------------------------|-----------------------------|--------------|
| Zinc Acetate               | 2               | 1                 | 4                         | 4                    | 2                           | 2                    | 1                        | 4                  | 4              | 1              | ◇                             | ◇                           | 3            |
| Zinc Ammonium Chloride     | X               | X                 | 3                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Zinc Chloride              | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Zinc Chromate              | X               | X                 | 3                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Zinc Cyanide               | X               | X                 | 3                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Zinc Diethldithiocarbamate | X               | X                 | 3                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Zinc Dihydrogen Phosphate  | 1               | 1                 | 3                         | 1                    | 3                           | 3                    | 1                        | 4                  | 2              | X              | ◇                             | ◇                           | X            |
| Zinc Hydrosulfite          | 1               | 1                 | 3                         | X                    | 3                           | 1                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Zinc Nitrate               | X               | X                 | 1                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Zinc Oxide                 | 1               | X                 | 1                         | X                    | X                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Zinc Phenosulonate         | X               | X                 | 3                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Zinc Phosphate             | X               | X                 | 1                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Zinc Salts                 | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Zinc Stearate              | X               | X                 | 3                         | X                    | 3                           | X                    | 1                        | X                  | X              | 1              | ◇                             | ◇                           | X            |
| Zinc Sulfate               | 2               | 1                 | 1                         | 1                    | 1                           | 1                    | 1                        | 2                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Zinc Sulfide               | X               | X                 | 3                         | X                    | 3                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |
| Zinc Sulphate              | 1               | 1                 | 1                         | 1                    | 1                           | 1                    | X                        | 1                  | 1              | 1              | ◇                             | ◇                           | 1            |
| Zinc Vitriol               | 1               | 1                 | 1                         | X                    | X                           | 1                    | X                        | X                  | 1              | 1              | ◇                             | ◇                           | X            |
| Zirconium Nitrate          | X               | X                 | 1                         | X                    | 1                           | X                    | 1                        | X                  | X              | X              | ◇                             | ◇                           | X            |



## Armor-O-Rings™ / PTFE-FEP Encapsulated O-Rings

Armor-O-Rings™ are produced using a thin PTFE shielded tubing fully encasing an elastomeric rubber-like core. The outer jacket protects the resilient core from the fluids which the O-Ring contacts. This unique combination enables the Armor-O-Ring to give maximum protection in even the harshest environment. PTFE is an ideal sealing material, however, it is not resilient by itself. The elastomeric core material, either silicone or Viton®, gives the outer PTFE shield



the memory required to effect a proper seal. It will provide an excellent seal in high temperatures, aggressive chemical exposure and still remain elastic.

The Armor-O-Ring™ style EO V and EO S have a PTFE-FEP jacket with a minimum thickness of .008". This casing is far superior to a simple coating of PTFE. Illustration (A) below show the typical wall thickness relative to the cross section of the

O-Ring. The PTFE shield is virtually chemically inert and resists most chemicals, except molten metals, fluorine at higher temperatures, and certain complex halogenated compounds.

**Illustration (A)**

| O-Ring Width<br>Inch | Wall Thickness<br>Inch |
|----------------------|------------------------|
| .070                 | .008                   |
| .103                 | .010                   |
| .139                 | .012                   |
| .210                 | .015                   |
| .275                 | .020                   |

| Width |        | Minimum I.D. |        |
|-------|--------|--------------|--------|
| MM    | Inches | MM           | Inches |
| 1.60  | 0.063  | 7.64         | 0.301  |
| 1.78  | 0.070  | 7.64         | 0.301  |
| 2.00  | 0.078  | 7.64         | 0.301  |
| 2.40  | 0.095  | 9.19         | 0.362  |
| 2.50  | 0.098  | 9.19         | 0.362  |
| 2.62  | 0.103  | 9.19         | 0.362  |
| 3.00  | 0.118  | 12.00        | 0.472  |
| 3.53  | 0.139  | 13.10        | 0.515  |
| 4.00  | 0.158  | 18.00        | 0.708  |
| 4.50  | 0.177  | 23.10        | 0.911  |
| 5.00  | 0.197  | 23.10        | 0.911  |
| 5.33  | 0.210  | 23.10        | 0.911  |
| 5.70  | 0.224  | 50.00        | 1.968  |
| 6.00  | 0.236  | 50.00        | 1.968  |
| 6.30  | 0.248  | 50.00        | 1.968  |
| 6.99  | 0.275  | 50.00        | 1.968  |
| 7.50  | 0.295  | 50.00        | 1.968  |
| 8.00  | 0.315  | 50.00        | 1.968  |
| 9.00  | 0.354  | 101.60       | 4.000  |
| 9.50  | 0.374  | 127.00       | 5.000  |
| 10.00 | 0.394  | 127.00       | 5.000  |
| 11.00 | 0.433  | 127.00       | 5.000  |
| 12.00 | 0.472  | 152.40       | 6.000  |

### Type Armor-O-Ring™ EO V

**Construction:** Core made using Viton® fluorolastomer core with PTFE-FEP encapsulation.

**Uses:** Chemically resistant to most fluids and gases, except molten alkali metals, fluorine at elevated temperatures and some complex halogens. Especially suited for oils and solvents.

**Temperature:** -40° to 205°C / -40° to 401°F

### Type Armor O-Ring™ EO S

**Construction:** Core made using silicone rubber core with PTFE-FEP encapsulation.

**Uses:** Excellent for cryogenic applications, broad chemical application and most any application requiring a resilient, chemical resistant seal.

**Temperature:** -73° to 205°C / -99° to 401°F



## Armor-O-Rings™ / PTFE-FEP Encapsulated O-Rings

### Where can Armor-O-Rings™ be used?

- **Flanges** - Excellent for grooved face flanges.
- **Valve Assemblies** - Superior performance to standard O-Rings contacting steam, air, gases and toxic, hazardous materials.



- **Tank Valves** - Broad range of chemical coverage reducing maintenance costs.
- **Mechanical Seals** - Internal O-Rings within the shaft seal, water to petrochemicals.
- **Pipe Fittings** - Versatile as an option to a flat gaskets - requires a groove.
- **Hose Coupling** - Special shapes for quick disconnect couplings.
- **Glassware** - Low compression for fragile flanges and fittings.
- **Food Equipment** - Suitable for food, beverage and pharmaceutical equipment.



## Armor-O-Rings™ Material Selection Guide

| Seal Material                                                                                                                                                                                                   | Hardness        |                                                                    | Color                    | Temperature Limits               | Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------|--------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                 | Machined O-Ring | Molded O-Ring                                                      |                          |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>EOS</b><br><b>Armor-O-Rings™ Silicone Core</b><br><br><b>Also referred to as:</b><br>Teflon® Encapsulated Silicone O-Rings,<br>PTFE Encapsulated Silicone O-Rings,<br>PTFE-FEP Encapsulated Silicone O-Rings | N/A             | 70 (core)                                                          | Orange with opaque shell | -40 to 401°F<br><br>-40 to 205°C | <p><b>Use in:</b> To improve O-Ring performance in difficult applications where silicone O-Rings alone fail.</p> <p><b>Description:</b> Armor-O-Rings™ EOS are produced using a thin PTFE shielded tubing fully encasing a silicone rubber core. The outer jacket protects the resilient silicone core from the fluids the O-Ring contacts.</p> <p><b>Characteristics:</b> Semi-rigid PTFE-FEP tubing fully encapsulating the silicone core material.</p> <p><b>Material:</b> PTFE-FEP jacket with a minimum thickness of .008" over a silicone core.</p> |
|                                                                                                                                                                                                                 |                 | See <a href="#">page 37</a> for a <a href="#">hardness scale</a> . |                          |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |



| Seal Material                                                                                                                                                                                     | Hardness        |                                                                    | Color                   | Temperature Limits               | Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------|-------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                   | Machined O-Ring | Molded O-Ring                                                      |                         |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>EOV</b><br><b>Armor-O-Rings™ Viton® Core</b><br><br><b>Also referred to as:</b><br>Teflon® Encapsulated Viton® O-Rings, PTFE Encapsulated Viton® O-Rings, PTFE-FEP Encapsulated Viton® O-Rings | N/A             | 75 (core)                                                          | Black with opaque shell | -99 to 401°F<br><br>-73 to 205°C | <p><b>Use in:</b> To improve O-Ring performance in difficult applications where Viton® alone fails.</p> <p><b>Description:</b> Armor-O-Rings™ EOV are produced using a thin PTFE shielded tubing fully encasing a Viton® elastomeric core. The outer jacket protects the resilient Viton® core from the fluids which the O-Ring contacts.</p> <p><b>Characteristics:</b> Semi-rigid PTFE-FEP tubing fully encapsulating the Viton® core material. Endless. No joints.</p> <p><b>Material:</b> PTFE-FEP jacket with a minimum thickness of .008" over a Viton® core.</p> |
|                                                                                                                                                                                                   |                 | See <a href="#">page 37</a> for a <a href="#">hardness scale</a> . |                         |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

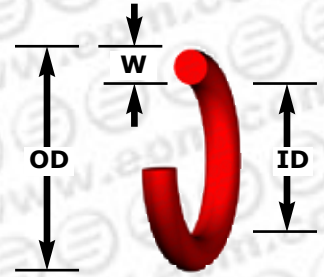




# Armor-O-Rings™ / PTFE-FEP Encapsulated O-Rings

## INCH SIZING CHART

[Click here](#) to see [pages 114-124](#) for an inch sizing chart.

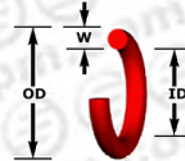


**O-Ring Sizes** - \*All inch sizes are in stock and ready to ship in NBR and VIT materials..

## INCH SIZING CHART (continued)



For Groove Dimensions see [pages 109-111](#).



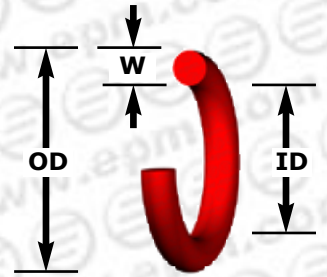
| AS568A Dash No. | Nominal Inch Size |        |       | Actual Size (inch) |           | Actual Size (in mm's) |           |
|-----------------|-------------------|--------|-------|--------------------|-----------|-----------------------|-----------|
|                 | I.D.              | O.D.   | Width | I.D.               | Width     | I.D.                  | Width     |
| -021            | 15/16             | 1-1/16 | 1/16  | .926±.009          | .070±.003 | 23.52±0.23            | 1.78±0.08 |
| -022            | 1                 | 1-1/8  | 1/16  | .989±.010          | .070±.003 | 25.12±0.25            | 1.78±0.08 |
| -023            | 1-1/16            | 1-3/16 | 1/16  | 1.051±.010         | .070±.003 | 26.70±0.25            | 1.78±0.08 |
| -024            | 1-1/8             | 1-1/4  | 1/16  | 1.114±.010         | .070±.003 | 28.30±0.25            | 1.78±0.08 |
| -025            | 1-3/16            | 1-5/16 | 1/16  | 1.176±.011         | .070±.003 | 29.87±0.28            | 1.78±0.08 |
| -026            | 1-1/4             | 1-3/8  | 1/32  | 1.239±.011         | .070±.003 | 31.47±0.28            | 1.78±0.08 |
| -027            | 1-5/16            | 1-7/16 | 3/64  | 1.301±.011         | .070±.003 | 33.05±0.28            | 1.78±0.08 |
| -028            | 1-3/8             | 1-1/2  | 1/16  | 1.364±.013         | .070±.003 | 34.65±0.33            | 1.78±0.08 |
| -029            | 1-1/2             | 1-5/8  | 1/16  | 1.489±.013         | .070±.003 | 37.82±0.33            | 1.78±0.08 |
| -030            | 1-5/8             | 1-3/4  | 1/16  | 1.614±.013         | .070±.003 | 41.00±0.33            | 1.78±0.08 |
| -031            | 1-3/4             | 1-7/8  | 1/16  | 1.739±.015         | .070±.003 | 44.17±0.38            | 1.78±0.08 |
| -032            | 1-7/8             | 2      | 1/16  | 1.864±.015         | .070±.003 | 47.35±0.38            | 1.78±0.08 |
| -033            | 2                 | 2-1/8  | 1/16  | 1.989±.018         | .070±.003 | 50.52±0.46            | 1.78±0.08 |
| -034            | 2-1/8             | 2-1/4  | 1/16  | 2.114±.018         | .070±.003 | 53.70±0.46            | 1.78±0.08 |
| -035            | 2-1/4             | 2-3/8  | 1/16  | 2.239±.018         | .070±.003 | 56.87±0.46            | 1.78±0.08 |
| -036            | 2-3/8             | 2-1/2  | 1/16  | 2.364±.018         | .070±.003 | 60.05±0.46            | 1.78±0.08 |
| -037            | 2-1/2             | 2-5/8  | 1/16  | 2.489±.018         | .070±.003 | 63.22±0.46            | 1.78±0.08 |
| -038            | 2-5/8             | 2-3/4  | 1/16  | 2.614±.020         | .070±.003 | 66.40±0.51            | 1.78±0.08 |
| -039            | 2-3/4             | 2-7/8  | 1/16  | 2.739±.020         | .070±.003 | 69.57±0.51            | 1.78±0.08 |
| -040            | 2-7/8             | 3      | 1/16  | 2.864±.020         | .070±.003 | 72.75±0.51            | 1.78±0.08 |
| -041            | 3                 | 3-1/8  | 1/16  | 2.989±.024         | .070±.003 | 75.92±0.61            | 1.78±0.08 |
| -042            | 3-1/4             | 3-3/8  | 1/16  | 3.239±.024         | .070±.003 | 82.27±0.61            | 1.78±0.08 |
| -043            | 3-1/2             | 3-5/8  | 1/16  | 3.489±.024         | .070±.003 | 88.62±0.61            | 1.78±0.08 |
| -044            | 3-3/4             | 3-7/8  | 1/16  | 3.739±.027         | .070±.003 | 94.97±0.69            | 1.78±0.08 |
| -045            | 4                 | 4-1/8  | 1/16  | 3.989±.027         | .070±.003 | 101.32±0.69           | 1.78±0.08 |
| -046            | 4-1/4             | 4-3/8  | 1/16  | 4.239±.030         | .070±.003 | 107.67±0.76           | 1.78±0.08 |
| -047            | 4-1/2             | 4-5/8  | 1/16  | 4.489±.030         | .070±.003 | 114.02±0.76           | 1.78±0.08 |
| -048            | 4-3/4             | 4-7/8  | 1/16  | 4.739±.033         | .070±.003 | 120.37±0.83           | 1.78±0.08 |
| -049            | 5                 | 5-1/8  | 1/16  | 4.989±.033         | .070±.003 | 126.72±0.83           | 1.78±0.08 |
| -050            | 5                 | 5-1/8  | 1/16  | 4.989±.033         | .070±.003 | 126.72±0.83           | 1.78±0.08 |

[Click here](#) to see [pages 114-124](#) for an inch sizing chart.

# Armor-O-Rings™ / PTFE-FEP Encapsulated O-Rings

## METRIC SIZING CHART

[Click here](#) to see [pages 125-158](#) for a metric sizing chart.

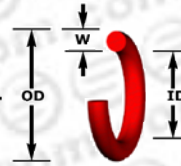


**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

### METRIC SIZING CHART



For [Groove Dimensions](#) see [pages 109-111](#).



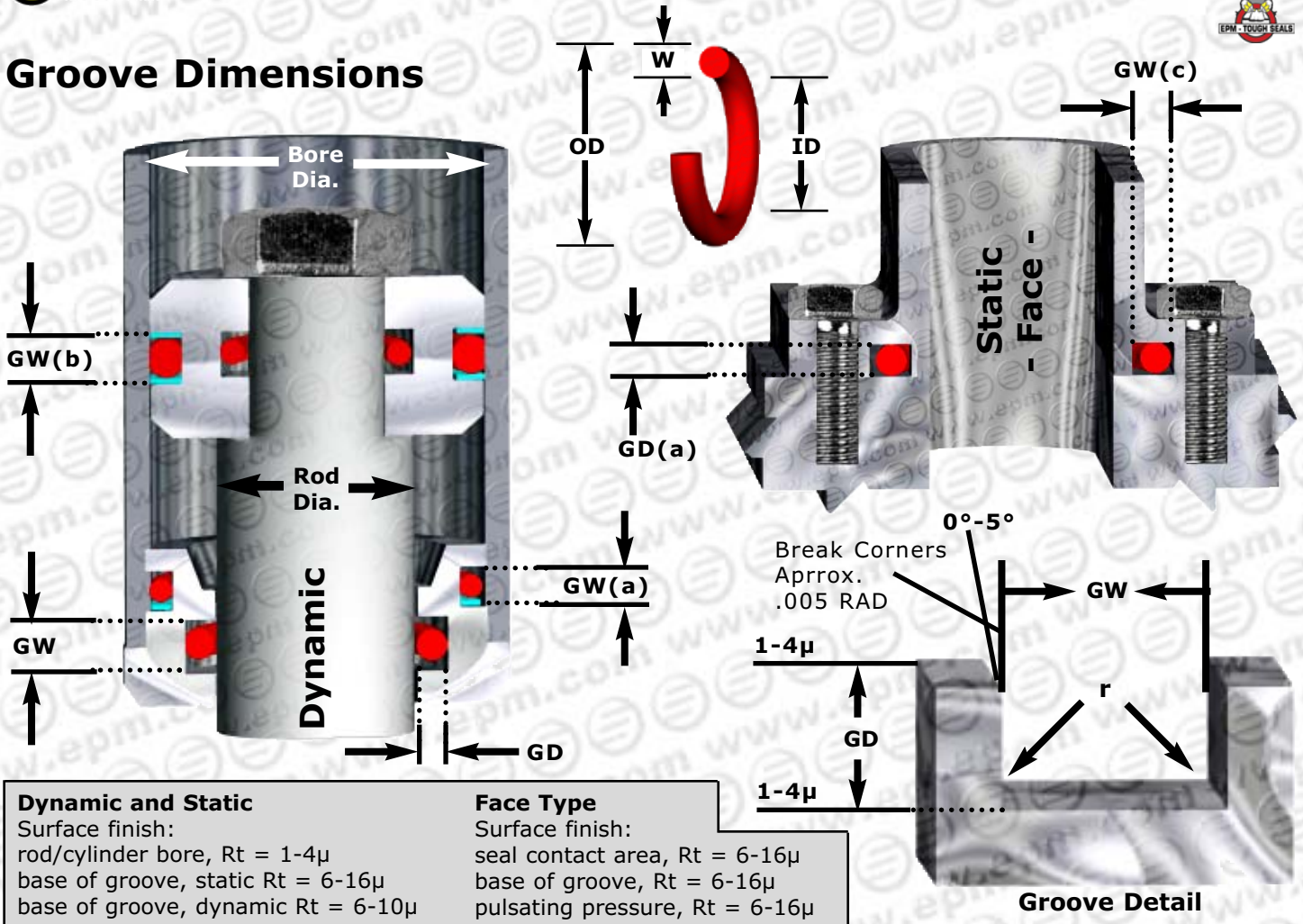
| Width (mm)  | I.D. (mm)    | Cross Ref. |
|-------------|--------------|------------|
| 1.00        | 1.15         | -          |
| 1.00        | 1.25         | -          |
| <b>1.00</b> | <b>1.50</b>  | -          |
| 1.00        | 1.80         | -          |
| <b>1.00</b> | <b>2.00</b>  | -          |
| <b>1.00</b> | <b>2.50</b>  | -          |
| 1.00        | 2.70         | -          |
| <b>1.00</b> | <b>3.00</b>  | -          |
| 1.00        | 3.30         | -          |
| <b>1.00</b> | <b>3.50</b>  | -          |
| <b>1.00</b> | <b>4.00</b>  | -          |
| <b>1.00</b> | <b>4.50</b>  | -          |
| <b>1.00</b> | <b>5.00</b>  | -          |
| <b>1.00</b> | <b>5.50</b>  | -          |
| <b>1.00</b> | <b>6.00</b>  | -          |
| <b>1.00</b> | <b>6.50</b>  | -          |
| <b>1.00</b> | <b>7.00</b>  | -          |
| 1.00        | 7.20         | -          |
| <b>1.00</b> | <b>7.50</b>  | -          |
| <b>1.00</b> | <b>8.00</b>  | -          |
| <b>1.00</b> | <b>8.50</b>  | -          |
| <b>1.00</b> | <b>9.00</b>  | -          |
| <b>1.00</b> | <b>9.50</b>  | -          |
| <b>1.00</b> | <b>10.00</b> | -          |
| <b>1.00</b> | <b>10.50</b> | -          |
| <b>1.00</b> | <b>11.00</b> | -          |
| <b>1.00</b> | <b>11.50</b> | -          |
| <b>1.00</b> | <b>12.00</b> | -          |
| <b>1.00</b> | <b>12.50</b> | -          |

| Width (mm)  | I.D. (mm)    | Cross Ref. |
|-------------|--------------|------------|
| <b>1.00</b> | <b>13.50</b> | -          |
| <b>1.00</b> | <b>14.00</b> | -          |
| <b>1.00</b> | <b>14.50</b> | -          |
| <b>1.00</b> | <b>15.00</b> | -          |
| <b>1.00</b> | <b>15.50</b> | -          |
| <b>1.00</b> | <b>16.00</b> | -          |
| <b>1.00</b> | <b>16.50</b> | -          |
| <b>1.00</b> | <b>17.00</b> | -          |
| <b>1.00</b> | <b>17.50</b> | -          |
| <b>1.00</b> | <b>18.00</b> | -          |
| <b>1.00</b> | <b>18.50</b> | -          |
| <b>1.00</b> | <b>19.00</b> | -          |
| <b>1.00</b> | <b>19.50</b> | -          |
| <b>1.00</b> | <b>20.00</b> | -          |
| <b>1.00</b> | <b>20.50</b> | -          |
| <b>1.00</b> | <b>21.00</b> | -          |
| <b>1.00</b> | <b>21.50</b> | -          |
| <b>1.00</b> | <b>22.00</b> | -          |
| <b>1.00</b> | <b>22.50</b> | -          |
| <b>1.00</b> | <b>23.00</b> | -          |
| <b>1.00</b> | <b>23.50</b> | -          |
| <b>1.00</b> | <b>24.00</b> | -          |
| <b>1.00</b> | <b>24.50</b> | -          |
| <b>1.00</b> | <b>25.00</b> | -          |
| 1.00        | 28.00        | -          |
| 1.00        | 29.40        | -          |
| 1.00        | 29.00        | -          |

| Width (mm)  | I.D. (mm)    | Cross Ref. |
|-------------|--------------|------------|
| 1.19        | 4.32         | -          |
| 1.20        | 2.50         | -          |
| 1.20        | 2.60         | -          |
| 1.20        | 3.50         | -          |
| 1.20        | 5.00         | -          |
| 1.20        | 24.00        | -          |
| 1.20        | 26.00        | -          |
| 1.20        | 28.00        | -          |
| 1.20        | 35.00        | -          |
| 1.20        | 40.00        | -          |
| 1.20        | 53.50        | -          |
| 1.20        | 98.00        | -          |
| 1.25        | 3.80         | -          |
| 1.25        | 8.00         | -          |
| 1.25        | 16.00        | -          |
| 1.27        | 3.25         | -          |
| 1.27        | 3.91         | -          |
| 1.27        | 4.47         | -          |
| 1.30        | 2.50         | -          |
| 1.30        | 8.00         | -          |
| 1.30        | 10.00        | -          |
| <b>1.30</b> | <b>11.00</b> | -          |
| 1.30        | 13.50        | -          |
| 1.30        | 20.00        | -          |
| 1.30        | 1.80         | -          |

[Click here](#) to see [pages 125-158](#) for a metric sizing chart.

# Groove Dimensions

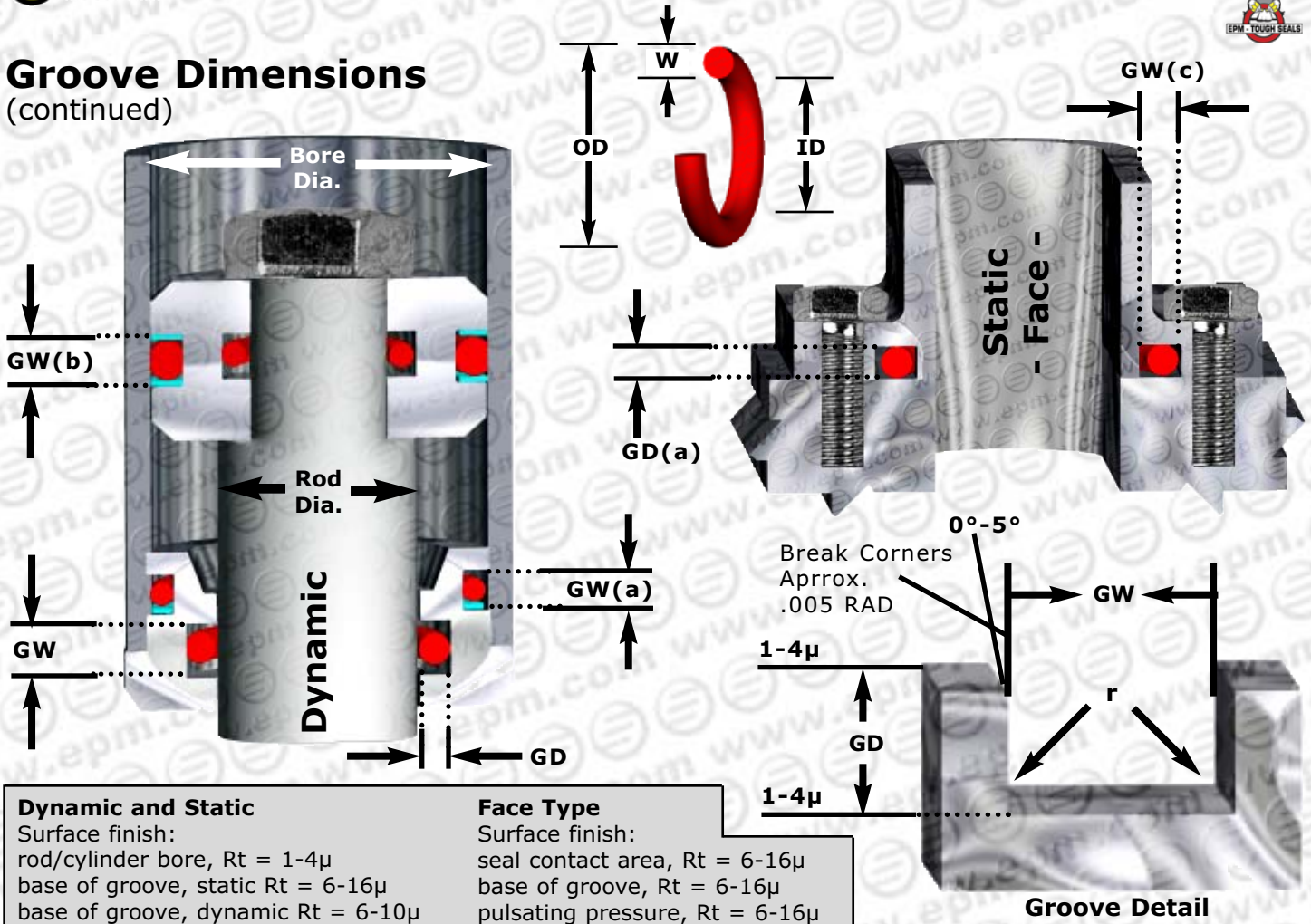


|                                                                                                                                                                    |                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Dynamic and Static</b><br/>Surface finish:<br/>rod/cylinder bore, Rt = 1-4µ<br/>base of groove, static Rt = 6-16µ<br/>base of groove, dynamic Rt = 6-10µ</p> | <p><b>Face Type</b><br/>Surface finish:<br/>seal contact area, Rt = 6-16µ<br/>base of groove, Rt = 6-16µ<br/>pulsating pressure, Rt = 6-16µ</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|

| Inch O-Ring<br><br>W | Metric O-Ring<br><br>W | Dynamic and Static                           |                        |                             |                             | Face Type                               |                                         | Radius               |                   |
|----------------------|------------------------|----------------------------------------------|------------------------|-----------------------------|-----------------------------|-----------------------------------------|-----------------------------------------|----------------------|-------------------|
|                      |                        | Groove Depth<br><br>GD + 0.06<br>Tol. + 0.06 | Groove Width           |                             |                             | Groove Depth<br><br>GD(a)<br>Tol. + 0.1 | Groove Width<br><br>GW(c)<br>Tol. + 0.2 | Without Back-up Ring | With Back-up Ring |
|                      |                        |                                              | GW + 0.2<br>Tol. + 0.2 | GW(a)<br>1 BU<br>Tol. + 0.2 | GW(b)<br>2 BU<br>Tol. + 0.2 |                                         |                                         |                      |                   |
| -                    | 1.00                   | 0.80                                         | 1.40                   | -                           | -                           | 0.65                                    | 1.40                                    | 0.2                  | 0.2               |
| -                    | 1.02                   | 0.80                                         | 1.40                   | -                           | -                           | 0.65                                    | 1.40                                    | 0.2                  | 0.2               |
| -                    | 1.10                   | 0.90                                         | 1.50                   | -                           | -                           | 0.75                                    | 1.50                                    | 0.2                  | 0.2               |
| -                    | 1.12                   | 0.90                                         | 1.50                   | -                           | -                           | 0.75                                    | 1.50                                    | 0.2                  | 0.2               |
| -                    | 1.15                   | 0.90                                         | 1.50                   | -                           | -                           | 0.75                                    | 1.50                                    | 0.2                  | 0.2               |
| -                    | 1.20                   | 0.95                                         | 1.70                   | -                           | -                           | 0.80                                    | 1.70                                    | 0.2                  | 0.2               |
| -                    | 1.25                   | 1.00                                         | 1.80                   | -                           | -                           | 0.85                                    | 1.80                                    | 0.2                  | 0.2               |
| -                    | 1.27                   | 1.00                                         | 1.80                   | -                           | -                           | 0.85                                    | 1.80                                    | 0.2                  | 0.2               |
| -                    | 1.30                   | 1.05                                         | 1.80                   | -                           | -                           | 0.90                                    | 1.80                                    | 0.2                  | 0.2               |
| -                    | 1.42                   | 1.15                                         | 1.90                   | -                           | -                           | 0.95                                    | 1.90                                    | 0.2                  | 0.2               |
| -                    | 1.45                   | 1.15                                         | 1.90                   | -                           | -                           | 0.95                                    | 1.90                                    | 0.2                  | 0.2               |
| -                    | 1.60                   | 1.30                                         | 2.20                   | -                           | -                           | 1.10                                    | 2.20                                    | 0.3                  | 0.2               |
| .070" (1/16")        | 1.78                   | 1.45                                         | 2.40                   | 3.80                        | 5.20                        | 1.20                                    | 2.40                                    | 0.4                  | 0.2               |
| -                    | 1.80                   | 1.45                                         | 2.40                   | 3.80                        | 5.20                        | 1.20                                    | 2.40                                    | 0.4                  | 0.2               |
| -                    | 1.90                   | 1.65                                         | 2.50                   | 3.90                        | 5.30                        | 1.40                                    | 2.50                                    | 0.5                  | 0.2               |
| -                    | 2.00                   | 1.65                                         | 2.50                   | 3.90                        | 5.30                        | 1.40                                    | 2.50                                    | 0.5                  | 0.2               |

Note: 1µ ≈ 4√ ≈ 4RMS ≈ 4 micro inches

**Groove Dimensions**  
(continued)

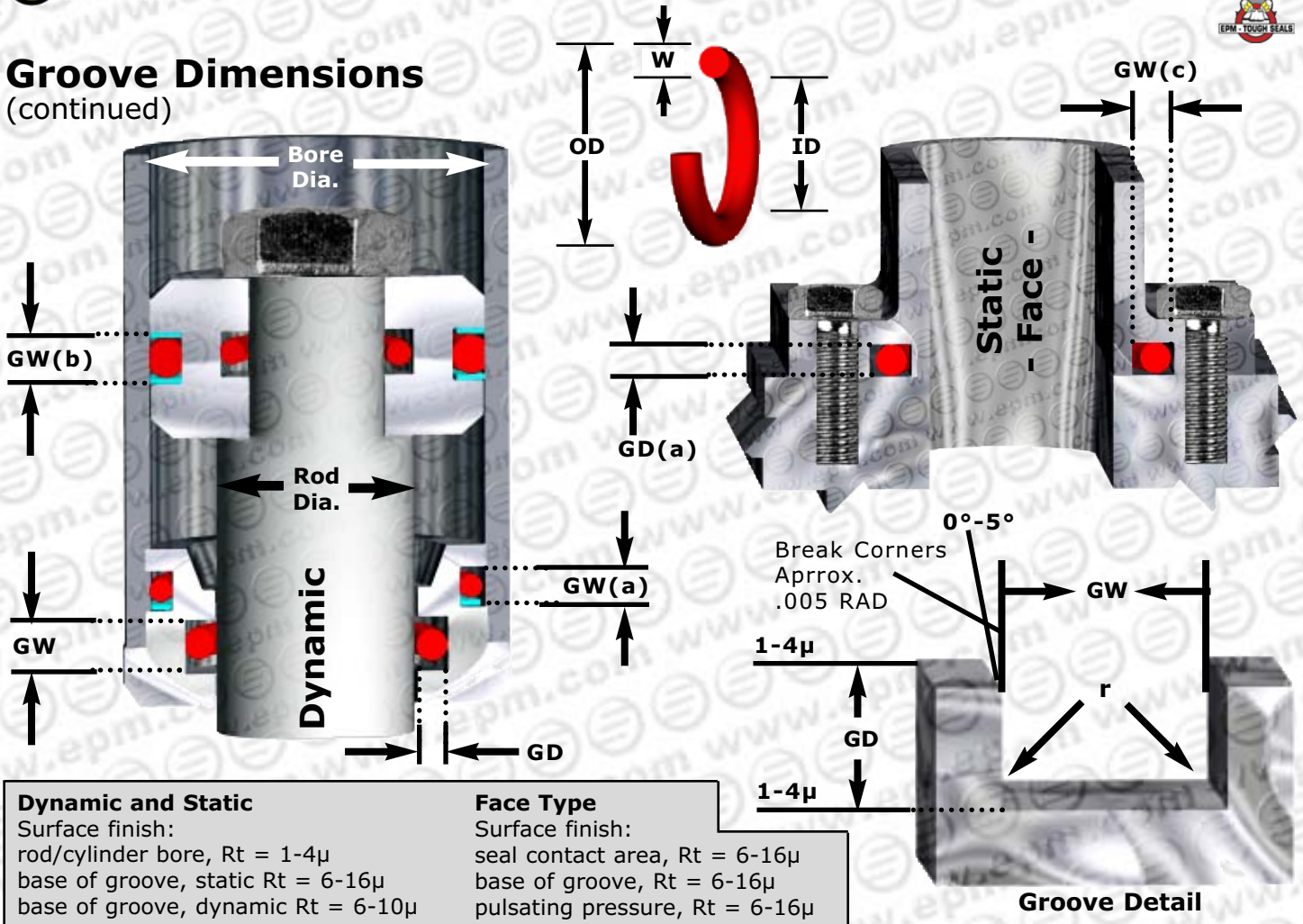


|                                                                                                                                                                    |                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Dynamic and Static</b><br/>Surface finish:<br/>rod/cylinder bore, Rt = 1-4µ<br/>base of groove, static Rt = 6-16µ<br/>base of groove, dynamic Rt = 6-10µ</p> | <p><b>Face Type</b><br/>Surface finish:<br/>seal contact area, Rt = 6-16µ<br/>base of groove, Rt = 6-16µ<br/>pulsating pressure, Rt = 6-16µ</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|

| Inch O-Ring<br><br>W | Metric O-Ring<br><br>W | Dynamic and Static                           |              |                             |                             | Face Type                               |                                         | Radius               |                   |
|----------------------|------------------------|----------------------------------------------|--------------|-----------------------------|-----------------------------|-----------------------------------------|-----------------------------------------|----------------------|-------------------|
|                      |                        | Groove Depth<br><br>GD + 0.06<br>Tol. + 0.06 | Groove Width |                             |                             | Groove Depth<br><br>GD(a)<br>Tol. + 0.1 | Groove Width<br><br>GW(c)<br>Tol. + 0.2 | Without Back-up Ring | With Back-up Ring |
|                      |                        |                                              | Tol. + 0.2   | GW(a)<br>1 BU<br>Tol. + 0.2 | GW(b)<br>2 BU<br>Tol. + 0.2 |                                         |                                         |                      |                   |
| -                    | 2.20                   | 1.85                                         | 2.90         | 4.30                        | 5.70                        | 1.55                                    | 2.90                                    | 0.5                  | 0.3               |
| -                    | 2.40                   | 2.00                                         | 3.20         | 4.60                        | 6.00                        | 1.70                                    | 3.20                                    | 0.5                  | 0.3               |
| -                    | 2.50                   | 2.10                                         | 3.40         | 4.80                        | 6.20                        | 1.80                                    | 3.40                                    | 0.5                  | 0.3               |
| .103" (3/32")        | 2.62                   | 2.25                                         | 3.60         | 5.00                        | 6.40                        | 1.90                                    | 3.60                                    | 0.6                  | 0.3               |
| -                    | 2.65                   | 2.25                                         | 3.60         | 5.00                        | 6.40                        | 1.90                                    | 3.60                                    | 0.6                  | 0.3               |
| -                    | 2.70                   | 2.30                                         | 3.70         | 5.10                        | 6.50                        | 1.95                                    | 3.70                                    | 0.6                  | 0.3               |
| -                    | 3.00                   | 2.50                                         | 3.90         | 5.30                        | 6.70                        | 2.20                                    | 3.90                                    | 0.8                  | 0.3               |
| -                    | 3.10                   | 2.70                                         | 4.00         | 5.40                        | 6.80                        | 2.30                                    | 4.00                                    | 0.8                  | 0.4               |
| -                    | 3.50                   | 3.10                                         | 4.80         | 6.20                        | 7.60                        | 2.70                                    | 4.80                                    | 1.0                  | 0.4               |
| .139" (1/8")         | 3.53                   | 3.10                                         | 4.80         | 6.20                        | 7.60                        | 2.70                                    | 4.80                                    | 1.0                  | 0.4               |
| -                    | 3.55                   | 3.10                                         | 4.80         | 6.20                        | 7.60                        | 2.70                                    | 4.80                                    | 1.0                  | 0.4               |
| -                    | 4.00                   | 3.50                                         | 5.40         | 7.10                        | 8.80                        | 3.10                                    | 5.40                                    | 1.0                  | 0.4               |
| -                    | 4.50                   | 4.00                                         | 6.00         | 7.70                        | 9.40                        | 3.40                                    | 6.00                                    | 1.0                  | 0.4               |
| -                    | 5.00                   | 4.30                                         | 6.70         | 8.40                        | 10.10                       | 3.90                                    | 6.70                                    | 1.0                  | 0.4               |
| .210" (3/16")        | 5.33                   | 4.70                                         | 7.10         | 8.80                        | 10.50                       | 4.30                                    | 7.10                                    | 1.2                  | 0.6               |
| -                    | 5.50                   | 4.80                                         | 7.30         | 9.00                        | 10.70                       | 4.40                                    | 7.30                                    | 1.2                  | 0.6               |

Note: 1µ ≈ 4√ ≈ 4RMS ≈ 4 micro inches

**Groove Dimensions**  
(continued)

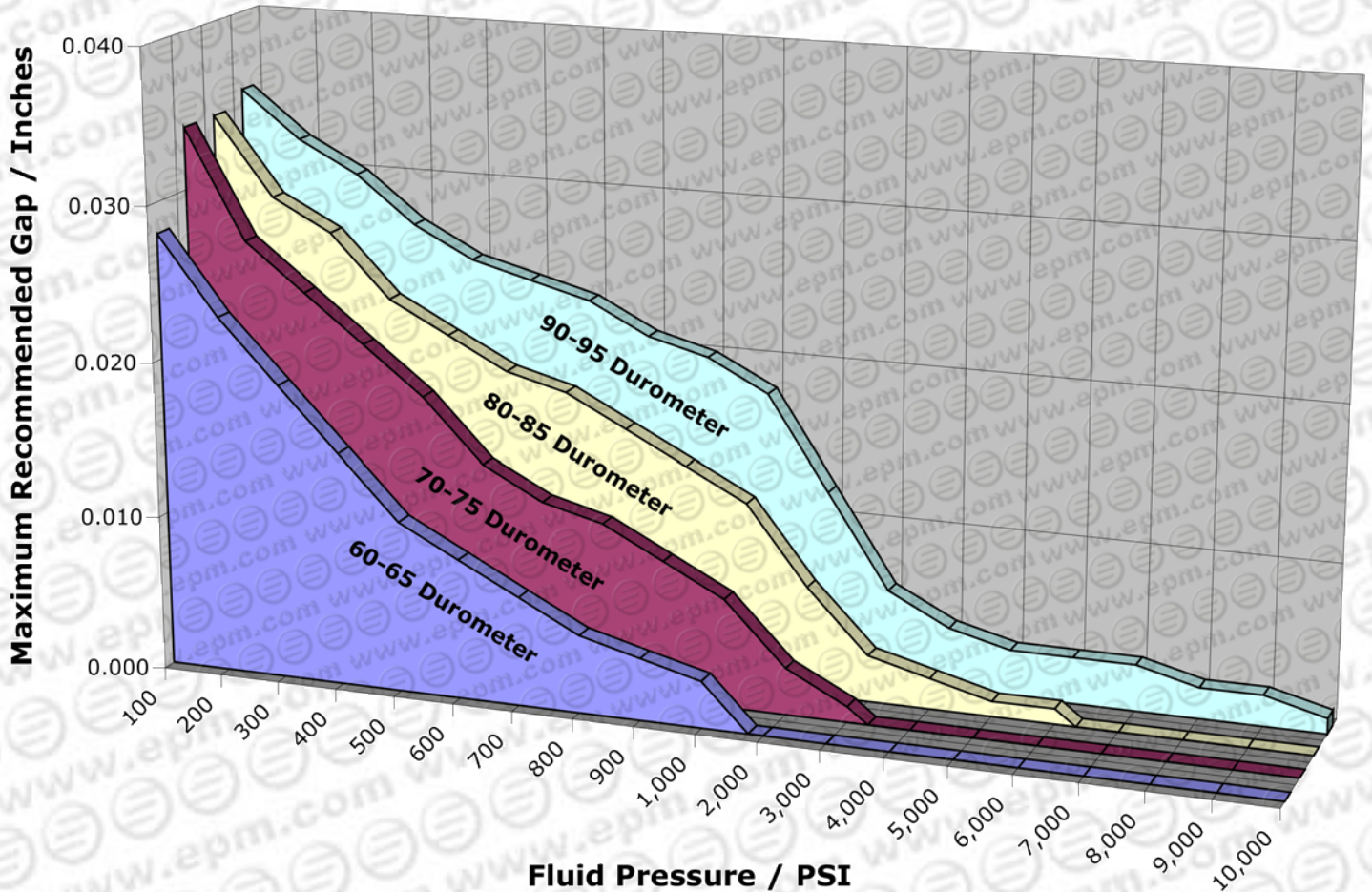


|                                                                                                                                                                    |                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Dynamic and Static</b><br/>Surface finish:<br/>rod/cylinder bore, Rt = 1-4µ<br/>base of groove, static Rt = 6-16µ<br/>base of groove, dynamic Rt = 6-10µ</p> | <p><b>Face Type</b><br/>Surface finish:<br/>seal contact area, Rt = 6-16µ<br/>base of groove, Rt = 6-16µ<br/>pulsating pressure, Rt = 6-16µ</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|

| Inch O-Ring<br><br>W | Metric O-Ring<br><br>W | Dynamic and Static                           |              |                             |                             | Face Type                               |                                         | Radius               |                   |
|----------------------|------------------------|----------------------------------------------|--------------|-----------------------------|-----------------------------|-----------------------------------------|-----------------------------------------|----------------------|-------------------|
|                      |                        | Groove Depth<br><br>GD + 0.06<br>Tol. + 0.06 | Groove Width |                             |                             | Groove Depth<br><br>GD(a)<br>Tol. + 0.1 | Groove Width<br><br>GW(c)<br>Tol. + 0.2 | Without Back-up Ring | With Back-up Ring |
|                      |                        |                                              | Tol. + 0.2   | GW(a)<br>1 BU<br>Tol. + 0.2 | GW(b)<br>2 BU<br>Tol. + 0.2 |                                         |                                         |                      |                   |
| -                    | 5.70                   | 5.00                                         | 7.70         | 9.40                        | 11.10                       | 4.60                                    | 7.70                                    | 1.2                  | 0.6               |
| -                    | 6.00                   | 5.30                                         | 8.20         | 9.90                        | 11.60                       | 4.80                                    | 8.20                                    | 1.2                  | 0.6               |
| .275" (1/4")         | 6.99                   | 6.10                                         | 9.50         | 12.00                       | 14.50                       | 5.80                                    | 9.50                                    | 1.5                  | 0.6               |
| -                    | 7.00                   | 6.10                                         | 9.50         | 12.00                       | 14.50                       | 5.80                                    | 9.50                                    | 1.5                  | 0.6               |
| -                    | 7.20                   | 6.20                                         | 9.80         | 12.30                       | 14.80                       | 5.90                                    | 9.80                                    | 1.5                  | 0.6               |
| -                    | 7.50                   | 6.50                                         | 14.40        | 12.90                       | 15.40                       | 6.20                                    | 10.40                                   | 1.5                  | 0.6               |
| -                    | 8.00                   | 7.00                                         | 11.00        | 13.50                       | 16.00                       | 6.60                                    | 11.00                                   | 1.5                  | 0.6               |
| -                    | 8.40                   | 7.50                                         | 11.70        | 14.20                       | 16.70                       | 6.90                                    | 11.70                                   | 2.0                  | 0.6               |
| -                    | 9.00                   | 7.80                                         | 12.50        | 15.00                       | 17.50                       | 7.40                                    | 12.50                                   | 2.0                  | 0.6               |
| -                    | 9.50                   | 8.30                                         | 13.30        | 15.80                       | 18.30                       | 7.80                                    | 13.30                                   | 2.0                  | 0.6               |
| -                    | 10.00                  | 8.70                                         | 13.50        | 16.00                       | 18.50                       | 8.30                                    | 13.50                                   | 2.0                  | 0.6               |
| -                    | 11.00                  | 9.60                                         | 15.50        | 18.00                       | 20.50                       | 9.10                                    | 15.50                                   | 3.0                  | 0.6               |
| -                    | 12.00                  | 10.50                                        | 16.80        | 19.30                       | 21.80                       | 10.30                                   | 16.80                                   | 3.0                  | 0.6               |
| -                    | 14.00                  | 12.20                                        | 19.00        | 21.50                       | 24.00                       | 11.60                                   | 19.00                                   | 3.0                  | 0.6               |
| -                    | 15.00                  | 13.20                                        | 20.00        | 22.50                       | 25.00                       | 12.50                                   | 20.00                                   | 3.0                  | 0.6               |
| -                    | 16.00                  | 14.00                                        | 21.50        | 24.00                       | 26.50                       | 13.50                                   | 21.50                                   | 3.0                  | 0.6               |

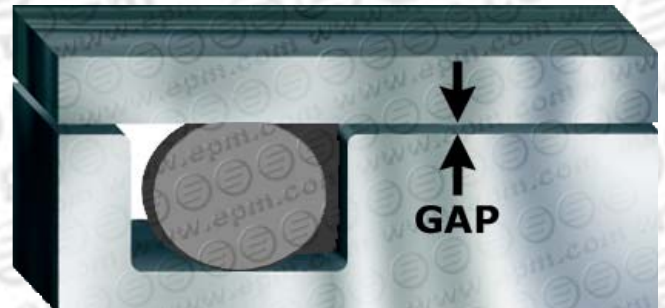
Note: 1µ ≈ 4√- ≈ 4RMS ≈ 4 micro inches

# O-Ring Material Rankings by Maximum Recommended Gap Clearance in Inches Based on O-Ring Durometer and Fluid Pressure (see [page 37](#))



**Table Legend**  
- Shore A Durometer Scale -

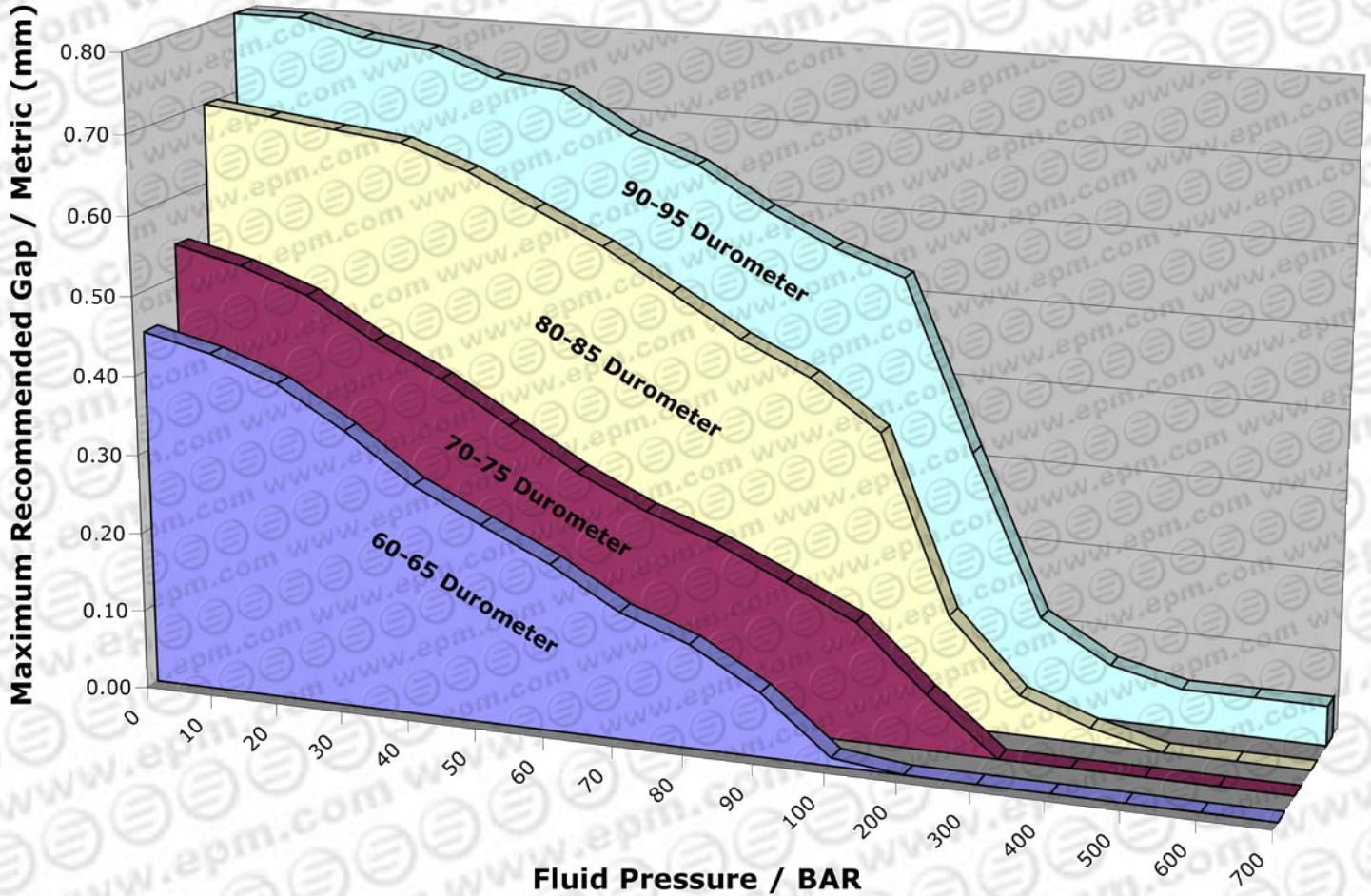
|                 |                 |
|-----------------|-----------------|
| 60-65 Durometer | 70-75 Durometer |
| 80-85 Durometer | 90-95 Durometer |



**Note: 1 Bar ≈ 14.5 PSI**

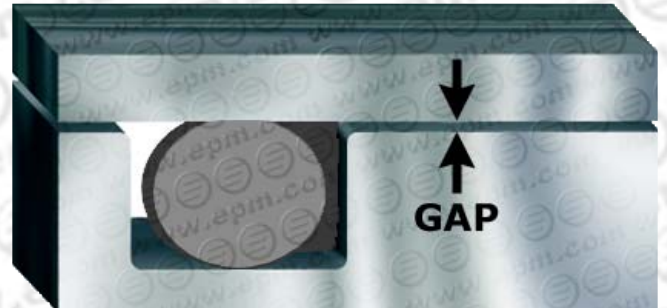


# O-Ring Material Rankings by Maximum Recommended Gap Clearance in Metric (mm) Based on O-Ring Durometer and Fluid Pressure (see [page 37](#))



**Table Legend**  
- Shore A Durometer Scale -

|                 |                 |
|-----------------|-----------------|
| 60-65 Durometer | 70-75 Durometer |
| 80-85 Durometer | 90-95 Durometer |



**Note: 1 Bar ≈ 14.5 PSI**



## O-Ring Sizes

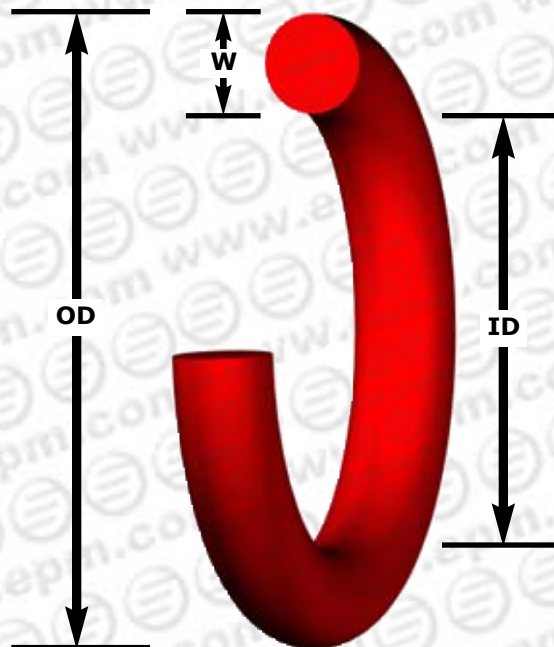
O-Ring seals have been standardized under the basic industrial standard dimensions of AS568, Aerospace Standard published by the Society of Automotive Engineers, and a multitude of military standards; AN6227 and MS28775 for general use; M25988, M83248, MS9020, MS9355, and MS29512 for straight-thread tube fittings; and MS28900 for electrical connectors.

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

### Available Sizes

An inch sizing chart is provided below.

See [pages 125-158](#) for a full range of [metric sizes](#).



## INCH SIZING CHART

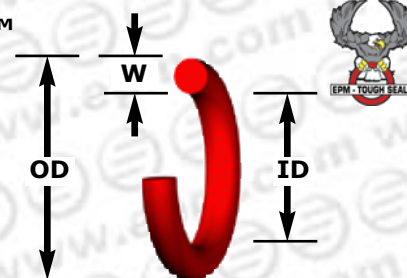
**\*All inch sizes are in stock and ready to ship in NBR and VIT materials.**



For [Groove Dimensions](#) see [pages 109-113](#).

| AS568A Dash No. | Nominal Inch Size |       |       | Actual O-Ring Size (in) |           | Actual O-Ring Size (mm) |           |
|-----------------|-------------------|-------|-------|-------------------------|-----------|-------------------------|-----------|
|                 | I.D.              | O.D.  | Width | I.D.                    | Width     | I.D.                    | Width     |
| -001            | 1/32              | 3/32  | 1/32  | .029±.004               | .040±.003 | 0.74±0.10               | 1.02±0.08 |
| -002            | 3/64              | 9/64  | 3/64  | .042±.004               | .050±.003 | 1.07±0.10               | 1.27±0.08 |
| -003            | 1/16              | 3/16  | 1/16  | .056±.004               | .060±.003 | 1.42±0.10               | 1.52±0.08 |
| -004            | 5/64              | 13/64 | 1/16  | .070±.005               | .070±.003 | 1.78±0.13               | 1.78±0.08 |
| -005            | 3/32              | 7/32  | 1/16  | .101±.005               | .070±.003 | 2.57±0.13               | 1.78±0.08 |
| -006            | 1/8               | 1/4   | 1/16  | .114±.005               | .070±.003 | 2.90±0.13               | 1.78±0.08 |
| -007            | 5/32              | 9/32  | 1/16  | .145±.005               | .070±.003 | 3.68±0.13               | 1.78±0.08 |
| -008            | 3/16              | 5/16  | 1/16  | .176±.005               | .070±.003 | 4.47±0.13               | 1.78±0.08 |
| -009            | 7/32              | 11/32 | 1/16  | .208±.005               | .070±.003 | 5.28±0.13               | 1.78±0.08 |
| -010            | 1/4               | 3/8   | 1/16  | .239±.005               | .070±.003 | 6.07±0.13               | 1.78±0.08 |
| -011            | 5/16              | 7/16  | 1/16  | .301±.005               | .070±.003 | 7.65±0.13               | 1.78±0.08 |
| -012            | 3/8               | 1/2   | 1/16  | .364±.005               | .070±.003 | 9.25±0.13               | 1.78±0.08 |
| -013            | 7/16              | 9/16  | 1/16  | .426±.005               | .070±.003 | 10.82±0.13              | 1.78±0.08 |
| -014            | 1/2               | 5/8   | 1/16  | .489±.005               | .070±.003 | 12.42±0.13              | 1.78±0.08 |
| -015            | 9/16              | 11/16 | 1/16  | .551±.007               | .070±.003 | 14.00±0.18              | 1.78±0.08 |
| -016            | 5/8               | 3/4   | 1/16  | .614±.009               | .070±.003 | 15.60±0.23              | 1.78±0.08 |
| -017            | 11/16             | 13/16 | 1/16  | .676±.009               | .070±.003 | 17.17±0.23              | 1.78±0.08 |
| -018            | 3/4               | 7/8   | 1/16  | .739±.009               | .070±.003 | 18.77±0.23              | 1.78±0.08 |
| -019            | 13/16             | 15/16 | 1/16  | .801±.009               | .070±.003 | 20.35±0.23              | 1.78±0.08 |
| -020            | 7/8               | 1     | 1/16  | .864±.009               | .070±.003 | 21.95±0.23              | 1.78±0.08 |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**



**O-Ring Sizes** - \*All inch sizes are in stock and ready to ship in NBR and VIT materials..

**I N C H**

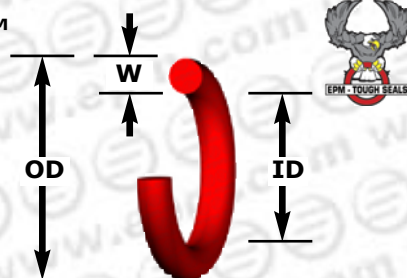
**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).

| AS568A Dash No. | Nominal Inch Size |        |       | Actual O-Ring Size (in) |           | Actual O-Ring Size (mm) |           |
|-----------------|-------------------|--------|-------|-------------------------|-----------|-------------------------|-----------|
|                 | I.D.              | O.D.   | Width | I.D.                    | Width     | I.D.                    | Width     |
| -021            | 15/16             | 1-1/16 | 1/16  | .926±.009               | .070±.003 | 23.52±0.23              | 1.78±0.08 |
| -022            | 1                 | 1-1/8  | 1/16  | .989±.010               | .070±.003 | 25.12±0.25              | 1.78±0.08 |
| -023            | 1-1/16            | 1-3/16 | 1/16  | 1.051±.010              | .070±.003 | 26.70±0.25              | 1.78±0.08 |
| -024            | 1-1/8             | 1-1/4  | 1/16  | 1.114±.010              | .070±.003 | 28.30±0.25              | 1.78±0.08 |
| -025            | 1-3/16            | 1-5/16 | 1/16  | 1.176±.011              | .070±.003 | 29.87±0.28              | 1.78±0.08 |
| -026            | 1-1/4             | 1-3/8  | 1/32  | 1.239±.011              | .070±.003 | 31.47±0.28              | 1.78±0.08 |
| -027            | 1-5/16            | 1-7/16 | 3/64  | 1.301±.011              | .070±.003 | 33.05±0.28              | 1.78±0.08 |
| -028            | 1-3/8             | 1-1/2  | 1/16  | 1.364±.013              | .070±.003 | 34.65±0.33              | 1.78±0.08 |
| -029            | 1-1/2             | 1-5/8  | 1/16  | 1.489±.013              | .070±.003 | 37.82±0.33              | 1.78±0.08 |
| -030            | 1-5/8             | 1-3/4  | 1/16  | 1.614±.013              | .070±.003 | 41.00±0.33              | 1.78±0.08 |
| -031            | 1-3/4             | 1-7/8  | 1/16  | 1.739±.015              | .070±.003 | 44.17±0.38              | 1.78±0.08 |
| -032            | 1-7/8             | 2      | 1/16  | 1.864±.015              | .070±.003 | 47.35±0.38              | 1.78±0.08 |
| -033            | 2                 | 2-1/8  | 1/16  | 1.989±.018              | .070±.003 | 50.52±0.46              | 1.78±0.08 |
| -034            | 2-1/8             | 2-1/4  | 1/16  | 2.114±.018              | .070±.003 | 53.70±0.46              | 1.78±0.08 |
| -035            | 2-1/4             | 2-3/8  | 1/16  | 2.239±.018              | .070±.003 | 56.87±0.46              | 1.78±0.08 |
| -036            | 2-3/8             | 2-1/2  | 1/16  | 2.364±.018              | .070±.003 | 60.05±0.46              | 1.78±0.08 |
| -037            | 2-1/2             | 2-5/8  | 1/16  | 2.489±.018              | .070±.003 | 63.22±0.46              | 1.78±0.08 |
| -038            | 2-5/8             | 2-3/4  | 1/16  | 2.614±.020              | .070±.003 | 66.40±0.51              | 1.78±0.08 |
| -039            | 2-3/4             | 2-7/8  | 1/16  | 2.739±.020              | .070±.003 | 69.57±0.51              | 1.78±0.08 |
| -040            | 2-7/8             | 3      | 1/16  | 2.864±.020              | .070±.003 | 72.75±0.51              | 1.78±0.08 |
| -041            | 3                 | 3-1/8  | 1/16  | 2.989±.024              | .070±.003 | 75.92±0.61              | 1.78±0.08 |
| -042            | 3-1/4             | 3-3/8  | 1/16  | 3.239±.024              | .070±.003 | 82.27±0.61              | 1.78±0.08 |
| -043            | 3-1/2             | 3-5/8  | 1/16  | 3.489±.024              | .070±.003 | 88.62±0.61              | 1.78±0.08 |
| -044            | 3-3/4             | 3-7/8  | 1/16  | 3.739±.027              | .070±.003 | 94.97±0.69              | 1.78±0.08 |
| -045            | 4                 | 4-1/8  | 1/16  | 3.989±.027              | .070±.003 | 101.32±0.69             | 1.78±0.08 |
| -046            | 4-1/4             | 4-3/8  | 1/16  | 4.239±.030              | .070±.003 | 107.67±0.76             | 1.78±0.08 |
| -047            | 4-1/2             | 4-5/8  | 1/16  | 4.489±.030              | .070±.003 | 114.02±0.76             | 1.78±0.08 |
| -048            | 4-3/4             | 4-7/8  | 1/16  | 4.739±.030              | .070±.003 | 120.37±0.76             | 1.78±0.08 |
| -049            | 5                 | 5-1/8  | 1/16  | 4.989±.037              | .070±.003 | 126.72±0.94             | 1.78±0.08 |
| -050            | 5-1/4             | 5-3/8  | 1/16  | 5.239±.037              | .070±.003 | 133.07±0.94             | 1.78±0.08 |
| -102            | 1/16              | 1/4    | 3/32  | .049±.005               | .103±.003 | 1.24±0.13               | 2.62±0.08 |
| -103            | 3/32              | 9/32   | 3/32  | .081±.005               | .103±.003 | 2.06±0.13               | 2.62±0.08 |
| -104            | 1/8               | 5/16   | 3/32  | .112±.005               | .103±.003 | 2.84±0.13               | 2.62±0.08 |
| -105            | 5/32              | 11/32  | 3/32  | .143±.005               | .103±.003 | 3.63±0.13               | 2.62±0.08 |
| -106            | 3/16              | 3/8    | 3/32  | .174±.005               | .103±.003 | 4.42±0.13               | 2.62±0.08 |
| -107            | 7/32              | 13/32  | 3/32  | .206±.005               | .103±.003 | 5.23±0.13               | 2.62±0.08 |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**



**O-Ring Sizes** - \*All inch sizes are in stock and ready to ship in NBR and VIT materials..

**I N C H**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).

| AS568A Dash No. | Nominal Inch Size |         |       | Actual O-Ring Size (in) |           | Actual O-Ring Size (mm) |           |
|-----------------|-------------------|---------|-------|-------------------------|-----------|-------------------------|-----------|
|                 | I.D.              | O.D.    | Width | I.D.                    | Width     | I.D.                    | Width     |
| -108            | 1/4               | 7/16    | 3/32  | .237±.005               | .103±.003 | 6.02±0.13               | 2.62±0.08 |
| -109            | 5/16              | 1/2     | 3/32  | .299±.005               | .103±.003 | 7.59±0.13               | 2.62±0.08 |
| -110            | 3/8               | 9/16    | 3/32  | .362±.005               | .103±.003 | 9.19±0.13               | 2.62±0.08 |
| -111            | 7/16              | 5/8     | 3/32  | .424±.005               | .103±.003 | 10.77±0.13              | 2.62±0.08 |
| -112            | 1/2               | 11/16   | 3/32  | .487±.005               | .103±.003 | 12.37±0.13              | 2.62±0.08 |
| -113            | 9/16              | 3/4     | 3/32  | .549±.007               | .103±.003 | 13.94±0.18              | 2.62±0.08 |
| -114            | 5/8               | 131/16  | 3/32  | .612±.009               | .103±.003 | 15.54±0.23              | 2.62±0.08 |
| -115            | 11/16             | 7/8     | 3/32  | .674±.009               | .103±.003 | 17.12±0.23              | 2.62±0.08 |
| -116            | 3/4               | 15/16   | 3/32  | .737±.009               | .103±.003 | 18.72±0.23              | 2.62±0.08 |
| -117            | 13/16             | 1       | 3/32  | .799±.010               | .103±.003 | 20.30±0.25              | 2.62±0.08 |
| -118            | 7/8               | 1-1/16  | 3/32  | .862±.010               | .103±.003 | 21.89±0.25              | 2.62±0.08 |
| -119            | 15/16             | 1-1/8   | 3/32  | .924±.010               | .103±.003 | 23.47±0.25              | 2.62±0.08 |
| -120            | 1                 | 1-3/16  | 3/32  | .987±.010               | .103±.003 | 25.07±0.25              | 2.62±0.08 |
| -121            | 1-1/16            | 1-1/4   | 3/32  | 1.049±.010              | .103±.003 | 26.64±0.25              | 2.62±0.08 |
| -122            | 1-1/8             | 1-5/16  | 3/32  | 1.112±.010              | .103±.003 | 28.24±0.25              | 2.62±0.08 |
| -123            | 1-3/16            | 1-3/8   | 3/32  | 1.174±.012              | .103±.003 | 29.82±0.30              | 2.62±0.08 |
| -124            | 1-1/4             | 1-7/16  | 3/32  | 1.237±.012              | .103±.003 | 31.42±0.30              | 2.62±0.08 |
| -125            | 1-5/16            | 1-1/2   | 3/32  | 1.299±.012              | .103±.003 | 32.99±0.30              | 2.62±0.08 |
| -126            | 1-3/8             | 1-9/16  | 3/32  | 1.362±.012              | .103±.003 | 34.59±0.30              | 2.62±0.08 |
| -127            | 1-7/16            | 1-5/8   | 3/32  | 1.424±.012              | .103±.003 | 36.17±0.30              | 2.62±0.08 |
| -128            | 1-1/12            | 1-11/16 | 3/32  | 1.487±.012              | .103±.003 | 37.77±0.30              | 2.62±0.08 |
| -129            | 1-9/16            | 1-3/4   | 3/32  | 1.549±.015              | .103±.003 | 39.34±0.38              | 2.62±0.08 |
| -130            | 1-5/8             | 1-13/16 | 3/32  | 1.612±.015              | .103±.003 | 40.94±0.38              | 2.62±0.08 |
| -131            | 1-11/16           | 1-7/8   | 3/32  | 1.674±.015              | .103±.003 | 42.52±0.38              | 2.62±0.08 |
| -132            | 1-3/4             | 1-15/16 | 3/32  | 1.737±.015              | .103±.003 | 44.12±0.38              | 2.62±0.08 |
| -133            | 1-13/16           | 2       | 3/32  | 1.799±.015              | .103±.003 | 45.69±0.38              | 2.62±0.08 |
| -134            | 1-7/8             | 2-1/16  | 3/32  | 1.862±.015              | .103±.003 | 47.30±0.38              | 2.62±0.08 |
| -135            | 1-15/16           | 2-1/8   | 3/32  | 1.925±.017              | .103±.003 | 48.90±0.43              | 2.62±0.08 |
| -136            | 2                 | 2-3/16  | 3/32  | 1.987±.017              | .103±.003 | 50.47±0.43              | 2.62±0.08 |
| -137            | 2-1/16            | 2-1/4   | 3/32  | 2.050±.017              | .103±.003 | 52.07±0.43              | 2.62±0.08 |
| -138            | 2-1/8             | 2-5/16  | 3/32  | 2.112±.017              | .103±.003 | 53.64±0.43              | 2.62±0.08 |
| -139            | 2-3/16            | 2-3/8   | 3/32  | 2.175±.017              | .103±.003 | 55.25±0.43              | 2.62±0.08 |
| -140            | 2-1/4             | 2-7/16  | 3/32  | 2.237±.017              | .103±.003 | 56.82±0.43              | 2.62±0.08 |
| -141            | 2-5/16            | 2-1/2   | 3/32  | 2.300±.020              | .103±.003 | 58.42±0.51              | 2.62±0.08 |
| -142            | 2-3/8             | 2-9/16  | 3/32  | 2.362±.020              | .103±.003 | 59.99±0.51              | 2.62±0.08 |
| -143            | 2-7/16            | 2-5/8   | 3/32  | 2.425±.020              | .103±.003 | 61.60±0.51              | 2.62±0.08 |

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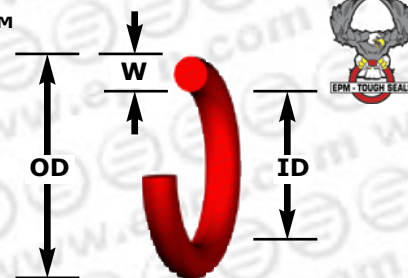
**O-Ring Sizes** - \*All inch sizes are in stock and ready to ship in NBR and VIT materials..

## INCH

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| AS568A Dash No. | Nominal Inch Size |         |       | Actual O-Ring Size (in) |           | Actual O-Ring Size (mm) |           |
|-----------------|-------------------|---------|-------|-------------------------|-----------|-------------------------|-----------|
|                 | I.D.              | O.D.    | Width | I.D.                    | Width     | I.D.                    | Width     |
| -144            | 2-1/2             | 2-11/16 | 3/32  | 2.487±.020              | .103±.003 | 63.17±0.51              | 2.62±0.08 |
| -145            | 2-9/16            | 2-3/4   | 3/32  | 2.550±.020              | .103±.003 | 64.77±0.51              | 2.62±0.08 |
| -146            | 2-5/8             | 2-13/16 | 3/32  | 2.612±.020              | .103±.003 | 66.34±0.51              | 2.62±0.08 |
| -147            | 2-11/16           | 2-7/8   | 3/32  | 2.675±.022              | .103±.003 | 67.95±0.56              | 2.62±0.08 |
| -148            | 2-3/4             | 2-15/16 | 3/32  | 2.737±.022              | .103±.003 | 69.52±0.56              | 2.62±0.08 |
| -149            | 2-13/16           | 3       | 3/32  | 2.800±.022              | .103±.003 | 71.12±0.56              | 2.62±0.08 |
| -150            | 2-7/8             | 3-1/16  | 3/32  | 2.862±.022              | .103±.003 | 72.69±0.56              | 2.62±0.08 |
| -151            | 3                 | 3-3/16  | 3/32  | 2.987±.024              | .103±.003 | 75.87±0.61              | 2.62±0.08 |
| -152            | 3-1/4             | 3-7/16  | 3/32  | 3.237±.024              | .103±.003 | 82.22±0.61              | 2.62±0.08 |
| -153            | 3-1/2             | 3-11/16 | 3/32  | 3.487±.024              | .103±.003 | 88.57±0.61              | 2.62±0.08 |
| -154            | 3-3/4             | 3-15/16 | 3/32  | 3.737±.028              | .103±.003 | 94.92±0.71              | 2.62±0.08 |
| -155            | 4                 | 4-3/16  | 3/32  | 3.987±.028              | .103±.003 | 101.27±0.71             | 2.62±0.08 |
| -156            | 4-1/4             | 4-7/16  | 3/32  | 4.237±.030              | .103±.003 | 107.62±0.76             | 2.62±0.08 |
| -157            | 4-1/2             | 4-11/16 | 3/32  | 4.487±.030              | .103±.003 | 113.97±0.76             | 2.62±0.08 |
| -158            | 4-3/4             | 4-15/16 | 3/32  | 4.737±.030              | .103±.003 | 120.32±0.76             | 2.62±0.08 |
| -159            | 5                 | 5-3/16  | 3/32  | 4.987±.035              | .103±.003 | 126.67±0.89             | 2.62±0.08 |
| -160            | 5-1/4             | 5-7/16  | 3/32  | 5.237±.035              | .103±.003 | 133.02±0.89             | 2.62±0.08 |
| -161            | 5-1/2             | 5-11/16 | 3/32  | 5.487±.035              | .103±.003 | 139.37±0.89             | 2.62±0.08 |
| -162            | 5-3/4             | 5-15/16 | 3/32  | 5.737±.035              | .103±.003 | 145.72±0.89             | 2.62±0.08 |
| -163            | 6                 | 6-3/16  | 3/32  | 5.987±.035              | .103±.003 | 152.07±0.89             | 2.62±0.08 |
| -164            | 6-1/4             | 6-7/16  | 3/32  | 6.237±.040              | .103±.003 | 158.42±1.02             | 2.62±0.08 |
| -165            | 6-1/2             | 6-11/16 | 3/32  | 6.487±.040              | .103±.003 | 164.77±1.02             | 2.62±0.08 |
| -166            | 6-3/4             | 6-15/16 | 3/32  | 6.737±.040              | .103±.003 | 171.12±1.02             | 2.62±0.08 |
| -167            | 7                 | 7-3/16  | 3/32  | 6.987±.040              | .103±.003 | 177.47±1.02             | 2.62±0.08 |
| -168            | 7-1/4             | 7-7/16  | 3/32  | 7.237±.045              | .103±.003 | 183.82±1.14             | 2.62±0.08 |
| -169            | 7-1/2             | 7-11/16 | 3/32  | 7.487±.045              | .103±.003 | 190.17±1.14             | 2.62±0.08 |
| -170            | 7-3/4             | 7-15/16 | 3/32  | 7.737±.045              | .103±.003 | 196.52±1.14             | 2.62±0.08 |
| -171            | 8                 | 8-3/16  | 3/32  | 7.987±.045              | .103±.003 | 202.87±1.14             | 2.62±0.08 |
| -172            | 8-1/4             | 8-7/16  | 3/32  | 8.237±.050              | .103±.003 | 209.22±1.27             | 2.62±0.08 |
| -173            | 8-1/2             | 8-11/16 | 3/32  | 8.487±.050              | .103±.003 | 215.57±1.27             | 2.62±0.08 |
| -174            | 8-3/4             | 8-15/16 | 3/32  | 8.737±.050              | .103±.003 | 221.92±1.27             | 2.62±0.08 |
| -175            | 9                 | 9-3/16  | 3/32  | 8.987±.050              | .103±.003 | 228.27±1.27             | 2.62±0.08 |
| -176            | 9-1/4             | 9-7/16  | 3/32  | 9.237±.055              | .103±.003 | 234.62±1.40             | 2.62±0.08 |
| -177            | 9-1/2             | 9-11/16 | 3/32  | 9.487±.055              | .103±.003 | 240.97±1.40             | 2.62±0.08 |
| -178            | 9-3/4             | 9-15/16 | 3/32  | 9.737±.055              | .103±.003 | 247.32±1.40             | 2.62±0.08 |
| -201            | 3/16              | 7-1/16  | 1/8   | .171±.005               | .139±.004 | 4.34±0.13               | 3.53±0.10 |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

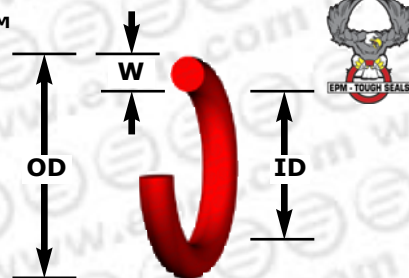
**O-Ring Sizes** - \*All inch sizes are in stock and ready to ship in NBR and VIT materials..

## INCH

**SIZING CHART** (continued)

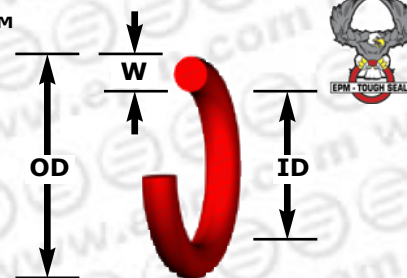


For [Groove Dimensions](#) see [pages 109-113](#).



| AS568A Dash No. | Nominal Inch Size |         |       | Actual O-Ring Size (in) |           | Actual O-Ring Size (mm) |           |
|-----------------|-------------------|---------|-------|-------------------------|-----------|-------------------------|-----------|
|                 | I.D.              | O.D.    | Width | I.D.                    | Width     | I.D.                    | Width     |
| -202            | 1/4               | 1/2     | 1/8   | .234±.005               | .139±.004 | 5.94±0.13               | 3.53±0.10 |
| -203            | 5/16              | 9/16    | 1/8   | .296±.005               | .139±.004 | 7.52±0.13               | 3.53±0.10 |
| -204            | 3//8              | 5/8     | 1/8   | .359±.005               | .139±.004 | 9.12±0.13               | 3.53±0.10 |
| -205            | 7/16              | 11/16   | 1/8   | .421±.005               | .139±.004 | 10.69±0.13              | 3.53±0.10 |
| -206            | 1/2               | 3/4     | 1/8   | .484±.005               | .139±.004 | 12.29±0.13              | 3.53±0.10 |
| -207            | 9/16              | 13/16   | 1/8   | .546±.007               | .139±.004 | 13.87±0.17              | 3.53±0.10 |
| -208            | 5/8               | 7/8     | 1/8   | .609±.009               | .139±.004 | 15.47±0.23              | 3.53±0.10 |
| -209            | 11/16             | 15/16   | 1/8   | .671±.009               | .139±.004 | 17.04±0.23              | 3.53±0.10 |
| -210            | 3/4               | 1       | 1/8   | .734±.010               | .139±.004 | 18.64±0.25              | 3.53±0.10 |
| -211            | 13/16             | 1-1/16  | 1/8   | .796±.010               | .139±.004 | 20.22±0.25              | 3.53±0.10 |
| -212            | 7/8               | 1-1/8   | 1/8   | .859±.010               | .139±.004 | 21.82±0.25              | 3.53±0.10 |
| -213            | 15/16             | 1-3/16  | 1/8   | .921±.010               | .139±.004 | 23.39±0.25              | 3.53±0.10 |
| -214            | 1                 | 1-1/4   | 1/8   | .984±.010               | .139±.004 | 25.00±0.25              | 3.53±0.10 |
| -215            | 1-1/16            | 1-5/16  | 1/8   | 1.046±.010              | .139±.004 | 26.57±0.25              | 3.53±0.10 |
| -216            | 1-1/8             | 1-3/8   | 1/8   | 1.109±.012              | .139±.004 | 28.17±0.30              | 3.53±0.10 |
| -217            | 1-3/16            | 1-7/16  | 1/8   | 1.171±.012              | .139±.004 | 29.74±0.30              | 3.53±0.10 |
| -218            | 1-1/4             | 1-1/2   | 1/8   | 1.234±.012              | .139±.004 | 31.34±0.30              | 3.53±0.10 |
| -219            | 1-5/16            | 1-9/16  | 1/8   | 1.296±.012              | .139±.004 | 32.92±0.30              | 3.53±0.10 |
| -220            | 1-3/8             | 1-5/8   | 1/8   | 1.359±.012              | .139±.004 | 34.52±0.30              | 3.53±0.10 |
| -221            | 1-7/16            | 1-11/16 | 1/8   | 1.421±.012              | .139±.004 | 36.09±0.30              | 3.53±0.10 |
| -222            | 1-1/2             | 1-3/4   | 1/8   | 1.484±.015              | .139±.004 | 37.69±0.38              | 3.53±0.10 |
| -223            | 1-5/8             | 1-7/8   | 1/8   | 1.609±.015              | .139±.004 | 40.87±0.38              | 3.53±0.10 |
| -224            | 1-3/4             | 2       | 1/8   | 1.734±.015              | .139±.004 | 44.04±0.38              | 3.53±0.10 |
| -225            | 1-7/8             | 2-1/8   | 1/8   | 1.859±.018              | .139±.004 | 47.22±0.46              | 3.53±0.10 |
| -226            | 2                 | 2-1/4   | 1/8   | 1.984±.018              | .139±.004 | 50.39±0.46              | 3.53±0.10 |
| -227            | 2-1/16            | 2-3/8   | 1/8   | 2.109±.018              | .139±.004 | 53.57±0.46              | 3.53±0.10 |
| -228            | 2-1/4             | 2-1/2   | 1/8   | 2.234±.020              | .139±.004 | 56.74±0.50              | 3.53±0.10 |
| -229            | 2-3/8             | 2-5/8   | 1/8   | 2.359±.020              | .139±.004 | 59.92±0.50              | 3.53±0.10 |
| -230            | 2-1/2             | 2-3/4   | 1/8   | 2.484±.020              | .139±.004 | 63.09±0.50              | 3.53±0.10 |
| -231            | 2-5/8             | 2-7/8   | 1/8   | 2.609±.020              | .139±.004 | 66.27±0.50              | 3.53±0.10 |
| -232            | 2-3/4             | 3       | 1/8   | 2.734±.024              | .139±.004 | 69.44±0.61              | 3.53±0.10 |
| -233            | 2-7/8             | 3-1/8   | 1/8   | 2.859±.024              | .139±.004 | 72.62±0.61              | 3.53±0.10 |
| -234            | 3                 | 3-1/4   | 1/8   | 2.984±.024              | .139±.004 | 75.79±0.61              | 3.53±0.10 |
| -235            | 3-1/8             | 3-3/8   | 1/8   | 3.109±.024              | .139±.004 | 78.97±0.61              | 3.53±0.10 |
| -236            | 3-1/4             | 3-1/2   | 1/8   | 3.234±.024              | .139±.004 | 82.14±0.61              | 3.53±0.10 |
| -237            | 3-3/8             | 3-5/8   | 1/8   | 3.359±.024              | .139±.004 | 85.32±0.61              | 3.53±0.10 |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**



**O-Ring Sizes** - \*All inch sizes are in stock and ready to ship in NBR and VIT materials..

**I N C H**

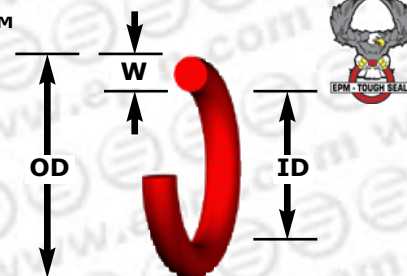
**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).

| AS568A Dash No. | Nominal Inch Size |       |       | Actual O-Ring Size (in) |           | Actual O-Ring Size (mm) |           |
|-----------------|-------------------|-------|-------|-------------------------|-----------|-------------------------|-----------|
|                 | I.D.              | O.D.  | Width | I.D.                    | Width     | I.D.                    | Width     |
| -238            | 3-1/2             | 3-3/4 | 1/8   | 3.484±.024              | .139±.004 | 88.49±0.61              | 3.53±0.10 |
| -239            | 3-5/8             | 3-7/8 | 1/8   | 3.609±.028              | .139±.004 | 91.67±0.71              | 3.53±0.10 |
| -240            | 3-3/4             | 4     | 1/8   | 3.734±.028              | .139±.004 | 94.84±0.71              | 3.53±0.10 |
| -241            | 3-7/8             | 4-1/8 | 1/8   | 3.859±.028              | .139±.004 | 98.02±0.71              | 3.53±0.10 |
| -242            | 4                 | 4-1/4 | 1/8   | 3.984±.028              | .139±.004 | 101.19±0.71             | 3.53±0.10 |
| -243            | 4-1/8             | 4-3/8 | 1/8   | 4.109±.028              | .139±.004 | 104.37±0.71             | 3.53±0.10 |
| -244            | 4-1/4             | 4-1/2 | 1/8   | 4.234±.030              | .139±.004 | 107.54±0.76             | 3.53±0.10 |
| -245            | 4-3/8             | 4-5/8 | 1/8   | 4.359±.030              | .139±.004 | 110.72±0.76             | 3.53±0.10 |
| -246            | 4-1/2             | 4-3/4 | 1/8   | 4.484±.030              | .139±.004 | 113.89±0.76             | 3.53±0.10 |
| -247            | 4-5/8             | 4-7/8 | 1/8   | 4.609±.030              | .139±.004 | 117.07±0.76             | 3.53±0.10 |
| -248            | 4-3/4             | 5     | 1/8   | 4.734±.030              | .139±.004 | 120.24±0.76             | 3.53±0.10 |
| -249            | 4-7/8             | 5-1/8 | 1/8   | 4.859±.035              | .139±.004 | 123.42±0.89             | 3.53±0.10 |
| -250            | 5                 | 5-1/4 | 1/8   | 4.984±.035              | .139±.004 | 126.59±0.89             | 3.53±0.10 |
| -251            | 5-1/8             | 5-3/8 | 1/8   | 5.109±.035              | .139±.004 | 129.77±0.89             | 3.53±0.10 |
| -252            | 5-1/4             | 5-1/2 | 1/8   | 5.234±.035              | .139±.004 | 132.94±0.89             | 3.53±0.10 |
| -253            | 5-3/8             | 5-5/8 | 1/8   | 5.359±.035              | .139±.004 | 136.12±0.89             | 3.53±0.10 |
| -254            | 5-1/2             | 5-3/4 | 1/8   | 5.484±.035              | .139±.004 | 139.29±0.89             | 3.53±0.10 |
| -255            | 5-5/8             | 5-7/8 | 1/8   | 5.609±.035              | .139±.004 | 142.47±0.89             | 3.53±0.10 |
| -256            | 5-3/4             | 6     | 1/8   | 5.734±.035              | .139±.004 | 145.65±0.89             | 3.53±0.10 |
| -257            | 5-7/8             | 6-1/8 | 1/8   | 5.859±.035              | .139±.004 | 148.82±0.89             | 3.53±0.10 |
| -258            | 6                 | 6-1/4 | 1/8   | 5.984±.035              | .139±.004 | 151.99±0.89             | 3.53±0.10 |
| -259            | 6-1/4             | 6-1/2 | 1/8   | 6.234±.040              | .139±.004 | 158.34±1.02             | 3.53±0.10 |
| -260            | 6-1/2             | 6-3/4 | 1/8   | 6.484±.040              | .139±.004 | 164.69±1.02             | 3.53±0.10 |
| -261            | 6-3/4             | 7     | 1/8   | 6.734±.040              | .139±.004 | 171.04±1.02             | 3.53±0.10 |
| -262            | 7                 | 7-1/4 | 1/8   | 6.984±.040              | .139±.004 | 177.39±1.02             | 3.53±0.10 |
| -263            | 7-1/4             | 7-1/2 | 1/8   | 7.234±.045              | .139±.004 | 183.74±1.14             | 3.53±0.10 |
| -264            | 7-1/2             | 7-3/4 | 1/8   | 7.484±.045              | .139±.004 | 190.09±1.14             | 3.53±0.10 |
| -265            | 7-3/4             | 8     | 1/8   | 7.734±.045              | .139±.004 | 196.44±1.14             | 3.53±0.10 |
| -266            | 8                 | 8-1/4 | 1/8   | 7.984±.045              | .139±.004 | 202.79±1.14             | 3.53±0.10 |
| -267            | 8-1/4             | 8-1/2 | 1/8   | 8.234±.050              | .139±.004 | 209.14±1.27             | 3.53±0.10 |
| -268            | 8-1/2             | 8-3/4 | 1/8   | 8.484±.050              | .139±.004 | 215.49±1.27             | 3.53±0.10 |
| -269            | 8-3/4             | 9     | 1/8   | 8.734±.050              | .139±.004 | 221.84±1.27             | 3.53±0.10 |
| -270            | 9                 | 9-1/4 | 1/8   | 8.984±.050              | .139±.004 | 228.19±1.27             | 3.53±0.10 |
| -271            | 9-1/4             | 9-1/2 | 1/8   | 9.234±.055              | .139±.004 | 234.54±1.40             | 3.53±0.10 |
| -272            | 9-1/2             | 9-3/4 | 1/8   | 9.484±.055              | .139±.004 | 240.89±1.40             | 3.53±0.10 |
| -273            | 9-3/4             | 10    | 1/8   | 9.734±.055              | .139±.004 | 247.24±1.40             | 3.53±0.10 |

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**O-Ring Sizes** - \*All inch sizes are in stock and ready to ship in NBR and VIT materials..

**I N C H**

**SIZING CHART** (continued)

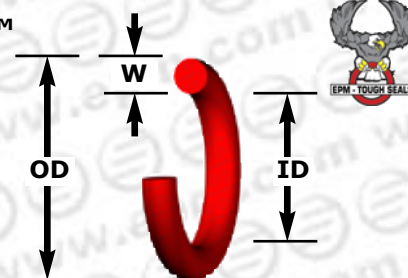


For [Groove Dimensions](#) see [pages 109-113](#).

| AS568A Dash No. | Nominal Inch Size |         |       | Actual O-Ring Size (in) |           | Actual O-Ring Size (mm) |           |
|-----------------|-------------------|---------|-------|-------------------------|-----------|-------------------------|-----------|
|                 | I.D.              | O.D.    | Width | I.D.                    | Width     | I.D.                    | Width     |
| -274            | 10                | 10-1/4  | 1/8   | 9.984±.055              | .139±.004 | 253.59±1.40             | 3.53±0.10 |
| -275            | 10-1/2            | 10-3/4  | 1/8   | 10.484±.065             | .139±.004 | 266.29±1.40             | 3.53±0.10 |
| -276            | 11                | 11-1/4  | 1/8   | 10.984±.065             | .139±.004 | 278.99±1.65             | 3.53±0.10 |
| -277            | 11-1/2            | 11-3/4  | 1/8   | 11.484±.065             | .139±.004 | 291.69±1.65             | 3.53±0.10 |
| -278            | 12                | 12-1/4  | 1/8   | 11.984±.065             | .139±.004 | 304.39±1.65             | 3.53±0.10 |
| -279            | 13                | 13-1/4  | 1/8   | 12.984±.065             | .139±.004 | 329.79±1.65             | 3.53±0.10 |
| -280            | 14                | 14-1/4  | 1/8   | 13.984±.065             | .139±.004 | 355.19±1.65             | 3.53±0.10 |
| -281            | 15                | 15-1/4  | 1/8   | 14.984±.065             | .139±.004 | 380.59±1.65             | 3.53±0.10 |
| -282            | 16                | 16-1/4  | 1/8   | 15.955±.075             | .139±.004 | 405.26±1.91             | 3.53±0.10 |
| -283            | 17                | 17-1/4  | 1/8   | 16.955±.080             | .139±.004 | 430.66±2.03             | 3.53±0.10 |
| -284            | 18                | 18-1/4  | 1/8   | 17.955±.085             | .139±.004 | 456.06±2.16             | 3.53±0.10 |
| -309            | 7/16              | 13/16   | 3/16  | .412±.005               | .210±.005 | 10.46±0.13              | 5.33±0.13 |
| -310            | 1/2               | 7/8     | 3/16  | .475±.005               | .210±.005 | 12.07±0.13              | 5.33±0.13 |
| -311            | 9/16              | 15/16   | 3/16  | .537±.007               | .210±.005 | 13.64±0.18              | 5.33±0.13 |
| -312            | 5/8               | 1       | 3/16  | .600±.009               | .210±.005 | 15.24±0.23              | 5.33±0.13 |
| -313            | 11/16             | 1-1/16  | 3/16  | .662±.009               | .210±.005 | 16.81±0.23              | 5.33±0.13 |
| -314            | 3/4               | 1-1/8   | 3/16  | .725±.010               | .210±.005 | 18.42±0.25              | 5.33±0.13 |
| -315            | 13/16             | 1-3/16  | 3/16  | .787±.010               | .210±.005 | 19.99±0.25              | 5.33±0.13 |
| -316            | 7/8               | 1-1/4   | 3/16  | .850±.010               | .210±.005 | 21.59±0.25              | 5.33±0.13 |
| -317            | 15/16             | 1-5/16  | 3/16  | .912±.010               | .210±.005 | 23.16±0.25              | 5.33±0.13 |
| -318            | 1                 | 1-3/8   | 3/16  | .975±.010               | .210±.005 | 24.77±0.25              | 5.33±0.13 |
| -319            | 1-1/16            | 1-7/16  | 3/16  | 1.037±.010              | .210±.005 | 26.34±0.25              | 5.33±0.13 |
| -320            | 1-1/8             | 1-1/2   | 3/16  | 1.100±.012              | .210±.005 | 27.94±0.30              | 5.33±0.13 |
| -321            | 1-3/16            | 1-9/16  | 3/16  | 1.162±.012              | .210±.005 | 29.51±0.30              | 5.33±0.13 |
| -322            | 1-1/4             | 1-5/8   | 3/16  | 1.225±.012              | .210±.005 | 31.12±0.30              | 5.33±0.13 |
| -323            | 1-5/16            | 1-11/16 | 3/16  | 1.287±.012              | .210±.005 | 32.69±0.30              | 5.33±0.13 |
| -324            | 1-3/8             | 1-3/4   | 3/16  | 1.350±.012              | .210±.005 | 34.29±0.30              | 5.33±0.13 |
| -325            | 1-1/2             | 1-7/8   | 3/16  | 1.475±.015              | .210±.005 | 37.47±0.38              | 5.33±0.13 |
| -326            | 1-5/8             | 2       | 3/16  | 1.600±.015              | .210±.005 | 40.64±0.38              | 5.33±0.13 |
| -327            | 1-3/4             | 2-1/8   | 3/16  | 1.725±.015              | .210±.005 | 43.82±0.38              | 5.33±0.13 |
| -328            | 1-7/8             | 2-1/4   | 3/16  | 1.850±.015              | .210±.005 | 46.99±0.38              | 5.33±0.13 |
| -329            | 2                 | 2-3/8   | 3/16  | 1.975±.018              | .210±.005 | 50.17±0.46              | 5.33±0.13 |
| -330            | 2-1/8             | 2-1/2   | 3/16  | 2.100±.018              | .210±.005 | 53.34±0.46              | 5.33±0.13 |
| -331            | 2-1/4             | 2-5/8   | 3/16  | 2.225±.018              | .210±.005 | 56.52±0.46              | 5.33±0.13 |
| -332            | 2-3/8             | 2-3/4   | 3/16  | 2.350±.018              | .210±.005 | 59.69±0.46              | 5.33±0.13 |
| -333            | 2-1/2             | 2-7/8   | 3/16  | 2.475±.020              | .210±.005 | 62.87±0.51              | 5.33±0.13 |



**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**



**O-Ring Sizes** - \*All inch sizes are in stock and ready to ship in NBR and VIT materials..

**I N C H**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).

| AS568A Dash No. | Nominal Inch Size |       |       | Actual O-Ring Size (in) |           | Actual O-Ring Size (mm) |           |
|-----------------|-------------------|-------|-------|-------------------------|-----------|-------------------------|-----------|
|                 | I.D.              | O.D.  | Width | I.D.                    | Width     | I.D.                    | Width     |
| -334            | 2-5/8             | 3     | 3/16  | 2.600±.020              | .210±.005 | 66.04±0.51              | 5.33±0.13 |
| -335            | 2-3/4             | 3-1/8 | 3/16  | 2.725±.020              | .210±.005 | 69.22±0.51              | 5.33±0.13 |
| -336            | 2-7/8             | 3-1/4 | 3/16  | 2.850±.020              | .210±.005 | 72.39±0.51              | 5.33±0.13 |
| -337            | 3                 | 3-3/8 | 3/16  | 2.975±.024              | .210±.005 | 75.57±0.61              | 5.33±0.13 |
| -338            | 3-1/8             | 3-1/2 | 3/16  | 3.100±.024              | .210±.005 | 78.74±0.61              | 5.33±0.13 |
| -339            | 3-1/4             | 3-5/8 | 3/16  | 3.225±.024              | .210±.005 | 91.92±0.61              | 5.33±0.13 |
| -340            | 3-3/8             | 3-3/4 | 3/16  | 3.350±.024              | .210±.005 | 85.09±0.61              | 5.33±0.13 |
| -341            | 3-1/2             | 3-7/8 | 3/16  | 3.475±.024              | .210±.005 | 88.27±0.61              | 5.33±0.13 |
| -342            | 3-5/8             | 4     | 3/16  | 3.600±.028              | .210±.005 | 91.44±0.71              | 5.33±0.13 |
| -343            | 3-3/4             | 4-1/8 | 3/16  | 3.725±.028              | .210±.005 | 94.62±0.71              | 5.33±0.13 |
| -344            | 3-7/8             | 4-1/4 | 3/16  | 3.850±.028              | .210±.005 | 97.79±0.71              | 5.33±0.13 |
| -345            | 4                 | 4-3/8 | 3/16  | 3.975±.028              | .210±.005 | 100.97±0.71             | 5.33±0.13 |
| -346            | 4-1/8             | 4-1/2 | 3/16  | 4.100±.028              | .210±.005 | 104.14±0.71             | 5.33±0.13 |
| -347            | 4-1/4             | 4-5/8 | 3/16  | 4.225±.030              | .210±.005 | 107.32±0.76             | 5.33±0.13 |
| -348            | 4-3/8             | 4-3/4 | 3/16  | 4.350±.030              | .210±.005 | 110.49±0.76             | 5.33±0.13 |
| -349            | 4-1/2             | 4-7/8 | 3/16  | 4.475±.030              | .210±.005 | 113.67±0.76             | 5.33±0.13 |
| -350            | 4-5/8             | 5     | 3/16  | 4.600±.030              | .210±.005 | 116.84±0.76             | 5.33±0.13 |
| -351            | 4-3/4             | 5-1/8 | 3/16  | 4.725±.030              | .210±.005 | 120.02±0.76             | 5.33±0.13 |
| -352            | 4-7/8             | 5-1/4 | 3/16  | 4.850±.030              | .210±.005 | 123.19±0.76             | 5.33±0.13 |
| -353            | 5                 | 5-3/8 | 3/16  | 4.975±.037              | .210±.005 | 126.37±0.94             | 5.33±0.13 |
| -354            | 5-1/8             | 5-1/2 | 3/16  | 5.100±.037              | .210±.005 | 129.54±0.94             | 5.33±0.13 |
| -355            | 5-1/4             | 5-5/8 | 3/16  | 5.225±.037              | .210±.005 | 132.72±0.94             | 5.33±0.13 |
| -356            | 5-3/8             | 5-3/4 | 3/16  | 5.350±.037              | .210±.005 | 135.89±0.94             | 5.33±0.13 |
| -357            | 5-1/2             | 5-7/8 | 3/16  | 5.475±.037              | .210±.005 | 139.07±0.94             | 5.33±0.13 |
| -358            | 5-5/8             | 6     | 3/16  | 5.600±.037              | .210±.005 | 142.24±0.94             | 5.33±0.13 |
| -359            | 5-3/4             | 6-1/8 | 3/16  | 5.725±.037              | .210±.005 | 145.42±0.94             | 5.33±0.13 |
| -360            | 5-7/8             | 6-1/4 | 3/16  | 5.850±.037              | .210±.005 | 148.59±0.94             | 5.33±0.13 |
| -361            | 6                 | 6-3/8 | 3/16  | 5.975±.037              | .210±.005 | 151.77±0.94             | 5.33±0.13 |
| -362            | 6-1/4             | 6-5/8 | 3/16  | 6.225±.040              | .210±.005 | 158.12±1.02             | 5.33±0.13 |
| -363            | 6-1/2             | 6-7/8 | 3/16  | 6.475±.040              | .210±.005 | 164.47±1.02             | 5.33±0.13 |
| -364            | 6-3/4             | 7-1/8 | 3/16  | 6.725±.040              | .210±.005 | 170.82±1.02             | 5.33±0.13 |
| -365            | 7                 | 7-3/8 | 3/16  | 6.975±.040              | .210±.005 | 177.17±1.02             | 5.33±0.13 |
| -366            | 7-1/4             | 7-5/8 | 3/16  | 7.225±.045              | .210±.005 | 183.52±1.14             | 5.33±0.13 |
| -367            | 7-1/2             | 7-7/8 | 3/16  | 7.475±.045              | .210±.005 | 189.87±1.14             | 5.33±0.13 |
| -368            | 7-3/4             | 8-1/8 | 3/16  | 7.725±.045              | .210±.005 | 196.22±1.14             | 5.33±0.13 |
| -369            | 8                 | 8-3/8 | 3/16  | 7.975±.045              | .210±.005 | 202.57±1.14             | 5.33±0.13 |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

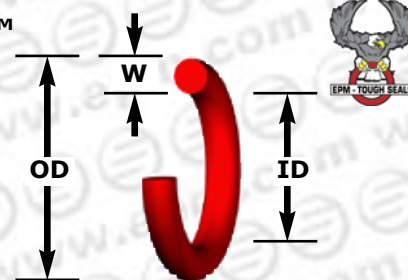
**O-Ring Sizes** - \*All inch sizes are in stock and ready to ship in NBR and VIT materials..

## INCH

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| AS568A Dash No. | Nominal Inch Size |        |       | Actual O-Ring Size (in) |           | Actual O-Ring Size (mm) |           |
|-----------------|-------------------|--------|-------|-------------------------|-----------|-------------------------|-----------|
|                 | I.D.              | O.D.   | Width | I.D.                    | Width     | I.D.                    | Width     |
| -370            | 8-1/4             | 8-5/8  | 3/16  | 8.225±.050              | .210±.005 | 208.92±1.27             | 5.33±0.13 |
| -371            | 8-1/2             | 8-7/8  | 3/16  | 8.475±.050              | .210±.005 | 215.27±1.27             | 5.33±0.13 |
| -372            | 8-3/4             | 9-1/8  | 3/16  | 8.725±.050              | .210±.005 | 221.62±1.27             | 5.33±0.13 |
| -373            | 9                 | 9-3/8  | 3/16  | 8.975±.050              | .210±.005 | 227.97±1.27             | 5.33±0.13 |
| -374            | 9-1/4             | 9-5/8  | 3/16  | 9.225±.055              | .210±.005 | 234.32±1.40             | 5.33±0.13 |
| -375            | 9-1/2             | 9-7/8  | 3/16  | 9.475±.055              | .210±.005 | 240.67±1.40             | 5.33±0.13 |
| -376            | 9-3/4             | 10-1/8 | 3/16  | 9.725±.055              | .210±.005 | 247.02±1.40             | 5.33±0.13 |
| -377            | 10                | 10-3/8 | 3/16  | 9.975±.055              | .210±.005 | 253.37±1.40             | 5.33±0.13 |
| -378            | 10-1/2            | 10-7/8 | 3/16  | 10.475±.060             | .210±.005 | 266.07±1.52             | 5.33±0.13 |
| -379            | 11                | 11-3/8 | 3/16  | 10.975±.060             | .210±.005 | 278.77±1.52             | 5.33±0.13 |
| -380            | 11-1/2            | 11-7/8 | 3/16  | 11.475±.065             | .210±.005 | 291.47±1.65             | 5.33±0.13 |
| -381            | 12                | 12-3/8 | 3/16  | 11.975±.065             | .210±.005 | 304.17±1.65             | 5.33±0.13 |
| -382            | 13                | 13-3/8 | 3/16  | 12.975±.065             | .210±.005 | 329.57±1.65             | 5.33±0.13 |
| -383            | 14                | 14-3/8 | 3/16  | 13.975±.070             | .210±.005 | 354.97±1.78             | 5.33±0.13 |
| -384            | 15                | 15-3/8 | 3/16  | 14.975±.070             | .210±.005 | 380.37±1.78             | 5.33±0.13 |
| -385            | 16                | 16-3/8 | 3/16  | 15.955±.075             | .210±.005 | 405.26±1.91             | 5.33±0.13 |
| -386            | 17                | 17-3/8 | 3/16  | 16.955±.080             | .210±.005 | 430.66±2.03             | 5.33±0.13 |
| -387            | 18                | 18-3/8 | 3/16  | 17.955±.085             | .210±.005 | 456.06±2.16             | 5.33±0.13 |
| -388            | 19                | 19-3/8 | 3/16  | 18.955±.090             | .210±.005 | 481.41±2.29             | 5.33±0.13 |
| -389            | 20                | 20-3/8 | 3/16  | 19.955±.095             | .210±.005 | 506.81±2.41             | 5.33±0.13 |
| -390            | 21                | 21-3/8 | 3/16  | 20.955±.095             | .210±.005 | 532.21±2.41             | 5.33±0.13 |
| -391            | 22                | 22-3/8 | 3/16  | 21.955±.100             | .210±.005 | 557.61±2.54             | 5.33±0.13 |
| -392            | 23                | 23-3/8 | 3/16  | 22.940±.105             | .210±.005 | 582.68±2.67             | 5.33±0.13 |
| -393            | 24                | 24-3/8 | 3/16  | 23.940±.110             | .210±.005 | 608.08±2.79             | 5.33±0.13 |
| -394            | 25                | 25-3/8 | 3/16  | 24.940±.115             | .210±.005 | 633.48±2.92             | 5.33±0.13 |
| -395            | 26                | 26-3/8 | 3/16  | 25.940±.120             | .210±.005 | 658.88±3.05             | 5.33±0.13 |
| -425            | 4-1/2             | 5      | 1/4   | 4.475±.033              | .275±.006 | 113.67±0.84             | 6.99±0.15 |
| -426            | 4-5/8             | 5-1/8  | 1/4   | 4.600±.033              | .275±.006 | 116.84±0.84             | 6.99±0.15 |
| -427            | 4-3/4             | 5-1/4  | 1/4   | 4.725±.033              | .275±.006 | 120.02±0.84             | 6.99±0.15 |
| -428            | 4-7/8             | 5-3/8  | 1/4   | 4.850±.033              | .275±.006 | 123.19±0.84             | 6.99±0.15 |
| -429            | 5                 | 5-1/2  | 1/4   | 4.975±.037              | .275±.006 | 126.37±0.94             | 6.99±0.15 |
| -430            | 5-1/8             | 5-5/8  | 1/4   | 5.100±.037              | .275±.006 | 129.54±0.94             | 6.99±0.15 |
| -431            | 5-1/4             | 5-3/8  | 1/4   | 5.225±.037              | .275±.006 | 132.72±0.94             | 6.99±0.15 |
| -432            | 5-3/8             | 5-7/8  | 1/4   | 5.350±.037              | .275±.006 | 135.89±0.94             | 6.99±0.15 |
| -433            | 5-1/2             | 6      | 1/4   | 5.475±.037              | .275±.006 | 139.07±0.94             | 6.99±0.15 |
| -434            | 5-5/8             | 6-1/8  | 1/4   | 5.600±.037              | .275±.006 | 142.24±0.94             | 6.99±0.15 |

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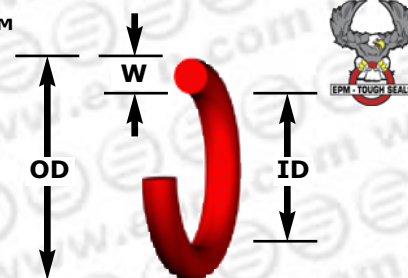
**O-Ring Sizes** - \*All inch sizes are in stock and ready to ship in NBR and VIT materials..

## INCH

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| AS568A Dash No. | Nominal Inch Size |        |       | Actual O-Ring Size (in) |           | Actual O-Ring Size (mm) |           |
|-----------------|-------------------|--------|-------|-------------------------|-----------|-------------------------|-----------|
|                 | I.D.              | O.D.   | Width | I.D.                    | Width     | I.D.                    | Width     |
| -435            | 5-3/4             | 6-1/4  | 1/4   | 5.725±.037              | .275±.006 | 145.42±0.94             | 6.99±0.15 |
| -436            | 5-7/8             | 6-3/8  | 1/4   | 5.850±.037              | .275±.006 | 148.59±0.94             | 6.99±0.15 |
| -437            | 6                 | 6-1/2  | 1/4   | 5.975±.037              | .275±.006 | 151.77±0.94             | 6.99±0.15 |
| -438            | 6-1/4             | 6-3/4  | 1/4   | 6.225±.040              | .275±.006 | 158.12±1.02             | 6.99±0.15 |
| -439            | 6-1/2             | 7      | 1/4   | 6.475±.040              | .275±.006 | 164.47±1.02             | 6.99±0.15 |
| -440            | 6-3/4             | 7-1/4  | 1/4   | 6.725±.040              | .275±.006 | 170.82±1.02             | 6.99±0.15 |
| -441            | 7                 | 7-1/2  | 1/4   | 6.975±.040              | .275±.006 | 177.17±1.02             | 6.99±0.15 |
| -442            | 7-1/4             | 7-3/4  | 1/4   | 7.225±.045              | .275±.006 | 183.52±1.14             | 6.99±0.15 |
| -443            | 7-1/2             | 8      | 1/4   | 7.475±.045              | .275±.006 | 189.87±1.14             | 6.99±0.15 |
| -444            | 7-3/4             | 8-1/4  | 1/4   | 7.725±.045              | .275±.006 | 196.22±1.14             | 6.99±0.15 |
| -445            | 8                 | 8-1/2  | 1/4   | 7.975±.045              | .275±.006 | 202.57±1.14             | 6.99±0.15 |
| -446            | 8-1/2             | 9      | 1/4   | 8.475±.055              | .275±.006 | 215.27±1.40             | 6.99±0.15 |
| -447            | 9                 | 9-1/2  | 1/4   | 8.975±.055              | .275±.006 | 227.97±1.40             | 6.99±0.15 |
| -448            | 9-1/2             | 10     | 1/4   | 9.475±.055              | .275±.006 | 240.67±1.40             | 6.99±0.15 |
| -449            | 10                | 10-1/2 | 1/4   | 9.975±.055              | .275±.006 | 253.37±1.40             | 6.99±0.15 |
| -450            | 10-1/2            | 11     | 1/4   | 10.475±.060             | .275±.006 | 266.07±1.52             | 6.99±0.15 |
| -451            | 11                | 11-1/2 | 1/4   | 10.975±.060             | .275±.006 | 278.77±1.52             | 6.99±0.15 |
| -452            | 11-1/2            | 12     | 1/4   | 11.475±.060             | .275±.006 | 291.47±1.52             | 6.99±0.15 |
| -453            | 12                | 12-1/2 | 1/4   | 11.975±.060             | .275±.006 | 304.17±1.52             | 6.99±0.15 |
| -454            | 12-1/2            | 13     | 1/4   | 12.475±.060             | .275±.006 | 316.87±1.52             | 6.99±0.15 |
| -455            | 13                | 13-1/2 | 1/4   | 12.975±.060             | .275±.006 | 329.57±1.52             | 6.99±0.15 |
| -456            | 13-1/2            | 14     | 1/4   | 13.457±.070             | .275±.006 | 342.27±1.78             | 6.99±0.15 |
| -457            | 14                | 14-1/2 | 1/4   | 13.975±.070             | .275±.006 | 354.97±1.78             | 6.99±0.15 |
| -458            | 14-1/2            | 15     | 1/4   | 14.475±.070             | .275±.006 | 367.67±1.78             | 6.99±0.15 |
| -459            | 15                | 15-1/2 | 1/4   | 14.975±.070             | .275±.006 | 380.37±1.78             | 6.99±0.15 |
| -460            | 15-1/2            | 16     | 1/4   | 15.475±.070             | .275±.006 | 393.07±1.78             | 6.99±0.15 |
| -461            | 16                | 16-1/2 | 1/4   | 15.955±.075             | .275±.006 | 405.26±1.91             | 6.99±0.15 |
| -462            | 16-1/2            | 17     | 1/4   | 16.455±.075             | .275±.006 | 417.96±1.91             | 6.99±0.15 |
| -463            | 17                | 17-1/2 | 1/4   | 16.955±.080             | .275±.006 | 430.66±2.03             | 6.99±0.15 |
| -464            | 17-1/2            | 18     | 1/4   | 17.455±.085             | .275±.006 | 443.36±2.16             | 6.99±0.15 |
| -465            | 18                | 18-1/2 | 1/4   | 17.955±.085             | .275±.006 | 456.06±2.16             | 6.99±0.15 |
| -466            | 18-1/2            | 19     | 1/4   | 18.455±.085             | .275±.006 | 468.76±2.16             | 6.99±0.15 |
| -467            | 19                | 19-1/2 | 1/4   | 18.955±.090             | .275±.006 | 481.46±2.29             | 6.99±0.15 |
| -468            | 19-1/2            | 20     | 1/4   | 19.455±.090             | .275±.006 | 494.16±2.29             | 6.99±0.15 |
| -469            | 20                | 20-1/2 | 1/4   | 19.955±.095             | .275±.006 | 506.86±2.41             | 6.99±0.15 |
| -470            | 21                | 21-1/2 | 1/4   | 20.955±.095             | .275±.006 | 532.26±2.41             | 6.99±0.15 |

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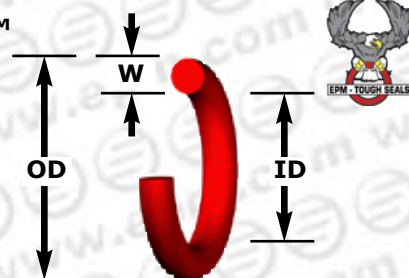
**O-Ring Sizes** - \*All inch sizes are in stock and ready to ship in NBR and VIT materials..

## INCH

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| AS568A Dash No. | Nominal Inch Size |        |       | Actual O-Ring Size (in) |           | Actual O-Ring Size (mm) |           |
|-----------------|-------------------|--------|-------|-------------------------|-----------|-------------------------|-----------|
|                 | I.D.              | O.D.   | Width | I.D.                    | Width     | I.D.                    | Width     |
| -471            | 22                | 22-1/2 | 1/4   | 21.955±.100             | .275±.006 | 557.66±2.54             | 6.99±0.15 |
| -472            | 23                | 23-1/2 | 1/4   | 22.940±.105             | .275±.006 | 582.68±2.67             | 6.99±0.15 |
| -473            | 24                | 24-1/2 | 1/4   | 23.940±.110             | .275±.006 | 608.08±2.79             | 6.99±0.15 |
| -474            | 25                | 25-1/2 | 1/4   | 24.940±.115             | .275±.006 | 633.48±2.92             | 6.99±0.15 |
| -475            | 26                | 26-1/2 | 1/4   | 25.940±.120             | .275±.006 | 658.88±3.05             | 6.99±0.15 |
| -901            | -                 | 3/32   | -     | .185±.005               | .056±.003 | 4.70±0.13               | 1.42±0.08 |
| -902            | -                 | 1/8    | -     | .239±.005               | .064±.003 | 6.07±0.13               | 1.63±0.08 |
| -903            | -                 | 3/16   | -     | .301±.005               | .064±.003 | 7.65±0.13               | 1.63±0.08 |
| -904            | -                 | 1/4    | -     | .351±.005               | .072±.003 | 8.92±0.13               | 1.83±0.08 |
| -905            | -                 | 5/16   | -     | .414±.005               | .072±.003 | 10.52±0.13              | 1.83±0.08 |
| -906            | -                 | 3/8    | -     | .468±.005               | .078±.003 | 11.89±0.13              | 1.98±0.08 |
| -907            | -                 | 7/16   | -     | .530±.007               | .082±.003 | 13.46±0.18              | 2.08±0.08 |
| -908            | -                 | 1/2    | -     | .644±.009               | .087±.003 | 16.36±0.23              | 2.21±0.08 |
| -909            | -                 | 9/16   | -     | .706±.009               | .097±.003 | 17.93±0.23              | 2.46±0.08 |
| -910            | -                 | 5/8    | -     | .755±.009               | .097±.003 | 19.18±0.23              | 2.46±0.08 |
| -911            | -                 | 11/16  | -     | .863±.009               | .116±.004 | 21.92±0.23              | 2.95±0.10 |
| -912            | -                 | 3/4    | -     | .924±.009               | .116±.004 | 23.47±0.23              | 2.95±0.10 |
| -913            | -                 | 13/16  | -     | .986±.010               | .116±.004 | 25.04±0.26              | 2.95±0.10 |
| -914            | -                 | 7/8    | -     | 1.047±.010              | .116±.004 | 26.59±0.26              | 2.95±0.10 |
| -916            | -                 | 1      | -     | 1.171±.010              | .116±.004 | 29.74±0.26              | 2.95±0.10 |
| -918            | -                 | 1-1/8  | -     | 1.355±.012              | .116±.004 | 34.42±0.30              | 2.95±0.10 |
| -920            | -                 | 1-1/4  | -     | 1.475±.014              | .116±.004 | 37.47±0.36              | 3.00±0.10 |
| -924            | -                 | 1-1/2  | -     | 1.720±.014              | .116±.004 | 43.69±0.36              | 3.00±0.10 |
| -928            | -                 | 1-3/4  | -     | 2.090±.018              | .116±.004 | 53.09±0.46              | 3.00±0.10 |
| -932            | -                 | 2      | -     | 2.337±.018              | .116±.004 | 59.36±0.46              | 3.00±0.10 |

AN6227 is an Air Force-Navy Aeronautical Standard that covers 88 sizes of AS568. MS28775 is the basic standard on which AS568 was developed. M25988, M83248, MS9020, MS9355, and MS29512 cover 31 O-Rings of slightly larger diameter cross sections to be used for sealing straight-thread tube fittings. These O-Rings are usually referred to as "3 dash 9" O-rings and are equivalent to dash numbers 901 through 932 of AS568. They are used in gland designs specified by military standards MS16142, MS33649, and MS33656 for tube fittings.

**Special sizes and custom made O-Rings are available in any material. Contact your EPM Customer Helper for details.**

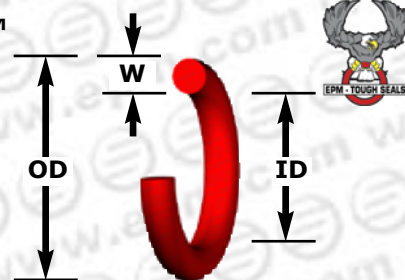
**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC SIZING CHART**



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| 1.00                    | 1.15         | -          |
| 1.00                    | 1.25         | -          |
| <b>1.00</b>             | <b>1.50</b>  | -          |
| 1.00                    | 1.80         | -          |
| <b>1.00</b>             | <b>2.00</b>  | -          |
| <b>1.00</b>             | <b>2.50</b>  | -          |
| 1.00                    | 2.70         | -          |
| <b>1.00</b>             | <b>3.00</b>  | -          |
| 1.00                    | 3.30         | -          |
| <b>1.00</b>             | <b>3.50</b>  | -          |
| <b>1.00</b>             | <b>4.00</b>  | -          |
| <b>1.00</b>             | <b>4.50</b>  | -          |
| <b>1.00</b>             | <b>5.00</b>  | -          |
| <b>1.00</b>             | <b>5.50</b>  | -          |
| <b>1.00</b>             | <b>6.00</b>  | -          |
| <b>1.00</b>             | <b>6.50</b>  | -          |
| <b>1.00</b>             | <b>7.00</b>  | -          |
| 1.00                    | 7.20         | -          |
| <b>1.00</b>             | <b>7.50</b>  | -          |
| <b>1.00</b>             | <b>8.00</b>  | -          |
| <b>1.00</b>             | <b>8.50</b>  | -          |
| <b>1.00</b>             | <b>9.00</b>  | -          |
| <b>1.00</b>             | <b>9.50</b>  | -          |
| <b>1.00</b>             | <b>10.00</b> | -          |
| <b>1.00</b>             | <b>10.50</b> | -          |
| <b>1.00</b>             | <b>11.00</b> | -          |
| <b>1.00</b>             | <b>11.50</b> | -          |
| <b>1.00</b>             | <b>12.00</b> | -          |
| <b>1.00</b>             | <b>12.50</b> | -          |
| <b>1.00</b>             | <b>13.00</b> | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>1.00</b>             | <b>13.50</b> | -          |
| <b>1.00</b>             | <b>14.00</b> | -          |
| <b>1.00</b>             | <b>14.50</b> | -          |
| <b>1.00</b>             | <b>15.00</b> | -          |
| <b>1.00</b>             | <b>15.50</b> | -          |
| <b>1.00</b>             | <b>16.00</b> | -          |
| <b>1.00</b>             | <b>16.50</b> | -          |
| <b>1.00</b>             | <b>17.00</b> | -          |
| <b>1.00</b>             | <b>17.50</b> | -          |
| <b>1.00</b>             | <b>18.00</b> | -          |
| <b>1.00</b>             | <b>18.50</b> | -          |
| <b>1.00</b>             | <b>19.00</b> | -          |
| <b>1.00</b>             | <b>19.50</b> | -          |
| <b>1.00</b>             | <b>20.00</b> | -          |
| <b>1.00</b>             | <b>20.50</b> | -          |
| <b>1.00</b>             | <b>21.00</b> | -          |
| <b>1.00</b>             | <b>21.50</b> | -          |
| <b>1.00</b>             | <b>22.00</b> | -          |
| <b>1.00</b>             | <b>22.50</b> | -          |
| <b>1.00</b>             | <b>23.00</b> | -          |
| <b>1.00</b>             | <b>23.50</b> | -          |
| <b>1.00</b>             | <b>24.00</b> | -          |
| <b>1.00</b>             | <b>24.50</b> | -          |
| 1.00                    | 28.00        | -          |
| 1.00                    | 29.40        | -          |
| 1.00                    | 29.90        | -          |
| 1.00                    | 30.50        | -          |
| 1.00                    | 31.80        | -          |
| 1.00                    | 32.00        | -          |
| 1.00                    | 39.00        | -          |
| 1.00                    | 42.00        | -          |
| 1.00                    | 60.00        | -          |
| 1.02                    | 1.78         | BS606      |
| 1.02                    | 2.54         | BS607      |
| 1.15                    | 42.10        | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| 1.19                    | 4.32         | -          |
| 1.20                    | 2.50         | -          |
| 1.20                    | 2.60         | -          |
| 1.20                    | 3.50         | -          |
| 1.20                    | 5.00         | -          |
| 1.20                    | 24.00        | -          |
| 1.20                    | 26.00        | -          |
| 1.20                    | 28.00        | -          |
| 1.20                    | 35.00        | -          |
| 1.20                    | 40.00        | -          |
| 1.20                    | 53.50        | -          |
| 1.20                    | 98.00        | -          |
| 1.25                    | 3.80         | -          |
| 1.25                    | 8.00         | -          |
| 1.25                    | 16.00        | -          |
| 1.27                    | 3.25         | -          |
| 1.27                    | 3.91         | -          |
| 1.27                    | 4.47         | -          |
| 1.30                    | 2.50         | -          |
| 1.30                    | 8.00         | -          |
| 1.30                    | 10.00        | -          |
| <b>1.30</b>             | <b>11.00</b> | -          |
| 1.30                    | 13.50        | -          |
| 1.30                    | 20.00        | -          |
| 1.50                    | 1.80         | -          |
| 1.50                    | 1.85         | -          |
| 1.50                    | 2.00         | -          |
| <b>1.50</b>             | <b>2.50</b>  | S3         |
| 1.50                    | 2.80         | -          |
| <b>1.50</b>             | <b>3.00</b>  | -          |
| <b>1.50</b>             | <b>3.50</b>  | S4         |
| <b>1.50</b>             | <b>4.00</b>  | -          |
| <b>1.50</b>             | <b>4.50</b>  | S5         |
| <b>1.50</b>             | <b>5.00</b>  | -          |
| <b>1.50</b>             | <b>5.50</b>  | S6         |
| <b>1.50</b>             | <b>6.00</b>  | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

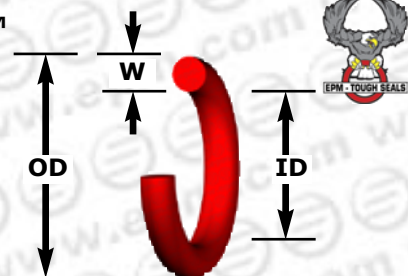
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>1.50</b>             | <b>6.50</b>  | S7         |
| <b>1.50</b>             | <b>7.00</b>  | -          |
| <b>1.50</b>             | <b>7.50</b>  | S8         |
| <b>1.50</b>             | <b>8.00</b>  | -          |
| <b>1.50</b>             | <b>8.50</b>  | S9         |
| <b>1.50</b>             | <b>9.00</b>  | -          |
| <b>1.50</b>             | <b>9.50</b>  | S10        |
| <b>1.50</b>             | <b>10.00</b> | -          |
| 1.50                    | 10.50        | -          |
| <b>1.50</b>             | <b>10.70</b> | S11.2      |
| <b>1.50</b>             | <b>11.00</b> | -          |
| <b>1.50</b>             | <b>11.50</b> | S12        |
| <b>1.50</b>             | <b>12.00</b> | S12.5      |
| 1.50                    | 12.50        | -          |
| <b>1.50</b>             | <b>13.00</b> | -          |
| 1.50                    | 13.25        | -          |
| <b>1.50</b>             | <b>13.50</b> | S14        |
| <b>1.50</b>             | <b>14.00</b> | -          |
| <b>1.50</b>             | <b>14.50</b> | S15        |
| <b>1.50</b>             | <b>15.00</b> | -          |
| <b>1.50</b>             | <b>15.50</b> | S16        |
| <b>1.50</b>             | <b>16.00</b> | -          |
| 1.50                    | 16.50        | -          |
| <b>1.50</b>             | <b>17.00</b> | -          |
| <b>1.50</b>             | <b>17.50</b> | S18        |
| <b>1.50</b>             | <b>18.00</b> | -          |
| 1.50                    | 18.50        | -          |
| <b>1.50</b>             | <b>19.00</b> | -          |
| <b>1.50</b>             | <b>19.50</b> | S20        |
| <b>1.50</b>             | <b>20.00</b> | -          |
| 1.50                    | 20.50        | -          |
| <b>1.50</b>             | <b>21.00</b> | -          |
| <b>1.50</b>             | <b>21.50</b> | S22        |
| <b>1.50</b>             | <b>22.00</b> | -          |
| 1.50                    | 22.50        | -          |
| <b>1.50</b>             | <b>23.00</b> | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| 1.50                    | 23.50        | -          |
| <b>1.50</b>             | <b>24.00</b> | -          |
| 1.50                    | 24.50        | -          |
| <b>1.50</b>             | <b>25.00</b> | -          |
| 1.50                    | 25.50        | -          |
| <b>1.50</b>             | <b>26.00</b> | -          |
| 1.50                    | 26.50        | -          |
| <b>1.50</b>             | <b>27.00</b> | -          |
| 1.50                    | 27.50        | -          |
| <b>1.50</b>             | <b>28.00</b> | -          |
| 1.50                    | 28.50        | -          |
| <b>1.50</b>             | <b>29.00</b> | -          |
| 1.50                    | 29.50        | -          |
| <b>1.50</b>             | <b>30.00</b> | -          |
| 1.50                    | 30.50        | -          |
| <b>1.50</b>             | <b>31.00</b> | -          |
| 1.50                    | 31.50        | -          |
| <b>1.50</b>             | <b>32.00</b> | -          |
| 1.50                    | 32.50        | -          |
| <b>1.50</b>             | <b>33.00</b> | -          |
| 1.50                    | 33.50        | -          |
| <b>1.50</b>             | <b>34.00</b> | -          |
| 1.50                    | 34.50        | -          |
| <b>1.50</b>             | <b>35.00</b> | -          |
| 1.50                    | 35.50        | -          |
| <b>1.50</b>             | <b>36.00</b> | -          |
| 1.50                    | 36.50        | -          |
| <b>1.50</b>             | <b>37.00</b> | -          |
| 1.50                    | 37.50        | -          |
| <b>1.50</b>             | <b>38.00</b> | -          |
| 1.50                    | 38.50        | -          |
| <b>1.50</b>             | <b>39.00</b> | -          |
| 1.50                    | 39.50        | -          |
| <b>1.50</b>             | <b>40.00</b> | -          |
| <b>1.50</b>             | <b>41.00</b> | -          |
| <b>1.50</b>             | <b>42.00</b> | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>1.50</b>             | <b>43.00</b> | -          |
| <b>1.50</b>             | <b>44.00</b> | -          |
| <b>1.50</b>             | <b>45.00</b> | -          |
| <b>1.50</b>             | <b>46.00</b> | -          |
| <b>1.50</b>             | <b>47.00</b> | -          |
| <b>1.50</b>             | <b>48.00</b> | -          |
| <b>1.50</b>             | <b>49.00</b> | -          |
| <b>1.50</b>             | <b>50.00</b> | -          |
| <b>1.50</b>             | <b>51.00</b> | -          |
| <b>1.50</b>             | <b>52.00</b> | -          |
| <b>1.50</b>             | <b>53.00</b> | -          |
| <b>1.50</b>             | <b>54.00</b> | -          |
| <b>1.50</b>             | <b>55.00</b> | -          |
| <b>1.50</b>             | <b>56.00</b> | -          |
| <b>1.50</b>             | <b>57.00</b> | -          |
| <b>1.50</b>             | <b>58.00</b> | -          |
| <b>1.50</b>             | <b>59.00</b> | -          |
| <b>1.50</b>             | <b>60.00</b> | -          |
| <b>1.50</b>             | <b>61.00</b> | -          |
| <b>1.50</b>             | <b>62.00</b> | -          |
| <b>1.50</b>             | <b>63.00</b> | -          |
| <b>1.50</b>             | <b>64.00</b> | -          |
| <b>1.50</b>             | <b>65.00</b> | -          |
| <b>1.50</b>             | <b>66.00</b> | -          |
| <b>1.50</b>             | <b>67.00</b> | -          |
| <b>1.50</b>             | <b>68.00</b> | -          |
| <b>1.50</b>             | <b>69.00</b> | -          |
| <b>1.50</b>             | <b>70.00</b> | -          |
| <b>1.50</b>             | <b>71.00</b> | -          |
| <b>1.50</b>             | <b>72.00</b> | -          |
| 1.50                    | 73.00        | -          |
| 1.50                    | 74.00        | -          |
| 1.50                    | 75.00        | -          |
| 1.50                    | 76.00        | -          |
| <b>1.50</b>             | <b>77.00</b> | -          |
| 1.50                    | 78.00        | -          |

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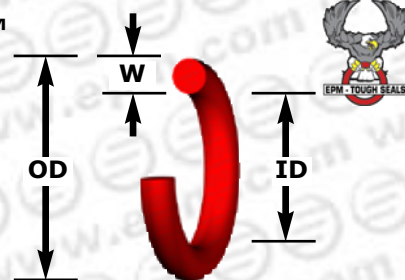
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| 1.50                    | 79.00        | -          |
| 1.50                    | 80.00        | -          |
| 1.50                    | 81.00        | -          |
| 1.50                    | 82.00        | -          |
| 1.50                    | 83.00        | -          |
| 1.50                    | 84.00        | -          |
| 1.50                    | 85.00        | -          |
| 1.50                    | 86.00        | -          |
| 1.50                    | 87.00        | -          |
| 1.50                    | 88.00        | -          |
| 1.50                    | 89.00        | -          |
| 1.50                    | 90.00        | -          |
| 1.50                    | 91.00        | -          |
| 1.50                    | 92.00        | -          |
| 1.50                    | 93.00        | -          |
| 1.50                    | 94.00        | -          |
| <b>1.50</b>             | <b>95.00</b> | -          |
| 1.50                    | 96.00        | -          |
| 1.50                    | 97.00        | -          |
| 1.50                    | 98.00        | -          |
| 1.50                    | 99.00        | -          |
| 1.50                    | 100.00       | -          |
| 1.60                    | 2.20         | -          |
| 1.60                    | 2.75         | -          |
| 1.60                    | 2.80         | -          |
| <b>1.60</b>             | <b>3.10</b>  | -          |
| 1.60                    | 3.20         | -          |
| 1.60                    | 3.70         | -          |
| <b>1.60</b>             | <b>4.10</b>  | -          |
| 1.60                    | 4.70         | -          |
| 1.60                    | 5.00         | -          |
| <b>1.60</b>             | <b>5.10</b>  | -          |
| <b>1.60</b>             | <b>6.10</b>  | -          |
| <b>1.60</b>             | <b>7.10</b>  | -          |
| <b>1.60</b>             | <b>8.10</b>  | -          |
| <b>1.60</b>             | <b>9.10</b>  | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>1.60</b>             | <b>10.10</b> | -          |
| <b>1.60</b>             | <b>11.10</b> | -          |
| <b>1.60</b>             | <b>12.10</b> | -          |
| <b>1.60</b>             | <b>13.10</b> | -          |
| <b>1.60</b>             | <b>14.10</b> | -          |
| <b>1.60</b>             | <b>15.10</b> | -          |
| <b>1.60</b>             | <b>16.10</b> | -          |
| <b>1.60</b>             | <b>17.10</b> | -          |
| <b>1.60</b>             | <b>18.10</b> | -          |
| <b>1.60</b>             | <b>19.10</b> | -          |
| 1.60                    | 20.30        | -          |
| 1.60                    | 21.10        | -          |
| <b>1.60</b>             | <b>22.10</b> | -          |
| <b>1.60</b>             | <b>25.10</b> | -          |
| <b>1.60</b>             | <b>27.10</b> | -          |
| <b>1.60</b>             | <b>29.10</b> | -          |
| <b>1.60</b>             | <b>32.10</b> | -          |
| <b>1.60</b>             | <b>35.10</b> | -          |
| <b>1.60</b>             | <b>37.10</b> | -          |
| 1.60                    | 51.10        | -          |
| 1.60                    | 86.00        | -          |
| 1.60                    | 96.60        | -          |
| 1.60                    | 115.00       | -          |
| 1.78                    | 3.17         | BS801      |
| 1.78                    | 4.76         | BS802      |
| 1.78                    | 6.35         | BS803      |
| 1.78                    | 6.75         | BS610      |
| 1.78                    | 7.94         | BS804      |
| 1.78                    | 8.73         | BS611      |
| 1.78                    | 9.52         | -          |
| 1.78                    | 11.11        | BS806      |
| 1.78                    | 11.91        | -          |
| 1.78                    | 19.05        | -          |
| 1.78                    | 19.15        | -          |
| 1.78                    | 21.47        | -          |
| 1.78                    | 36.00        | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 1.78                    | 36.27     | BS517      |
| 1.78                    | 39.45     | BS519      |
| 1.78                    | 45.84     | -          |
| 1.78                    | 79.00     | BS532      |
| 1.78                    | 85.34     | BS534      |
| 1.78                    | 91.70     | BS536      |
| 1.78                    | 98.05     | BS538      |
| 1.78                    | 104.40    | BS540      |
| 1.78                    | 110.74    | BS542      |
| 1.78                    | 117.10    | BS544      |
| 1.78                    | 123.44    | BS546      |
| 1.78                    | 129.40    | BS548      |
| 1.78                    | 135.76    | BS550      |
| 1.78                    | 138.94    | BS551      |
| 1.78                    | 142.11    | BS552      |
| 1.78                    | 145.29    | BS553      |
| 1.78                    | 148.46    | BS554      |
| 1.78                    | 151.64    | BS555      |
| 1.78                    | 154.81    | BS556      |
| 1.78                    | 158.00    | BS557      |
| 1.78                    | 161.16    | BS558      |
| 1.78                    | 164.34    | BS559      |
| 1.78                    | 167.51    | BS560      |
| 1.78                    | 170.69    | BS561      |
| 1.78                    | 173.87    | BS562      |
| 1.80                    | 1.80      | -          |
| 1.80                    | 2.00      | -          |
| 1.80                    | 2.24      | -          |
| 1.80                    | 2.50      | -          |
| 1.80                    | 2.80      | -          |
| 1.80                    | 3.15      | -          |
| 1.80                    | 3.55      | -          |
| 1.80                    | 3.75      | -          |
| 1.80                    | 4.00      | -          |
| 1.80                    | 4.50      | -          |
| 1.80                    | 4.87      | -          |

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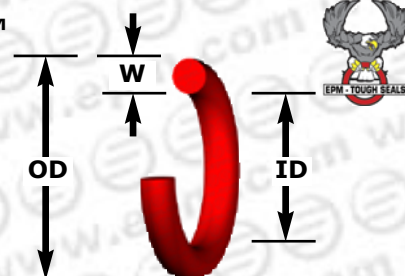
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| 1.80                    | 5.00         | -          |
| 1.80                    | 5.15         | -          |
| 1.80                    | 5.30         | -          |
| 1.80                    | 5.60         | -          |
| 1.80                    | 6.00         | -          |
| <b>1.80</b>             | <b>6.30</b>  | -          |
| 1.80                    | 6.70         | -          |
| 1.80                    | 6.90         | -          |
| 1.80                    | 7.10         | -          |
| <b>1.80</b>             | <b>7.50</b>  | -          |
| 1.80                    | 8.00         | -          |
| 1.80                    | 8.50         | -          |
| 1.80                    | 8.76         | -          |
| 1.80                    | 9.00         | -          |
| <b>1.80</b>             | <b>9.50</b>  | -          |
| 1.80                    | 10.00        | -          |
| <b>1.80</b>             | <b>10.60</b> | -          |
| 1.80                    | 11.20        | -          |
| 1.80                    | 11.80        | -          |
| <b>1.80</b>             | <b>12.50</b> | -          |
| 1.80                    | 13.20        | -          |
| 1.80                    | 14.00        | -          |
| 1.80                    | 15.00        | -          |
| 1.80                    | 16.00        | -          |
| 1.80                    | 17.00        | -          |
| 1.90                    | 2.40         | -          |
| 1.90                    | 2.60         | -          |
| <b>1.90</b>             | <b>2.80</b>  | P3         |
| 1.90                    | 3.40         | -          |
| 1.90                    | 3.70         | -          |
| <b>1.90</b>             | <b>3.80</b>  | P4         |
| 1.90                    | 4.20         | -          |
| <b>1.90</b>             | <b>4.80</b>  | P5         |
| 1.90                    | 4.90         | -          |
| 1.90                    | 5.70         | -          |
| <b>1.90</b>             | <b>5.80</b>  | P6         |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| 1.90                    | 6.40         | -          |
| <b>1.90</b>             | <b>6.80</b>  | P7         |
| 1.90                    | 7.20         | -          |
| <b>1.90</b>             | <b>7.80</b>  | P8         |
| 1.90                    | 8.00         | -          |
| <b>1.90</b>             | <b>8.80</b>  | P9         |
| 1.90                    | 8.90         | -          |
| <b>1.90</b>             | <b>9.80</b>  | P10        |
| 1.90                    | 67.10        | -          |
| 2.00                    | 2.00         | -          |
| <b>2.00</b>             | <b>2.50</b>  | -          |
| 2.00                    | 2.60         | -          |
| <b>2.00</b>             | <b>3.00</b>  | -          |
| <b>2.00</b>             | <b>3.50</b>  | -          |
| <b>2.00</b>             | <b>4.00</b>  | -          |
| <b>2.00</b>             | <b>4.50</b>  | -          |
| 2.00                    | 4.60         | -          |
| <b>2.00</b>             | <b>5.00</b>  | -          |
| <b>2.00</b>             | <b>5.50</b>  | -          |
| <b>2.00</b>             | <b>6.00</b>  | -          |
| <b>2.00</b>             | <b>6.50</b>  | -          |
| <b>2.00</b>             | <b>7.00</b>  | -          |
| 2.00                    | 7.50         | -          |
| <b>2.00</b>             | <b>8.00</b>  | -          |
| <b>2.00</b>             | <b>8.50</b>  | -          |
| <b>2.00</b>             | <b>9.00</b>  | -          |
| <b>2.00</b>             | <b>9.50</b>  | -          |
| <b>2.00</b>             | <b>10.00</b> | -          |
| <b>2.00</b>             | <b>10.50</b> | -          |
| <b>2.00</b>             | <b>11.00</b> | -          |
| <b>2.00</b>             | <b>11.50</b> | -          |
| <b>2.00</b>             | <b>12.00</b> | -          |
| <b>2.00</b>             | <b>12.50</b> | -          |
| <b>2.00</b>             | <b>13.00</b> | -          |
| <b>2.00</b>             | <b>13.50</b> | -          |
| <b>2.00</b>             | <b>14.00</b> | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>2.00</b>             | <b>14.50</b> | -          |
| <b>2.00</b>             | <b>15.00</b> | -          |
| 2.00                    | 15.50        | -          |
| <b>2.00</b>             | <b>16.00</b> | -          |
| 2.00                    | 16.50        | -          |
| <b>2.00</b>             | <b>17.00</b> | -          |
| <b>2.00</b>             | <b>17.50</b> | -          |
| <b>2.00</b>             | <b>18.00</b> | -          |
| <b>2.00</b>             | <b>18.50</b> | -          |
| <b>2.00</b>             | <b>19.00</b> | -          |
| <b>2.00</b>             | <b>19.50</b> | -          |
| <b>2.00</b>             | <b>20.00</b> | -          |
| <b>2.00</b>             | <b>20.50</b> | -          |
| <b>2.00</b>             | <b>21.00</b> | -          |
| 2.00                    | 21.50        | -          |
| <b>2.00</b>             | <b>21.90</b> | S22.4      |
| <b>2.00</b>             | <b>22.00</b> | -          |
| <b>2.00</b>             | <b>22.50</b> | -          |
| <b>2.00</b>             | <b>23.00</b> | -          |
| <b>2.00</b>             | <b>23.50</b> | S24        |
| <b>2.00</b>             | <b>24.00</b> | -          |
| <b>2.00</b>             | <b>24.50</b> | S25        |
| <b>2.00</b>             | <b>25.00</b> | -          |
| <b>2.00</b>             | <b>25.50</b> | S26        |
| <b>2.00</b>             | <b>26.00</b> | -          |
| <b>2.00</b>             | <b>26.50</b> | -          |
| <b>2.00</b>             | <b>27.00</b> | -          |
| <b>2.00</b>             | <b>27.50</b> | S28        |
| <b>2.00</b>             | <b>28.00</b> | -          |
| <b>2.00</b>             | <b>28.50</b> | S29        |
| <b>2.00</b>             | <b>29.00</b> | -          |
| <b>2.00</b>             | <b>29.50</b> | S30        |
| <b>2.00</b>             | <b>30.00</b> | -          |
| <b>2.00</b>             | <b>30.50</b> | -          |
| <b>2.00</b>             | <b>31.00</b> | S31.5      |
| <b>2.00</b>             | <b>31.50</b> | S32        |



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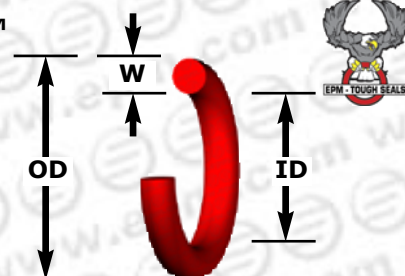
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**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 2.00                    | 32.00     | -          |
| 2.00                    | 32.50     | -          |
| 2.00                    | 33.00     | -          |
| 2.00                    | 33.50     | S34        |
| 2.00                    | 34.00     | -          |
| 2.00                    | 34.50     | S35        |
| 2.00                    | 35.00     | S35.5      |
| 2.00                    | 35.50     | S36        |
| 2.00                    | 36.00     | -          |
| 2.00                    | 36.50     | -          |
| 2.00                    | 37.00     | -          |
| 2.00                    | 37.50     | S38        |
| 2.00                    | 38.00     | -          |
| 2.00                    | 38.50     | S39        |
| 2.00                    | 39.00     | -          |
| 2.00                    | 39.50     | S40        |
| 2.00                    | 40.00     | -          |
| 2.00                    | 41.00     | -          |
| 2.00                    | 41.50     | S42        |
| 2.00                    | 42.00     | -          |
| 2.00                    | 42.50     | S43        |
| 2.00                    | 43.00     | -          |
| 2.00                    | 43.50     | S44        |
| 2.00                    | 44.00     | -          |
| 2.00                    | 44.50     | S45        |
| 2.00                    | 45.00     | -          |
| 2.00                    | 45.50     | S46        |
| 2.00                    | 46.00     | -          |
| 2.00                    | 47.00     | -          |
| 2.00                    | 47.50     | S48        |
| 2.00                    | 48.00     | -          |
| 2.00                    | 49.00     | -          |
| 2.00                    | 49.50     | S50        |
| 2.00                    | 50.00     | -          |
| 2.00                    | 51.00     | -          |
| 2.00                    | 52.00     | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 2.00                    | 52.50     | S53        |
| 2.00                    | 53.00     | -          |
| 2.00                    | 54.00     | -          |
| 2.00                    | 54.50     | S55        |
| 2.00                    | 55.00     | -          |
| 2.00                    | 55.50     | S56        |
| 2.00                    | 56.00     | -          |
| 2.00                    | 57.00     | -          |
| 2.00                    | 58.00     | -          |
| 2.00                    | 59.00     | -          |
| 2.00                    | 59.50     | S60        |
| 2.00                    | 60.00     | -          |
| 2.00                    | 61.00     | -          |
| 2.00                    | 62.00     | -          |
| 2.00                    | 62.50     | S63        |
| 2.00                    | 63.00     | -          |
| 2.00                    | 64.00     | -          |
| 2.00                    | 64.50     | S65        |
| 2.00                    | 65.00     | -          |
| 2.00                    | 66.00     | -          |
| 2.00                    | 66.50     | S67        |
| 2.00                    | 67.00     | -          |
| 2.00                    | 68.00     | -          |
| 2.00                    | 69.00     | -          |
| 2.00                    | 69.50     | S70        |
| 2.00                    | 70.00     | -          |
| 2.00                    | 70.50     | S71        |
| 2.00                    | 71.00     | -          |
| 2.00                    | 72.00     | -          |
| 2.00                    | 73.00     | -          |
| 2.00                    | 74.00     | -          |
| 2.00                    | 74.50     | S75        |
| 2.00                    | 75.00     | -          |
| 2.00                    | 76.00     | -          |
| 2.00                    | 77.00     | -          |
| 2.00                    | 78.00     | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 2.00                    | 79.00     | -          |
| 2.00                    | 79.50     | S80        |
| 2.00                    | 80.00     | -          |
| 2.00                    | 81.00     | -          |
| 2.00                    | 82.00     | -          |
| 2.00                    | 83.00     | -          |
| 2.00                    | 84.00     | -          |
| 2.00                    | 84.50     | S85        |
| 2.00                    | 85.00     | -          |
| 2.00                    | 86.00     | -          |
| 2.00                    | 87.00     | -          |
| 2.00                    | 88.00     | -          |
| 2.00                    | 89.00     | -          |
| 2.00                    | 89.50     | S90        |
| 2.00                    | 90.00     | -          |
| 2.00                    | 91.00     | -          |
| 2.00                    | 92.00     | -          |
| 2.00                    | 93.00     | -          |
| 2.00                    | 94.00     | -          |
| 2.00                    | 94.50     | S95        |
| 2.00                    | 95.00     | -          |
| 2.00                    | 96.00     | -          |
| 2.00                    | 97.00     | -          |
| 2.00                    | 98.00     | -          |
| 2.00                    | 99.00     | -          |
| 2.00                    | 99.50     | S100       |
| 2.00                    | 100.00    | -          |
| 2.00                    | 102.00    | -          |
| 2.00                    | 104.50    | S105       |
| 2.00                    | 105.00    | -          |
| 2.00                    | 109.00    | -          |
| 2.00                    | 109.50    | S110       |
| 2.00                    | 110.00    | -          |
| 2.00                    | 111.50    | S112       |
| 2.00                    | 114.50    | S115       |
| 2.00                    | 115.00    | -          |

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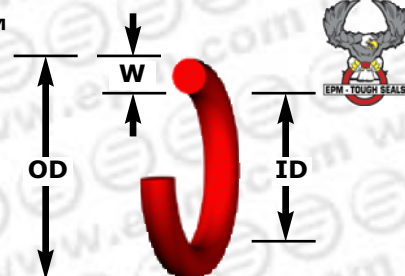
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**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| <b>2.00</b>             | <b>119.50</b> | S120       |
| 2.00                    | 120.00        | -          |
| <b>2.00</b>             | <b>124.50</b> | S125       |
| 2.00                    | 125.60        | -          |
| <b>2.00</b>             | <b>129.50</b> | S130       |
| 2.00                    | 130.00        | -          |
| <b>2.00</b>             | <b>131.50</b> | S132       |
| <b>2.00</b>             | <b>134.50</b> | S135       |
| <b>2.00</b>             | <b>139.50</b> | S140       |
| 2.00                    | 140.00        | -          |
| <b>2.00</b>             | <b>144.50</b> | S145       |
| <b>2.00</b>             | <b>149.50</b> | S150       |
| 2.00                    | 165.00        | -          |
| 2.00                    | 180.00        | -          |
| 2.20                    | 12.40         | -          |
| 2.20                    | 6.00          | -          |
| 2.20                    | 9.00          | -          |
| 2.20                    | 10.00         | -          |
| 2.20                    | 18.00         | -          |
| <b>2.40</b>             | <b>3.30</b>   | -          |
| <b>2.40</b>             | <b>3.60</b>   | -          |
| <b>2.40</b>             | <b>4.30</b>   | -          |
| <b>2.40</b>             | <b>4.60</b>   | -          |
| <b>2.40</b>             | <b>5.30</b>   | -          |
| 2.40                    | 5.50          | -          |
| <b>2.40</b>             | <b>5.60</b>   | -          |
| <b>2.40</b>             | <b>6.30</b>   | -          |
| <b>2.40</b>             | <b>6.60</b>   | -          |
| <b>2.40</b>             | <b>7.30</b>   | -          |
| 2.40                    | 7.50          | -          |
| <b>2.40</b>             | <b>7.60</b>   | -          |
| 2.40                    | 8.00          | -          |
| <b>2.40</b>             | <b>8.30</b>   | -          |
| <b>2.40</b>             | <b>8.60</b>   | -          |
| <b>2.40</b>             | <b>9.30</b>   | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>2.40</b>             | <b>9.60</b>  | -          |
| <b>2.40</b>             | <b>9.80</b>  | P10A       |
| <b>2.40</b>             | <b>10.30</b> | -          |
| 2.40                    | 10.50        | -          |
| <b>2.40</b>             | <b>10.60</b> | -          |
| <b>2.40</b>             | <b>10.80</b> | P11        |
| <b>2.40</b>             | <b>11.00</b> | P11.2      |
| <b>2.40</b>             | <b>11.30</b> | -          |
| 2.40                    | 11.50        | -          |
| <b>2.40</b>             | <b>11.60</b> | -          |
| <b>2.40</b>             | <b>11.80</b> | P12        |
| <b>2.40</b>             | <b>12.30</b> | P12.5      |
| <b>2.40</b>             | <b>12.60</b> | -          |
| <b>2.40</b>             | <b>13.30</b> | -          |
| 2.40                    | 13.50        | -          |
| <b>2.40</b>             | <b>13.60</b> | -          |
| <b>2.40</b>             | <b>13.80</b> | P14        |
| <b>2.40</b>             | <b>14.30</b> | -          |
| 2.40                    | 14.50        | -          |
| <b>2.40</b>             | <b>14.60</b> | -          |
| <b>2.40</b>             | <b>14.80</b> | P15        |
| <b>2.40</b>             | <b>15.30</b> | -          |
| 2.40                    | 15.50        | -          |
| <b>2.40</b>             | <b>15.60</b> | -          |
| <b>2.40</b>             | <b>15.80</b> | P16        |
| 2.40                    | 15.90        | -          |
| <b>2.40</b>             | <b>16.30</b> | -          |
| <b>2.40</b>             | <b>16.60</b> | -          |
| <b>2.40</b>             | <b>17.30</b> | -          |
| 2.40                    | 17.50        | -          |
| <b>2.40</b>             | <b>17.60</b> | -          |
| <b>2.40</b>             | <b>17.80</b> | P18        |
| 2.40                    | 18.30        | -          |
| <b>2.40</b>             | <b>18.60</b> | -          |
| 2.40                    | 19.30        | -          |
| <b>2.40</b>             | <b>19.60</b> | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>2.40</b>             | <b>19.80</b> | P20        |
| 2.40                    | 20.30        | -          |
| 2.40                    | 20.50        | -          |
| <b>2.40</b>             | <b>20.80</b> | P21        |
| 2.40                    | 21.30        | -          |
| 2.40                    | 21.50        | -          |
| <b>2.40</b>             | <b>21.60</b> | -          |
| <b>2.40</b>             | <b>21.80</b> | P22        |
| 2.40                    | 22.30        | -          |
| 2.40                    | 22.60        | -          |
| 2.40                    | 23.30        | -          |
| 2.40                    | 23.50        | -          |
| 2.40                    | 23.60        | -          |
| 2.40                    | 24.30        | -          |
| 2.40                    | 24.50        | -          |
| <b>2.40</b>             | <b>24.60</b> | -          |
| 2.40                    | 25.00        | -          |
| 2.40                    | 25.30        | -          |
| 2.40                    | 25.60        | -          |
| 2.40                    | 27.30        | -          |
| 2.40                    | 27.50        | -          |
| <b>2.40</b>             | <b>27.60</b> | -          |
| <b>2.40</b>             | <b>29.60</b> | -          |
| 2.40                    | 30.30        | -          |
| <b>2.40</b>             | <b>31.60</b> | -          |
| 2.40                    | 33.30        | -          |
| <b>2.40</b>             | <b>34.60</b> | -          |
| 2.40                    | 36.50        | -          |
| <b>2.40</b>             | <b>37.60</b> | -          |
| <b>2.40</b>             | <b>39.60</b> | -          |
| <b>2.40</b>             | <b>41.60</b> | -          |
| <b>2.40</b>             | <b>44.60</b> | -          |
| <b>2.40</b>             | <b>47.60</b> | -          |
| <b>2.40</b>             | <b>49.60</b> | -          |
| <b>2.40</b>             | <b>51.60</b> | -          |
| <b>2.40</b>             | <b>54.60</b> | -          |

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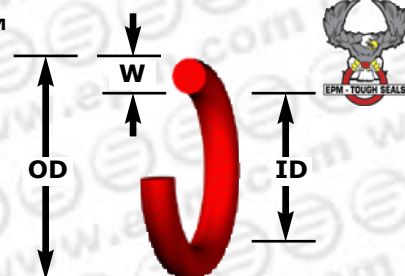
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>2.40</b>             | <b>57.60</b> | -          |
| <b>2.40</b>             | <b>59.60</b> | -          |
| <b>2.40</b>             | <b>61.60</b> | -          |
| <b>2.40</b>             | <b>64.60</b> | -          |
| <b>2.40</b>             | <b>67.60</b> | -          |
| <b>2.40</b>             | <b>69.60</b> | -          |
| 2.40                    | 161.60       | -          |
| <b>2.50</b>             | <b>4.00</b>  | -          |
| 2.50                    | 4.60         | -          |
| <b>2.50</b>             | <b>5.00</b>  | -          |
| 2.50                    | 5.50         | -          |
| <b>2.50</b>             | <b>6.00</b>  | -          |
| <b>2.50</b>             | <b>6.50</b>  | -          |
| <b>2.50</b>             | <b>7.00</b>  | -          |
| <b>2.50</b>             | <b>7.50</b>  | -          |
| <b>2.50</b>             | <b>8.00</b>  | -          |
| <b>2.50</b>             | <b>8.50</b>  | -          |
| <b>2.50</b>             | <b>9.00</b>  | -          |
| <b>2.50</b>             | <b>9.50</b>  | -          |
| <b>2.50</b>             | <b>10.00</b> | -          |
| <b>2.50</b>             | <b>10.50</b> | -          |
| <b>2.50</b>             | <b>11.00</b> | -          |
| <b>2.50</b>             | <b>11.50</b> | -          |
| <b>2.50</b>             | <b>12.00</b> | -          |
| <b>2.50</b>             | <b>12.50</b> | -          |
| <b>2.50</b>             | <b>13.00</b> | -          |
| <b>2.50</b>             | <b>13.50</b> | -          |
| <b>2.50</b>             | <b>14.00</b> | -          |
| 2.50                    | 14.50        | -          |
| <b>2.50</b>             | <b>15.00</b> | -          |
| <b>2.50</b>             | <b>15.50</b> | -          |
| <b>2.50</b>             | <b>16.00</b> | -          |
| <b>2.50</b>             | <b>16.50</b> | -          |
| <b>2.50</b>             | <b>17.00</b> | -          |
| <b>2.50</b>             | <b>17.50</b> | -          |
| <b>2.50</b>             | <b>18.00</b> | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| 2.50                    | 18.50        | -          |
| <b>2.50</b>             | <b>19.00</b> | -          |
| <b>2.50</b>             | <b>19.50</b> | -          |
| <b>2.50</b>             | <b>20.00</b> | -          |
| 2.50                    | 20.50        | -          |
| <b>2.50</b>             | <b>21.00</b> | -          |
| <b>2.50</b>             | <b>21.50</b> | -          |
| <b>2.50</b>             | <b>22.00</b> | -          |
| <b>2.50</b>             | <b>22.50</b> | -          |
| <b>2.50</b>             | <b>23.00</b> | -          |
| <b>2.50</b>             | <b>23.50</b> | -          |
| <b>2.50</b>             | <b>24.00</b> | -          |
| 2.50                    | 24.50        | -          |
| <b>2.50</b>             | <b>25.00</b> | -          |
| <b>2.50</b>             | <b>25.50</b> | -          |
| <b>2.50</b>             | <b>26.00</b> | -          |
| <b>2.50</b>             | <b>26.50</b> | -          |
| <b>2.50</b>             | <b>27.00</b> | -          |
| 2.50                    | 27.50        | -          |
| <b>2.50</b>             | <b>28.00</b> | -          |
| 2.50                    | 28.50        | -          |
| <b>2.50</b>             | <b>29.00</b> | -          |
| 2.50                    | 29.50        | -          |
| <b>2.50</b>             | <b>30.00</b> | -          |
| 2.50                    | 30.50        | -          |
| <b>2.50</b>             | <b>31.00</b> | -          |
| 2.50                    | 31.50        | -          |
| <b>2.50</b>             | <b>32.00</b> | -          |
| <b>2.50</b>             | <b>32.50</b> | -          |
| <b>2.50</b>             | <b>33.00</b> | -          |
| <b>2.50</b>             | <b>33.50</b> | -          |
| <b>2.50</b>             | <b>34.00</b> | -          |
| <b>2.50</b>             | <b>34.50</b> | -          |
| <b>2.50</b>             | <b>35.00</b> | -          |
| <b>2.50</b>             | <b>35.50</b> | -          |
| <b>2.50</b>             | <b>36.00</b> | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>2.50</b>             | <b>36.50</b> | -          |
| <b>2.50</b>             | <b>37.00</b> | -          |
| 2.50                    | 37.50        | -          |
| <b>2.50</b>             | <b>38.00</b> | -          |
| <b>2.50</b>             | <b>38.50</b> | -          |
| <b>2.50</b>             | <b>39.00</b> | -          |
| <b>2.50</b>             | <b>39.50</b> | -          |
| <b>2.50</b>             | <b>40.00</b> | -          |
| <b>2.50</b>             | <b>41.00</b> | -          |
| <b>2.50</b>             | <b>42.00</b> | -          |
| <b>2.50</b>             | <b>43.00</b> | -          |
| <b>2.50</b>             | <b>44.00</b> | -          |
| <b>2.50</b>             | <b>45.00</b> | -          |
| <b>2.50</b>             | <b>46.00</b> | -          |
| <b>2.50</b>             | <b>47.00</b> | -          |
| <b>2.50</b>             | <b>48.00</b> | -          |
| <b>2.50</b>             | <b>49.00</b> | -          |
| <b>2.50</b>             | <b>50.00</b> | -          |
| <b>2.50</b>             | <b>51.00</b> | -          |
| <b>2.50</b>             | <b>52.00</b> | -          |
| <b>2.50</b>             | <b>53.00</b> | -          |
| <b>2.50</b>             | <b>54.00</b> | -          |
| <b>2.50</b>             | <b>55.00</b> | -          |
| <b>2.50</b>             | <b>56.00</b> | -          |
| <b>2.50</b>             | <b>57.00</b> | -          |
| <b>2.50</b>             | <b>58.00</b> | -          |
| <b>2.50</b>             | <b>59.00</b> | -          |
| <b>2.50</b>             | <b>60.00</b> | -          |
| <b>2.50</b>             | <b>61.00</b> | -          |
| <b>2.50</b>             | <b>62.00</b> | -          |
| <b>2.50</b>             | <b>63.00</b> | -          |
| <b>2.50</b>             | <b>64.00</b> | -          |
| <b>2.50</b>             | <b>65.00</b> | -          |
| <b>2.50</b>             | <b>66.00</b> | -          |
| <b>2.50</b>             | <b>67.00</b> | -          |
| <b>2.50</b>             | <b>68.00</b> | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

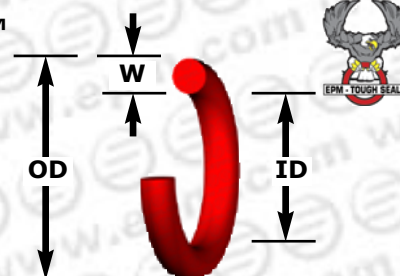
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 2.50                    | 69.00     | -          |
| 2.50                    | 70.00     | -          |
| 2.50                    | 71.00     | -          |
| 2.50                    | 72.00     | -          |
| 2.50                    | 73.00     | -          |
| 2.50                    | 74.00     | -          |
| 2.50                    | 75.00     | -          |
| 2.50                    | 76.00     | -          |
| 2.50                    | 77.00     | -          |
| 2.50                    | 78.00     | -          |
| 2.50                    | 79.00     | -          |
| 2.50                    | 80.00     | -          |
| 2.50                    | 81.00     | -          |
| 2.50                    | 82.00     | -          |
| 2.50                    | 83.00     | -          |
| 2.50                    | 84.00     | -          |
| 2.50                    | 85.00     | -          |
| 2.50                    | 86.00     | -          |
| 2.50                    | 87.00     | -          |
| 2.50                    | 88.00     | -          |
| 2.50                    | 89.00     | -          |
| 2.50                    | 90.00     | -          |
| 2.50                    | 91.00     | -          |
| 2.50                    | 92.00     | -          |
| 2.50                    | 93.00     | -          |
| 2.50                    | 94.00     | BS616      |
| 2.50                    | 95.00     | -          |
| 2.50                    | 96.00     | -          |
| 2.50                    | 97.00     | BS617      |
| 2.50                    | 98.00     | -          |
| 2.50                    | 99.00     | BS813      |
| 2.50                    | 100.00    | -          |
| 2.50                    | 101.00    | -          |
| 2.50                    | 102.00    | BS641      |
| 2.50                    | 103.00    | -          |
| 2.50                    | 104.00    | BS643      |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 2.50                    | 105.00        | -          |
| 2.50                    | 106.00        | -          |
| <b>2.50</b>             | <b>107.00</b> | -          |
| 2.50                    | 108.00        | -          |
| 2.50                    | 109.00        | -          |
| 2.50                    | 110.00        | -          |
| 2.50                    | 111.00        | -          |
| 2.50                    | 112.00        | -          |
| 2.50                    | 113.00        | -          |
| 2.50                    | 114.00        | -          |
| <b>2.50</b>             | <b>115.00</b> | -          |
| 2.50                    | 116.00        | -          |
| 2.50                    | 117.00        | -          |
| 2.50                    | 118.00        | -          |
| 2.50                    | 119.00        | -          |
| <b>2.50</b>             | <b>120.00</b> | -          |
| 2.50                    | 121.00        | -          |
| 2.50                    | 122.00        | -          |
| 2.50                    | 123.00        | -          |
| 2.50                    | 124.00        | -          |
| 2.50                    | 125.00        | -          |
| 2.50                    | 126.00        | -          |
| 2.50                    | 127.00        | -          |
| 2.50                    | 128.00        | -          |
| 2.50                    | 129.00        | -          |
| <b>2.50</b>             | <b>130.00</b> | -          |
| 2.50                    | 131.00        | -          |
| 2.50                    | 132.00        | -          |
| 2.50                    | 133.00        | -          |
| 2.50                    | 134.00        | -          |
| 2.50                    | 135.00        | -          |
| <b>2.50</b>             | <b>136.00</b> | -          |
| 2.50                    | 137.00        | -          |
| 2.50                    | 138.00        | -          |
| 2.50                    | 139.00        | -          |
| 2.50                    | 140.00        | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| 2.50                    | 141.00       | -          |
| 2.50                    | 142.00       | -          |
| 2.50                    | 143.00       | -          |
| 2.50                    | 144.00       | -          |
| 2.50                    | 145.00       | -          |
| 2.50                    | 146.00       | -          |
| 2.50                    | 147.00       | -          |
| 2.50                    | 148.00       | -          |
| 2.50                    | 149.00       | -          |
| 2.50                    | 150.00       | -          |
| 2.62                    | 9.13         | -          |
| <b>2.62</b>             | <b>9.90</b>  | BS613      |
| 2.62                    | 11.91        | BS614      |
| 2.62                    | 12.70        | BS807      |
| 2.62                    | 13.10        | BS615      |
| 2.62                    | 15.08        | -          |
| 2.62                    | 15.88        | BS809      |
| 2.62                    | 17.46        | BS810      |
| 2.62                    | 17.86        | -          |
| 2.62                    | 20.64        | BS812      |
| 2.62                    | 22.23        | -          |
| 2.62                    | 23.81        | BS814      |
| 2.62                    | 74.30        | BS640      |
| 2.62                    | 77.50        | -          |
| 2.62                    | 80.60        | BS642      |
| 2.62                    | 83.80        | -          |
| 2.62                    | 92.75        | -          |
| <b>2.65</b>             | <b>14.00</b> | -          |
| <b>2.65</b>             | <b>15.00</b> | -          |
| <b>2.65</b>             | <b>16.00</b> | -          |
| 2.65                    | 17.00        | -          |
| <b>2.65</b>             | <b>18.00</b> | -          |
| 2.65                    | 19.00        | -          |
| <b>2.65</b>             | <b>20.00</b> | -          |
| 2.65                    | 21.20        | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

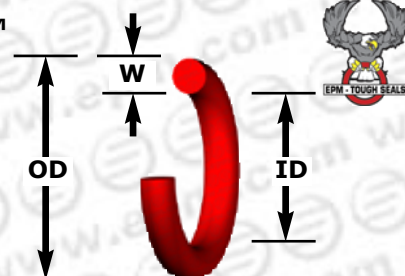
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>2.65</b>             | <b>22.40</b> | -          |
| 2.65                    | 23.60        | -          |
| <b>2.65</b>             | <b>25.00</b> | -          |
| 2.65                    | 25.80        | -          |
| 2.65                    | 26.50        | -          |
| 2.65                    | 28.00        | -          |
| <b>2.65</b>             | <b>30.00</b> | -          |
| 2.65                    | 31.50        | -          |
| 2.65                    | 32.50        | -          |
| <b>2.65</b>             | <b>33.50</b> | -          |
| 2.65                    | 34.50        | -          |
| <b>2.65</b>             | <b>35.50</b> | -          |
| <b>2.65</b>             | <b>36.50</b> | -          |
| 2.65                    | 37.50        | -          |
| 2.65                    | 38.70        | -          |
| 2.70                    | 8.35         | -          |
| 2.70                    | 8.90         | -          |
| 2.70                    | 10.50        | -          |
| 2.70                    | 12.10        | -          |
| 2.70                    | 13.60        | -          |
| 2.70                    | 15.10        | -          |
| 2.70                    | 16.90        | -          |
| 2.70                    | 18.40        | -          |
| 2.70                    | 18.60        | -          |
| 2.70                    | 27.30        | -          |
| 2.70                    | 28.40        | -          |
| 2.70                    | 117.00       | -          |
| 3.00                    | 3.00         | -          |
| 3.00                    | 3.50         | -          |
| 3.00                    | 4.00         | -          |
| 3.00                    | 4.50         | -          |
| <b>3.00</b>             | <b>5.00</b>  | -          |
| <b>3.00</b>             | <b>5.50</b>  | -          |
| <b>3.00</b>             | <b>6.00</b>  | -          |
| <b>3.00</b>             | <b>6.50</b>  | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>3.00</b>             | <b>7.00</b>  | -          |
| <b>3.00</b>             | <b>7.50</b>  | -          |
| <b>3.00</b>             | <b>8.00</b>  | -          |
| <b>3.00</b>             | <b>8.50</b>  | -          |
| <b>3.00</b>             | <b>9.00</b>  | -          |
| <b>3.00</b>             | <b>9.50</b>  | -          |
| <b>3.00</b>             | <b>10.00</b> | -          |
| <b>3.00</b>             | <b>10.50</b> | -          |
| <b>3.00</b>             | <b>11.00</b> | -          |
| <b>3.00</b>             | <b>11.50</b> | -          |
| <b>3.00</b>             | <b>12.00</b> | -          |
| <b>3.00</b>             | <b>12.50</b> | -          |
| <b>3.00</b>             | <b>13.00</b> | -          |
| <b>3.00</b>             | <b>13.50</b> | -          |
| <b>3.00</b>             | <b>14.00</b> | -          |
| <b>3.00</b>             | <b>14.50</b> | -          |
| <b>3.00</b>             | <b>15.00</b> | -          |
| <b>3.00</b>             | <b>15.50</b> | -          |
| <b>3.00</b>             | <b>16.00</b> | -          |
| <b>3.00</b>             | <b>16.50</b> | -          |
| <b>3.00</b>             | <b>17.00</b> | -          |
| <b>3.00</b>             | <b>17.50</b> | -          |
| <b>3.00</b>             | <b>18.00</b> | -          |
| 3.00                    | 18.20        | -          |
| <b>3.00</b>             | <b>18.50</b> | -          |
| <b>3.00</b>             | <b>19.00</b> | -          |
| <b>3.00</b>             | <b>19.20</b> | -          |
| <b>3.00</b>             | <b>19.50</b> | -          |
| <b>3.00</b>             | <b>20.00</b> | -          |
| <b>3.00</b>             | <b>20.50</b> | -          |
| <b>3.00</b>             | <b>21.00</b> | -          |
| <b>3.00</b>             | <b>21.50</b> | -          |
| <b>3.00</b>             | <b>22.00</b> | -          |
| <b>3.00</b>             | <b>22.20</b> | -          |
| <b>3.00</b>             | <b>22.50</b> | -          |
| <b>3.00</b>             | <b>23.00</b> | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>3.00</b>             | <b>23.50</b> | -          |
| <b>3.00</b>             | <b>24.00</b> | -          |
| 3.00                    | 24.20        | -          |
| <b>3.00</b>             | <b>24.50</b> | -          |
| 3.00                    | 24.60        | -          |
| <b>3.00</b>             | <b>25.00</b> | -          |
| 3.00                    | 25.20        | -          |
| <b>3.00</b>             | <b>25.50</b> | -          |
| <b>3.00</b>             | <b>26.00</b> | -          |
| <b>3.00</b>             | <b>26.20</b> | -          |
| <b>3.00</b>             | <b>26.50</b> | -          |
| <b>3.00</b>             | <b>27.00</b> | -          |
| <b>3.00</b>             | <b>27.50</b> | -          |
| <b>3.00</b>             | <b>28.00</b> | -          |
| <b>3.00</b>             | <b>28.50</b> | -          |
| <b>3.00</b>             | <b>29.00</b> | -          |
| <b>3.00</b>             | <b>29.20</b> | -          |
| <b>3.00</b>             | <b>29.50</b> | -          |
| <b>3.00</b>             | <b>30.00</b> | -          |
| 3.00                    | 30.20        | -          |
| <b>3.00</b>             | <b>30.50</b> | -          |
| <b>3.00</b>             | <b>31.00</b> | -          |
| <b>3.00</b>             | <b>31.50</b> | -          |
| <b>3.00</b>             | <b>32.00</b> | -          |
| <b>3.00</b>             | <b>32.20</b> | -          |
| <b>3.00</b>             | <b>32.50</b> | -          |
| <b>3.00</b>             | <b>33.00</b> | -          |
| <b>3.00</b>             | <b>33.50</b> | -          |
| <b>3.00</b>             | <b>34.00</b> | -          |
| <b>3.00</b>             | <b>34.20</b> | -          |
| <b>3.00</b>             | <b>34.50</b> | -          |
| <b>3.00</b>             | <b>35.00</b> | -          |
| <b>3.00</b>             | <b>35.50</b> | -          |
| <b>3.00</b>             | <b>36.00</b> | -          |
| <b>3.00</b>             | <b>36.20</b> | -          |
| <b>3.00</b>             | <b>36.50</b> | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

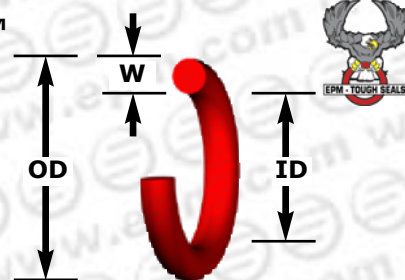
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>3.00</b>             | <b>37.00</b> | -          |
| 3.00                    | 37.20        | -          |
| <b>3.00</b>             | <b>37.50</b> | -          |
| <b>3.00</b>             | <b>38.00</b> | -          |
| <b>3.00</b>             | <b>38.50</b> | -          |
| <b>3.00</b>             | <b>39.00</b> | -          |
| <b>3.00</b>             | <b>39.20</b> | -          |
| <b>3.00</b>             | <b>39.50</b> | -          |
| <b>3.00</b>             | <b>40.00</b> | -          |
| 3.00                    | 40.20        | -          |
| <b>3.00</b>             | <b>41.00</b> | -          |
| <b>3.00</b>             | <b>41.50</b> | -          |
| <b>3.00</b>             | <b>42.00</b> | -          |
| <b>3.00</b>             | <b>42.20</b> | -          |
| <b>3.00</b>             | <b>42.50</b> | -          |
| <b>3.00</b>             | <b>43.00</b> | -          |
| <b>3.00</b>             | <b>44.00</b> | -          |
| <b>3.00</b>             | <b>44.20</b> | -          |
| <b>3.00</b>             | <b>44.50</b> | -          |
| <b>3.00</b>             | <b>45.00</b> | -          |
| <b>3.00</b>             | <b>46.00</b> | -          |
| <b>3.00</b>             | <b>47.00</b> | -          |
| <b>3.00</b>             | <b>48.00</b> | -          |
| <b>3.00</b>             | <b>49.00</b> | -          |
| <b>3.00</b>             | <b>49.50</b> | -          |
| <b>3.00</b>             | <b>50.00</b> | -          |
| <b>3.00</b>             | <b>50.50</b> | -          |
| <b>3.00</b>             | <b>51.00</b> | -          |
| <b>3.00</b>             | <b>52.00</b> | -          |
| <b>3.00</b>             | <b>53.00</b> | -          |
| <b>3.00</b>             | <b>54.00</b> | -          |
| 3.00                    | 54.20        | -          |
| <b>3.00</b>             | <b>54.50</b> | -          |
| <b>3.00</b>             | <b>55.00</b> | -          |
| <b>3.00</b>             | <b>56.00</b> | -          |
| 3.00                    | 56.20        | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>3.00</b>             | <b>57.00</b> | -          |
| <b>3.00</b>             | <b>58.00</b> | -          |
| <b>3.00</b>             | <b>59.00</b> | -          |
| <b>3.00</b>             | <b>59.50</b> | -          |
| <b>3.00</b>             | <b>60.00</b> | -          |
| <b>3.00</b>             | <b>61.00</b> | -          |
| <b>3.00</b>             | <b>62.00</b> | -          |
| 3.00                    | 62.20        | -          |
| <b>3.00</b>             | <b>63.00</b> | -          |
| <b>3.00</b>             | <b>64.00</b> | -          |
| <b>3.00</b>             | <b>64.50</b> | -          |
| <b>3.00</b>             | <b>65.00</b> | -          |
| <b>3.00</b>             | <b>66.00</b> | -          |
| <b>3.00</b>             | <b>67.00</b> | -          |
| <b>3.00</b>             | <b>68.00</b> | -          |
| <b>3.00</b>             | <b>69.00</b> | -          |
| <b>3.00</b>             | <b>69.50</b> | -          |
| <b>3.00</b>             | <b>70.00</b> | -          |
| <b>3.00</b>             | <b>71.00</b> | -          |
| <b>3.00</b>             | <b>72.00</b> | -          |
| <b>3.00</b>             | <b>73.00</b> | -          |
| <b>3.00</b>             | <b>74.00</b> | -          |
| <b>3.00</b>             | <b>74.50</b> | -          |
| <b>3.00</b>             | <b>75.00</b> | -          |
| <b>3.00</b>             | <b>76.00</b> | -          |
| <b>3.00</b>             | <b>77.00</b> | -          |
| <b>3.00</b>             | <b>78.00</b> | -          |
| <b>3.00</b>             | <b>79.00</b> | -          |
| <b>3.00</b>             | <b>79.50</b> | -          |
| <b>3.00</b>             | <b>80.00</b> | -          |
| <b>3.00</b>             | <b>81.00</b> | -          |
| <b>3.00</b>             | <b>82.00</b> | -          |
| <b>3.00</b>             | <b>83.00</b> | -          |
| <b>3.00</b>             | <b>84.00</b> | -          |
| <b>3.00</b>             | <b>84.50</b> | -          |
| <b>3.00</b>             | <b>85.00</b> | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| <b>3.00</b>             | <b>86.00</b>  | -          |
| <b>3.00</b>             | <b>87.00</b>  | -          |
| <b>3.00</b>             | <b>88.00</b>  | -          |
| <b>3.00</b>             | <b>89.00</b>  | -          |
| <b>3.00</b>             | <b>89.50</b>  | -          |
| <b>3.00</b>             | <b>90.00</b>  | -          |
| <b>3.00</b>             | <b>91.00</b>  | -          |
| <b>3.00</b>             | <b>92.00</b>  | -          |
| <b>3.00</b>             | <b>93.00</b>  | -          |
| <b>3.00</b>             | <b>94.00</b>  | -          |
| <b>3.00</b>             | <b>94.50</b>  | -          |
| <b>3.00</b>             | <b>95.00</b>  | -          |
| <b>3.00</b>             | <b>96.00</b>  | -          |
| <b>3.00</b>             | <b>97.00</b>  | -          |
| <b>3.00</b>             | <b>98.00</b>  | -          |
| <b>3.00</b>             | <b>99.00</b>  | -          |
| <b>3.00</b>             | <b>99.50</b>  | -          |
| <b>3.00</b>             | <b>100.00</b> | -          |
| <b>3.00</b>             | <b>101.00</b> | -          |
| <b>3.00</b>             | <b>102.00</b> | -          |
| <b>3.00</b>             | <b>103.00</b> | -          |
| <b>3.00</b>             | <b>104.00</b> | -          |
| <b>3.00</b>             | <b>104.50</b> | -          |
| <b>3.00</b>             | <b>105.00</b> | -          |
| <b>3.00</b>             | <b>106.00</b> | -          |
| <b>3.00</b>             | <b>107.00</b> | -          |
| <b>3.00</b>             | <b>108.00</b> | -          |
| <b>3.00</b>             | <b>109.00</b> | -          |
| <b>3.00</b>             | <b>109.50</b> | -          |
| <b>3.00</b>             | <b>110.00</b> | -          |
| 3.00                    | 111.00        | -          |
| 3.00                    | 112.00        | -          |
| 3.00                    | 113.00        | -          |
| 3.00                    | 114.00        | -          |
| <b>3.00</b>             | <b>114.50</b> | -          |
| <b>3.00</b>             | <b>115.00</b> | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

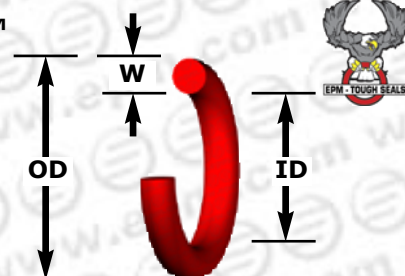
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 3.00                    | 116.00        | -          |
| 3.00                    | 117.00        | -          |
| <b>3.00</b>             | <b>118.00</b> | -          |
| 3.00                    | 119.00        | -          |
| <b>3.00</b>             | <b>119.50</b> | -          |
| <b>3.00</b>             | <b>120.00</b> | -          |
| 3.00                    | 121.00        | -          |
| <b>3.00</b>             | <b>122.00</b> | -          |
| <b>3.00</b>             | <b>123.00</b> | -          |
| <b>3.00</b>             | <b>124.00</b> | -          |
| <b>3.00</b>             | <b>124.50</b> | -          |
| 3.00                    | 125.00        | -          |
| 3.00                    | 126.00        | -          |
| 3.00                    | 126.50        | -          |
| <b>3.00</b>             | <b>127.00</b> | -          |
| <b>3.00</b>             | <b>128.00</b> | -          |
| 3.00                    | 129.00        | -          |
| <b>3.00</b>             | <b>129.50</b> | -          |
| <b>3.00</b>             | <b>130.00</b> | -          |
| 3.00                    | 131.00        | -          |
| <b>3.00</b>             | <b>132.00</b> | -          |
| 3.00                    | 133.00        | -          |
| 3.00                    | 134.00        | -          |
| <b>3.00</b>             | <b>134.50</b> | -          |
| <b>3.00</b>             | <b>135.00</b> | -          |
| <b>3.00</b>             | <b>136.00</b> | -          |
| <b>3.00</b>             | <b>137.00</b> | -          |
| 3.00                    | 138.00        | -          |
| 3.00                    | 139.00        | -          |
| 3.00                    | 139.50        | -          |
| <b>3.00</b>             | <b>140.00</b> | -          |
| 3.00                    | 141.00        | -          |
| 3.00                    | 142.00        | -          |
| 3.00                    | 143.00        | -          |
| 3.00                    | 144.00        | -          |
| 3.00                    | 144.50        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| <b>3.00</b>             | <b>145.00</b> | -          |
| <b>3.00</b>             | <b>146.00</b> | -          |
| 3.00                    | 147.00        | -          |
| 3.00                    | 148.00        | -          |
| <b>3.00</b>             | <b>149.00</b> | -          |
| <b>3.00</b>             | <b>149.50</b> | -          |
| <b>3.00</b>             | <b>150.00</b> | -          |
| 3.00                    | 151.00        | -          |
| 3.00                    | 152.00        | -          |
| 3.00                    | 153.00        | -          |
| 3.00                    | 154.00        | -          |
| 3.00                    | 154.50        | -          |
| <b>3.00</b>             | <b>155.00</b> | -          |
| <b>3.00</b>             | <b>156.00</b> | -          |
| 3.00                    | 157.00        | -          |
| 3.00                    | 158.00        | -          |
| 3.00                    | 159.00        | -          |
| 3.00                    | 159.50        | -          |
| <b>3.00</b>             | <b>160.00</b> | -          |
| 3.00                    | 161.00        | -          |
| 3.00                    | 162.00        | -          |
| 3.00                    | 163.00        | -          |
| <b>3.00</b>             | <b>164.00</b> | -          |
| 3.00                    | 164.50        | -          |
| 3.00                    | 165.00        | -          |
| 3.00                    | 166.00        | -          |
| 3.00                    | 167.00        | -          |
| <b>3.00</b>             | <b>168.00</b> | -          |
| 3.00                    | 169.00        | -          |
| <b>3.00</b>             | <b>169.50</b> | -          |
| <b>3.00</b>             | <b>170.00</b> | -          |
| <b>3.00</b>             | <b>171.00</b> | -          |
| 3.00                    | 172.00        | -          |
| 3.00                    | 173.00        | -          |
| <b>3.00</b>             | <b>174.00</b> | -          |
| 3.00                    | 174.50        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 3.00                    | 175.00        | -          |
| <b>3.00</b>             | <b>176.00</b> | -          |
| <b>3.00</b>             | <b>177.00</b> | -          |
| 3.00                    | 178.00        | -          |
| <b>3.00</b>             | <b>179.00</b> | -          |
| 3.00                    | 179.50        | -          |
| <b>3.00</b>             | <b>180.00</b> | -          |
| 3.00                    | 181.00        | -          |
| 3.00                    | 182.00        | -          |
| 3.00                    | 183.00        | -          |
| 3.00                    | 183.50        | -          |
| 3.00                    | 184.00        | -          |
| 3.00                    | 184.50        | -          |
| 3.00                    | 185.00        | -          |
| 3.00                    | 186.00        | -          |
| 3.00                    | 187.00        | -          |
| 3.00                    | 188.00        | -          |
| <b>3.00</b>             | <b>189.00</b> | -          |
| <b>3.00</b>             | <b>189.50</b> | -          |
| 3.00                    | 190.00        | -          |
| 3.00                    | 191.00        | -          |
| 3.00                    | 192.00        | -          |
| 3.00                    | 193.00        | -          |
| <b>3.00</b>             | <b>194.00</b> | -          |
| 3.00                    | 194.50        | -          |
| 3.00                    | 195.00        | -          |
| 3.00                    | 196.00        | -          |
| 3.00                    | 197.00        | -          |
| 3.00                    | 198.00        | -          |
| 3.00                    | 199.00        | -          |
| 3.00                    | 199.50        | -          |
| 3.00                    | 200.00        | -          |
| 3.00                    | 201.00        | -          |
| 3.00                    | 202.00        | -          |
| 3.00                    | 203.00        | -          |
| 3.00                    | 204.00        | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

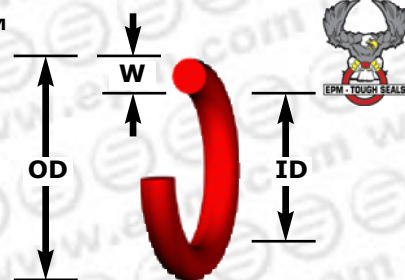
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 3.00                    | 204.50        | -          |
| <b>3.00</b>             | <b>205.00</b> | -          |
| 3.00                    | 206.00        | -          |
| 3.00                    | 207.00        | -          |
| 3.00                    | 208.00        | -          |
| <b>3.00</b>             | <b>209.00</b> | -          |
| 3.00                    | 209.50        | -          |
| 3.00                    | 210.00        | -          |
| 3.00                    | 211.00        | -          |
| 3.00                    | 212.00        | -          |
| 3.00                    | 213.00        | -          |
| 3.00                    | 214.00        | -          |
| 3.00                    | 215.00        | -          |
| 3.00                    | 216.00        | -          |
| 3.00                    | 217.00        | -          |
| 3.00                    | 218.00        | -          |
| 3.00                    | 219.00        | -          |
| 3.00                    | 219.50        | -          |
| 3.00                    | 220.00        | -          |
| 3.00                    | 221.00        | -          |
| 3.00                    | 222.00        | -          |
| 3.00                    | 223.00        | -          |
| 3.00                    | 224.00        | -          |
| <b>3.00</b>             | <b>225.00</b> | -          |
| 3.00                    | 226.00        | -          |
| 3.00                    | 227.00        | -          |
| 3.00                    | 228.00        | -          |
| 3.00                    | 229.00        | -          |
| 3.00                    | 229.50        | -          |
| 3.00                    | 230.00        | -          |
| 3.00                    | 231.00        | -          |
| 3.00                    | 232.00        | -          |
| 3.00                    | 233.00        | -          |
| 3.00                    | 234.00        | -          |
| 3.00                    | 235.00        | -          |
| 3.00                    | 236.00        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| <b>3.00</b>             | <b>237.00</b> | -          |
| 3.00                    | 238.00        | -          |
| 3.00                    | 239.00        | -          |
| 3.00                    | 239.50        | -          |
| 3.00                    | 240.00        | -          |
| 3.00                    | 241.00        | -          |
| 3.00                    | 242.00        | -          |
| 3.00                    | 243.00        | -          |
| 3.00                    | 244.00        | -          |
| 3.00                    | 245.00        | -          |
| 3.00                    | 246.00        | -          |
| 3.00                    | 247.00        | -          |
| 3.00                    | 248.00        | -          |
| 3.00                    | 249.00        | -          |
| 3.00                    | 249.50        | -          |
| <b>3.00</b>             | <b>250.00</b> | -          |
| 3.00                    | 255.00        | -          |
| 3.00                    | 259.30        | -          |
| 3.00                    | 260.00        | -          |
| 3.00                    | 264.00        | -          |
| 3.00                    | 270.00        | -          |
| 3.00                    | 280.00        | -          |
| 3.00                    | 300.00        | -          |
| 3.00                    | 315.00        | -          |
| 3.00                    | 320.00        | -          |
| 3.00                    | 350.00        | -          |
| 3.00                    | 440.00        | -          |
| 3.00                    | 505.00        | -          |
| 3.00                    | 518.50        | -          |
| <b>3.10</b>             | <b>24.20</b>  | G25        |
| <b>3.10</b>             | <b>29.40</b>  | G30        |
| <b>3.10</b>             | <b>34.40</b>  | G35        |
| <b>3.10</b>             | <b>39.40</b>  | G40        |
| <b>3.10</b>             | <b>44.40</b>  | G45        |
| <b>3.10</b>             | <b>49.40</b>  | G50        |
| <b>3.10</b>             | <b>54.40</b>  | G55        |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| <b>3.10</b>             | <b>59.40</b>  | G60        |
| <b>3.10</b>             | <b>64.40</b>  | G65        |
| <b>3.10</b>             | <b>69.40</b>  | G70        |
| <b>3.10</b>             | <b>74.40</b>  | G75        |
| <b>3.10</b>             | <b>79.40</b>  | G80        |
| <b>3.10</b>             | <b>84.40</b>  | G85        |
| <b>3.10</b>             | <b>89.40</b>  | G90        |
| <b>3.10</b>             | <b>94.40</b>  | G95        |
| <b>3.10</b>             | <b>99.40</b>  | G100       |
| <b>3.10</b>             | <b>104.40</b> | G105       |
| <b>3.10</b>             | <b>109.40</b> | G110       |
| <b>3.10</b>             | <b>114.40</b> | G115       |
| <b>3.10</b>             | <b>119.40</b> | G120       |
| <b>3.10</b>             | <b>124.40</b> | G125       |
| <b>3.10</b>             | <b>129.40</b> | G130       |
| <b>3.10</b>             | <b>134.40</b> | G135       |
| <b>3.10</b>             | <b>139.40</b> | G140       |
| <b>3.10</b>             | <b>144.40</b> | G145       |
| 3.20                    | 174.00        | -          |
| 3.20                    | 219.50        | -          |
| 3.20                    | 227.00        | -          |
| 3.50                    | 5.00          | -          |
| <b>3.50</b>             | <b>8.00</b>   | -          |
| <b>3.50</b>             | <b>9.00</b>   | -          |
| 3.50                    | 9.20          | -          |
| 3.50                    | 10.00         | -          |
| <b>3.50</b>             | <b>11.00</b>  | -          |
| 3.50                    | 12.00         | -          |
| <b>3.50</b>             | <b>13.00</b>  | -          |
| <b>3.50</b>             | <b>14.00</b>  | -          |
| <b>3.50</b>             | <b>15.00</b>  | -          |
| <b>3.50</b>             | <b>16.00</b>  | -          |
| 3.50                    | 17.00         | -          |
| 3.50                    | 17.50         | -          |
| <b>3.50</b>             | <b>18.00</b>  | -          |
| <b>3.50</b>             | <b>19.00</b>  | -          |



**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

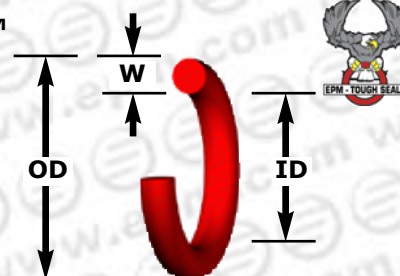
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

## METRIC

### SIZING CHART (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 3.50                    | 20.00     | -          |
| 3.50                    | 21.00     | -          |
| 3.50                    | 21.70     | P22A       |
| 3.50                    | 22.00     | -          |
| 3.50                    | 22.10     | P22.4      |
| 3.50                    | 23.00     | -          |
| 3.50                    | 23.70     | P24        |
| 3.50                    | 24.00     | -          |
| 3.50                    | 24.70     | P25        |
| 3.50                    | 25.00     | -          |
| 3.50                    | 25.20     | P25.5      |
| 3.50                    | 25.70     | P26        |
| 3.50                    | 26.00     | -          |
| 3.50                    | 27.00     | -          |
| 3.50                    | 27.70     | P28        |
| 3.50                    | 28.00     | -          |
| 3.50                    | 28.70     | P29        |
| 3.50                    | 29.00     | -          |
| 3.50                    | 29.20     | P29.5      |
| 3.50                    | 29.70     | P30        |
| 3.50                    | 30.00     | -          |
| 3.50                    | 30.50     | -          |
| 3.50                    | 30.70     | P31        |
| 3.50                    | 31.00     | -          |
| 3.50                    | 31.20     | P31.5      |
| 3.50                    | 31.70     | P32        |
| 3.50                    | 32.00     | -          |
| 3.50                    | 33.00     | -          |
| 3.50                    | 33.70     | P34        |
| 3.50                    | 34.00     | -          |
| 3.50                    | 34.70     | P35        |
| 3.50                    | 35.00     | -          |
| 3.50                    | 35.20     | P35.5      |
| 3.50                    | 35.70     | P36        |
| 3.50                    | 36.00     | -          |
| 3.50                    | 37.00     | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 3.50                    | 37.70     | P38        |
| 3.50                    | 38.00     | -          |
| 3.50                    | 38.70     | P39        |
| 3.50                    | 39.00     | -          |
| 3.50                    | 39.70     | P40        |
| 3.50                    | 40.00     | -          |
| 3.50                    | 40.70     | P41        |
| 3.50                    | 41.00     | -          |
| 3.50                    | 41.70     | P42        |
| 3.50                    | 42.00     | -          |
| 3.50                    | 43.00     | -          |
| 3.50                    | 43.70     | P44        |
| 3.50                    | 44.00     | -          |
| 3.50                    | 44.70     | P45        |
| 3.50                    | 45.00     | -          |
| 3.50                    | 45.70     | P46        |
| 3.50                    | 46.00     | -          |
| 3.50                    | 47.00     | -          |
| 3.50                    | 47.70     | P48        |
| 3.50                    | 48.00     | -          |
| 3.50                    | 48.70     | P49        |
| 3.50                    | 49.00     | -          |
| 3.50                    | 49.70     | P50        |
| 3.50                    | 50.00     | -          |
| 3.50                    | 51.00     | -          |
| 3.50                    | 52.00     | -          |
| 3.50                    | 53.00     | -          |
| 3.50                    | 54.00     | -          |
| 3.50                    | 55.00     | -          |
| 3.50                    | 56.00     | -          |
| 3.50                    | 57.00     | -          |
| 3.50                    | 58.00     | -          |
| 3.50                    | 59.00     | -          |
| 3.50                    | 60.00     | -          |
| 3.50                    | 61.00     | -          |
| 3.50                    | 62.00     | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 3.50                    | 63.00     | -          |
| 3.50                    | 64.00     | -          |
| 3.50                    | 65.00     | -          |
| 3.50                    | 66.00     | -          |
| 3.50                    | 67.00     | -          |
| 3.50                    | 68.00     | -          |
| 3.50                    | 69.00     | -          |
| 3.50                    | 70.00     | -          |
| 3.50                    | 71.00     | -          |
| 3.50                    | 72.00     | -          |
| 3.50                    | 73.00     | -          |
| 3.50                    | 74.00     | -          |
| 3.50                    | 75.00     | -          |
| 3.50                    | 76.00     | -          |
| 3.50                    | 77.00     | -          |
| 3.50                    | 78.00     | -          |
| 3.50                    | 79.00     | -          |
| 3.50                    | 80.00     | -          |
| 3.50                    | 81.00     | -          |
| 3.50                    | 82.00     | -          |
| 3.50                    | 83.00     | -          |
| 3.50                    | 84.00     | -          |
| 3.50                    | 85.00     | -          |
| 3.50                    | 86.00     | -          |
| 3.50                    | 87.00     | -          |
| 3.50                    | 88.00     | -          |
| 3.50                    | 89.00     | -          |
| 3.50                    | 90.00     | -          |
| 3.50                    | 91.00     | -          |
| 3.50                    | 92.00     | -          |
| 3.50                    | 93.00     | -          |
| 3.50                    | 94.00     | -          |
| 3.50                    | 95.00     | -          |
| 3.50                    | 96.00     | -          |
| 3.50                    | 97.00     | -          |
| 3.50                    | 98.00     | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

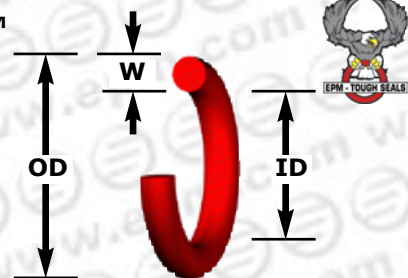
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 3.50                    | 99.00         | -          |
| 3.50                    | 100.00        | -          |
| 3.50                    | 101.00        | -          |
| 3.50                    | 102.00        | -          |
| 3.50                    | 103.00        | -          |
| 3.50                    | 104.00        | -          |
| <b>3.50</b>             | <b>105.00</b> | -          |
| 3.50                    | 106.00        | -          |
| 3.50                    | 107.00        | -          |
| 3.50                    | 108.00        | -          |
| 3.50                    | 109.00        | -          |
| 3.50                    | 110.00        | -          |
| 3.50                    | 111.00        | -          |
| <b>3.50</b>             | <b>112.00</b> | -          |
| 3.50                    | 113.00        | -          |
| 3.50                    | 114.00        | -          |
| 3.50                    | 115.00        | -          |
| 3.50                    | 116.00        | -          |
| 3.50                    | 117.00        | -          |
| <b>3.50</b>             | <b>118.00</b> | -          |
| 3.50                    | 119.00        | -          |
| <b>3.50</b>             | <b>120.00</b> | -          |
| 3.50                    | 121.00        | -          |
| 3.50                    | 122.00        | -          |
| 3.50                    | 123.00        | -          |
| 3.50                    | 124.00        | -          |
| 3.50                    | 125.00        | -          |
| 3.50                    | 126.00        | -          |
| 3.50                    | 127.00        | -          |
| 3.50                    | 128.00        | -          |
| <b>3.50</b>             | <b>129.00</b> | -          |
| 3.50                    | 130.00        | -          |
| 3.50                    | 131.00        | -          |
| <b>3.50</b>             | <b>132.00</b> | -          |
| 3.50                    | 133.00        | -          |
| 3.50                    | 134.00        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 3.50                    | 135.00        | -          |
| 3.50                    | 136.00        | -          |
| 3.50                    | 137.00        | -          |
| 3.50                    | 138.00        | -          |
| 3.50                    | 139.00        | -          |
| 3.50                    | 140.00        | -          |
| 3.50                    | 141.00        | -          |
| 3.50                    | 142.00        | -          |
| 3.50                    | 143.00        | -          |
| 3.50                    | 144.00        | -          |
| <b>3.50</b>             | <b>145.00</b> | -          |
| 3.50                    | 146.00        | -          |
| <b>3.50</b>             | <b>147.00</b> | -          |
| 3.50                    | 148.00        | -          |
| 3.50                    | 149.00        | -          |
| 3.50                    | 150.00        | -          |
| 3.50                    | 151.00        | -          |
| 3.50                    | 152.00        | -          |
| <b>3.50</b>             | <b>153.00</b> | -          |
| 3.50                    | 154.00        | -          |
| 3.50                    | 155.00        | -          |
| 3.50                    | 156.00        | -          |
| 3.50                    | 157.00        | -          |
| 3.50                    | 158.00        | -          |
| 3.50                    | 159.00        | -          |
| 3.50                    | 160.00        | -          |
| 3.50                    | 161.00        | -          |
| 3.50                    | 162.00        | -          |
| 3.50                    | 163.00        | -          |
| 3.50                    | 164.00        | -          |
| 3.50                    | 165.00        | -          |
| 3.50                    | 166.00        | -          |
| 3.50                    | 167.00        | -          |
| <b>3.50</b>             | <b>168.00</b> | -          |
| 3.50                    | 169.00        | -          |
| <b>3.50</b>             | <b>170.00</b> | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 3.50                    | 171.00        | -          |
| 3.50                    | 172.00        | -          |
| 3.50                    | 173.00        | -          |
| 3.50                    | 174.00        | -          |
| <b>3.50</b>             | <b>175.00</b> | -          |
| 3.50                    | 176.00        | -          |
| 3.50                    | 177.00        | -          |
| 3.50                    | 178.00        | -          |
| 3.50                    | 179.00        | -          |
| <b>3.50</b>             | <b>180.00</b> | -          |
| 3.50                    | 181.00        | -          |
| 3.50                    | 182.00        | -          |
| 3.50                    | 183.00        | -          |
| 3.50                    | 184.00        | -          |
| 3.50                    | 185.00        | -          |
| 3.50                    | 186.00        | -          |
| 3.50                    | 187.00        | -          |
| 3.50                    | 188.00        | -          |
| 3.50                    | 189.00        | -          |
| 3.50                    | 190.00        | -          |
| 3.50                    | 191.00        | -          |
| 3.50                    | 192.00        | -          |
| <b>3.50</b>             | <b>193.00</b> | -          |
| 3.50                    | 194.00        | -          |
| 3.50                    | 195.00        | -          |
| 3.50                    | 196.00        | -          |
| 3.50                    | 197.00        | -          |
| 3.50                    | 198.00        | -          |
| 3.50                    | 199.00        | -          |
| <b>3.50</b>             | <b>200.00</b> | -          |
| 3.50                    | 201.00        | -          |
| <b>3.50</b>             | <b>202.00</b> | -          |
| 3.50                    | 203.00        | -          |
| 3.50                    | 204.00        | -          |
| 3.50                    | 205.00        | -          |
| 3.50                    | 206.00        | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

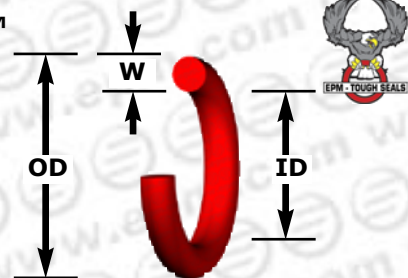
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 3.50                    | 207.00        | -          |
| 3.50                    | 208.00        | -          |
| 3.50                    | 209.00        | -          |
| <b>3.50</b>             | <b>210.00</b> | -          |
| <b>3.50</b>             | <b>211.00</b> | -          |
| 3.50                    | 212.00        | -          |
| 3.50                    | 213.00        | -          |
| 3.50                    | 214.00        | -          |
| 3.50                    | 215.00        | -          |
| 3.50                    | 216.00        | -          |
| 3.50                    | 217.00        | -          |
| 3.50                    | 218.00        | -          |
| 3.50                    | 219.00        | -          |
| 3.50                    | 220.00        | -          |
| 3.50                    | 221.00        | -          |
| 3.50                    | 222.00        | -          |
| 3.50                    | 223.00        | -          |
| 3.50                    | 224.00        | -          |
| 3.50                    | 225.00        | -          |
| 3.50                    | 226.00        | -          |
| 3.50                    | 227.00        | -          |
| 3.50                    | 228.00        | -          |
| 3.50                    | 229.00        | -          |
| 3.50                    | 230.00        | -          |
| 3.50                    | 231.00        | -          |
| 3.50                    | 232.00        | -          |
| 3.50                    | 233.00        | -          |
| 3.50                    | 234.00        | -          |
| 3.50                    | 235.00        | -          |
| 3.50                    | 236.00        | -          |
| 3.50                    | 237.00        | -          |
| 3.50                    | 238.00        | -          |
| 3.50                    | 239.00        | -          |
| 3.50                    | 240.00        | -          |
| 3.50                    | 241.00        | -          |
| 3.50                    | 242.00        | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 3.50                    | 243.00    | -          |
| 3.50                    | 244.00    | -          |
| 3.50                    | 245.00    | -          |
| 3.50                    | 246.00    | -          |
| 3.50                    | 247.00    | -          |
| 3.50                    | 248.00    | -          |
| 3.50                    | 249.00    | -          |
| 3.50                    | 250.00    | -          |
| 3.50                    | 251.00    | -          |
| 3.50                    | 252.00    | -          |
| 3.50                    | 253.00    | -          |
| 3.50                    | 254.00    | -          |
| 3.50                    | 255.00    | -          |
| 3.50                    | 256.00    | -          |
| 3.50                    | 257.00    | -          |
| 3.50                    | 258.00    | -          |
| 3.50                    | 259.00    | -          |
| 3.50                    | 260.00    | -          |
| 3.50                    | 261.00    | -          |
| 3.50                    | 262.00    | -          |
| 3.50                    | 263.00    | -          |
| 3.50                    | 264.00    | -          |
| 3.50                    | 265.00    | -          |
| 3.50                    | 266.00    | -          |
| 3.50                    | 267.00    | -          |
| 3.50                    | 268.00    | -          |
| 3.50                    | 269.00    | -          |
| 3.50                    | 270.00    | -          |
| 3.50                    | 271.00    | -          |
| 3.50                    | 272.00    | -          |
| 3.50                    | 273.00    | -          |
| 3.50                    | 274.00    | -          |
| 3.50                    | 275.00    | -          |
| 3.50                    | 276.00    | -          |
| 3.50                    | 277.00    | -          |
| 3.50                    | 278.00    | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 3.50                    | 279.00        | -          |
| 3.50                    | 280.00        | -          |
| 3.50                    | 281.00        | -          |
| <b>3.50</b>             | <b>282.00</b> | -          |
| 3.50                    | 283.00        | -          |
| 3.50                    | 284.00        | -          |
| 3.50                    | 285.00        | -          |
| 3.50                    | 286.00        | -          |
| 3.50                    | 287.00        | -          |
| 3.50                    | 288.00        | -          |
| 3.50                    | 289.00        | -          |
| 3.50                    | 290.00        | -          |
| 3.50                    | 291.00        | -          |
| 3.50                    | 292.00        | -          |
| 3.50                    | 293.00        | -          |
| 3.50                    | 294.00        | -          |
| 3.50                    | 295.00        | -          |
| 3.50                    | 296.00        | -          |
| 3.50                    | 297.00        | -          |
| 3.50                    | 298.00        | -          |
| 3.50                    | 299.00        | -          |
| 3.50                    | 300.00        | -          |
| 3.50                    | 301.00        | -          |
| 3.50                    | 302.00        | -          |
| 3.50                    | 303.00        | -          |
| 3.50                    | 304.00        | -          |
| 3.50                    | 305.00        | -          |
| 3.50                    | 306.00        | -          |
| 3.50                    | 307.00        | -          |
| 3.50                    | 308.00        | -          |
| 3.50                    | 309.00        | -          |
| 3.50                    | 310.00        | -          |
| 3.50                    | 311.00        | -          |
| 3.50                    | 312.00        | -          |
| 3.50                    | 313.00        | -          |
| 3.50                    | 314.00        | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

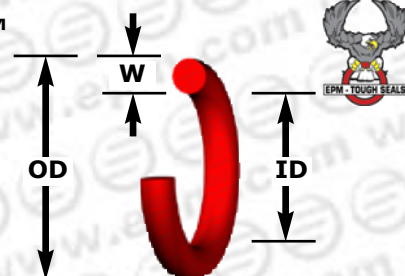
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 3.50                    | 315.00    | -          |
| 3.50                    | 316.00    | -          |
| 3.50                    | 317.00    | -          |
| 3.50                    | 318.00    | -          |
| 3.50                    | 319.00    | -          |
| 3.50                    | 320.00    | -          |
| 3.50                    | 321.00    | -          |
| 3.50                    | 322.00    | -          |
| 3.50                    | 323.00    | -          |
| 3.50                    | 324.00    | -          |
| 3.50                    | 325.00    | -          |
| 3.50                    | 326.00    | -          |
| 3.50                    | 327.00    | -          |
| 3.50                    | 328.00    | -          |
| 3.50                    | 329.00    | -          |
| 3.50                    | 330.00    | -          |
| 3.50                    | 331.00    | -          |
| 3.50                    | 332.00    | -          |
| 3.50                    | 333.00    | -          |
| 3.50                    | 334.00    | -          |
| 3.50                    | 335.00    | -          |
| 3.50                    | 336.00    | -          |
| 3.50                    | 337.00    | -          |
| 3.50                    | 338.00    | -          |
| 3.50                    | 339.00    | -          |
| 3.50                    | 340.00    | -          |
| 3.50                    | 341.00    | -          |
| 3.50                    | 342.00    | -          |
| 3.50                    | 343.00    | -          |
| 3.50                    | 344.00    | -          |
| 3.50                    | 345.00    | -          |
| 3.50                    | 346.00    | -          |
| 3.50                    | 347.00    | -          |
| 3.50                    | 348.00    | -          |
| 3.50                    | 349.00    | -          |
| 3.50                    | 350.00    | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 3.50                    | 351.00    | -          |
| 3.50                    | 352.00    | -          |
| 3.50                    | 353.00    | -          |
| 3.50                    | 354.00    | -          |
| 3.50                    | 355.00    | -          |
| 3.50                    | 356.00    | -          |
| 3.50                    | 357.00    | -          |
| 3.50                    | 358.00    | -          |
| 3.50                    | 359.00    | -          |
| 3.50                    | 360.00    | -          |
| 3.50                    | 361.00    | -          |
| 3.50                    | 362.00    | -          |
| 3.50                    | 363.00    | -          |
| 3.50                    | 364.00    | -          |
| 3.50                    | 365.00    | -          |
| 3.50                    | 366.00    | -          |
| 3.50                    | 367.00    | -          |
| 3.50                    | 368.00    | -          |
| 3.50                    | 369.00    | -          |
| 3.50                    | 370.00    | -          |
| 3.50                    | 371.00    | -          |
| 3.50                    | 372.00    | -          |
| 3.50                    | 373.00    | -          |
| 3.50                    | 374.00    | -          |
| 3.50                    | 375.00    | -          |
| 3.50                    | 376.00    | -          |
| 3.50                    | 377.00    | -          |
| 3.50                    | 378.00    | -          |
| 3.50                    | 379.00    | -          |
| 3.50                    | 380.00    | -          |
| 3.50                    | 381.00    | -          |
| 3.50                    | 382.00    | -          |
| 3.50                    | 383.00    | -          |
| 3.50                    | 384.00    | -          |
| 3.50                    | 385.00    | -          |
| 3.50                    | 386.00    | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 3.50                    | 387.00    | -          |
| 3.50                    | 388.00    | -          |
| 3.50                    | 389.00    | -          |
| 3.50                    | 390.00    | -          |
| 3.50                    | 391.00    | -          |
| 3.50                    | 392.00    | -          |
| 3.50                    | 393.00    | -          |
| 3.50                    | 394.00    | -          |
| 3.50                    | 395.00    | -          |
| 3.50                    | 396.00    | -          |
| 3.50                    | 397.00    | -          |
| 3.50                    | 398.00    | -          |
| 3.50                    | 399.00    | -          |
| 3.50                    | 400.00    | -          |
| 3.50                    | 401.00    | -          |
| 3.50                    | 402.00    | -          |
| 3.50                    | 403.00    | -          |
| 3.50                    | 404.00    | -          |
| 3.50                    | 405.00    | -          |
| 3.50                    | 406.00    | -          |
| 3.50                    | 407.00    | -          |
| 3.50                    | 408.00    | -          |
| 3.50                    | 409.00    | -          |
| 3.50                    | 410.00    | -          |
| 3.50                    | 411.00    | -          |
| 3.50                    | 412.00    | -          |
| 3.50                    | 413.00    | -          |
| 3.50                    | 414.00    | -          |
| 3.50                    | 415.00    | -          |
| 3.50                    | 416.00    | -          |
| 3.50                    | 417.00    | -          |
| 3.50                    | 418.00    | -          |
| 3.50                    | 419.00    | -          |
| 3.50                    | 420.00    | -          |
| 3.50                    | 421.00    | -          |
| 3.50                    | 422.00    | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

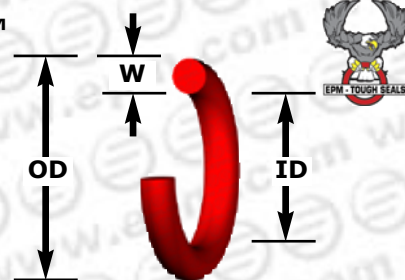
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 3.50                    | 423.00    | -          |
| 3.50                    | 424.00    | -          |
| 3.50                    | 425.00    | -          |
| 3.50                    | 426.00    | -          |
| 3.50                    | 427.00    | -          |
| 3.50                    | 428.00    | -          |
| 3.50                    | 429.00    | -          |
| 3.50                    | 430.00    | -          |
| 3.50                    | 431.00    | -          |
| 3.50                    | 432.00    | -          |
| 3.50                    | 433.00    | -          |
| 3.50                    | 434.00    | -          |
| 3.50                    | 435.00    | -          |
| 3.50                    | 436.00    | -          |
| 3.50                    | 437.00    | -          |
| 3.50                    | 438.00    | -          |
| 3.50                    | 439.00    | -          |
| 3.50                    | 440.00    | -          |
| 3.53                    | 25.80     | BS618      |
| 3.53                    | 39.70     | BS824      |
| 3.53                    | 41.28     | BS825      |
| 3.53                    | 42.86     | BS826      |
| 3.53                    | 44.45     | BS827      |
| 3.53                    | 46.04     | BS828      |
| 3.53                    | 47.62     | BS829      |
| 3.53                    | 49.20     | BS830      |
| 3.53                    | 50.80     | BS831      |
| 3.53                    | 52.40     | BS832      |
| 3.53                    | 53.97     | BS833      |
| 3.53                    | 55.56     | BS834      |
| 3.53                    | 57.15     | BS835      |
| 3.53                    | 58.74     | BS836      |
| 3.53                    | 60.32     | BS837      |
| 3.53                    | 61.90     | BS838      |
| 3.53                    | 63.50     | BS839      |
| 3.53                    | 65.10     | BS840      |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| 3.53                    | 66.67        | BS841      |
| 3.53                    | 68.26        | BS842      |
| 3.53                    | 69.85        | BS843      |
| 3.53                    | 71.44        | BS844      |
| 3.53                    | 73.02        | BS845      |
| 3.53                    | 74.60        | BS846      |
| 3.53                    | 158.82       | -          |
| 3.53                    | 319.20       | -          |
| <b>3.55</b>             | <b>18.00</b> | -          |
| 3.55                    | 19.00        | -          |
| 3.55                    | 20.00        | -          |
| 3.55                    | 21.20        | -          |
| 3.55                    | 22.40        | -          |
| 3.55                    | 23.60        | -          |
| <b>3.55</b>             | <b>25.00</b> | -          |
| 3.55                    | 25.80        | -          |
| 3.55                    | 26.50        | -          |
| 3.55                    | 28.00        | -          |
| <b>3.55</b>             | <b>30.00</b> | -          |
| 3.55                    | 31.50        | -          |
| 3.55                    | 32.50        | -          |
| 3.55                    | 33.50        | -          |
| <b>3.55</b>             | <b>34.50</b> | -          |
| 3.55                    | 35.50        | -          |
| 3.55                    | 36.50        | -          |
| 3.55                    | 37.50        | -          |
| 3.55                    | 38.70        | -          |
| <b>3.55</b>             | <b>40.00</b> | -          |
| 3.55                    | 41.20        | -          |
| 3.55                    | 42.50        | -          |
| 3.55                    | 43.70        | -          |
| <b>3.55</b>             | <b>45.00</b> | -          |
| 3.55                    | 46.20        | -          |
| 3.55                    | 47.50        | -          |
| 3.55                    | 48.70        | -          |
| 3.55                    | 50.00        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 3.55                    | 51.50         | -          |
| <b>3.55</b>             | <b>53.00</b>  | -          |
| 3.55                    | 54.50         | -          |
| 3.55                    | 56.00         | -          |
| 3.55                    | 58.00         | -          |
| <b>3.55</b>             | <b>60.00</b>  | -          |
| 3.55                    | 61.50         | -          |
| 3.55                    | 63.00         | -          |
| 3.55                    | 65.00         | -          |
| 3.55                    | 67.00         | -          |
| 3.55                    | 69.00         | -          |
| 3.55                    | 71.00         | -          |
| 3.55                    | 73.00         | -          |
| <b>3.55</b>             | <b>75.00</b>  | -          |
| 3.55                    | 77.50         | -          |
| 3.55                    | 80.00         | -          |
| 3.55                    | 82.50         | -          |
| <b>3.55</b>             | <b>85.00</b>  | -          |
| 3.55                    | 87.50         | -          |
| 3.55                    | 90.00         | -          |
| 3.55                    | 92.50         | -          |
| <b>3.55</b>             | <b>95.00</b>  | -          |
| 3.55                    | 97.50         | -          |
| 3.55                    | 100.00        | -          |
| 3.55                    | 103.00        | -          |
| <b>3.55</b>             | <b>106.00</b> | -          |
| 3.55                    | 109.00        | -          |
| 3.55                    | 112.00        | -          |
| 3.55                    | 115.00        | -          |
| <b>3.55</b>             | <b>118.00</b> | -          |
| 3.55                    | 122.00        | -          |
| 3.55                    | 125.00        | -          |
| 3.55                    | 128.00        | -          |
| 3.55                    | 132.00        | -          |
| 3.55                    | 136.00        | -          |
| <b>3.55</b>             | <b>140.00</b> | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

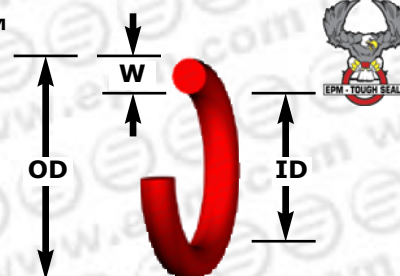
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 3.55                    | 145.00        | -          |
| 3.55                    | 150.00        | -          |
| 3.55                    | 155.00        | -          |
| 3.55                    | 160.00        | -          |
| 3.55                    | 165.00        | -          |
| <b>3.55</b>             | <b>170.00</b> | -          |
| 3.55                    | 175.00        | -          |
| 3.55                    | 180.00        | -          |
| 3.55                    | 185.00        | -          |
| 3.55                    | 190.00        | -          |
| 3.55                    | 195.00        | -          |
| 3.55                    | 200.00        | -          |
| 3.60                    | 18.30         | -          |
| 3.60                    | 19.80         | -          |
| 3.60                    | 21.30         | -          |
| 3.60                    | 23.00         | -          |
| 3.60                    | 24.60         | -          |
| 3.60                    | 26.20         | -          |
| 3.60                    | 27.80         | -          |
| 3.60                    | 29.30         | -          |
| 3.60                    | 30.80         | -          |
| 3.60                    | 32.50         | -          |
| 3.60                    | 34.10         | -          |
| 3.60                    | 35.60         | -          |
| 3.60                    | 37.30         | -          |
| 3.60                    | 43.40         | -          |
| 4.00                    | 4.00          | -          |
| 4.00                    | 5.00          | -          |
| <b>4.00</b>             | <b>6.00</b>   | -          |
| 4.00                    | 7.00          | -          |
| 4.00                    | 7.60          | -          |
| 4.00                    | 8.00          | -          |
| <b>4.00</b>             | <b>9.00</b>   | -          |
| <b>4.00</b>             | <b>10.00</b>  | -          |
| <b>4.00</b>             | <b>11.00</b>  | -          |
| <b>4.00</b>             | <b>12.00</b>  | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| 4.00                    | 13.00        | -          |
| <b>4.00</b>             | <b>14.00</b> | -          |
| <b>4.00</b>             | <b>14.50</b> | V15        |
| <b>4.00</b>             | <b>15.00</b> | -          |
| <b>4.00</b>             | <b>16.00</b> | -          |
| <b>4.00</b>             | <b>17.00</b> | -          |
| <b>4.00</b>             | <b>18.00</b> | -          |
| <b>4.00</b>             | <b>19.00</b> | -          |
| <b>4.00</b>             | <b>20.00</b> | -          |
| <b>4.00</b>             | <b>21.00</b> | -          |
| <b>4.00</b>             | <b>22.00</b> | -          |
| <b>4.00</b>             | <b>23.00</b> | -          |
| <b>4.00</b>             | <b>23.50</b> | V24        |
| <b>4.00</b>             | <b>24.00</b> | -          |
| <b>4.00</b>             | <b>25.00</b> | -          |
| <b>4.00</b>             | <b>26.00</b> | -          |
| <b>4.00</b>             | <b>27.00</b> | -          |
| <b>4.00</b>             | <b>28.00</b> | -          |
| <b>4.00</b>             | <b>29.00</b> | -          |
| <b>4.00</b>             | <b>30.00</b> | -          |
| <b>4.00</b>             | <b>31.00</b> | -          |
| <b>4.00</b>             | <b>32.00</b> | -          |
| <b>4.00</b>             | <b>33.00</b> | -          |
| <b>4.00</b>             | <b>33.50</b> | V34        |
| <b>4.00</b>             | <b>34.00</b> | -          |
| <b>4.00</b>             | <b>35.00</b> | -          |
| 4.00                    | 36.00        | -          |
| <b>4.00</b>             | <b>37.00</b> | -          |
| <b>4.00</b>             | <b>38.00</b> | -          |
| <b>4.00</b>             | <b>39.00</b> | -          |
| <b>4.00</b>             | <b>39.50</b> | V40        |
| <b>4.00</b>             | <b>40.00</b> | -          |
| <b>4.00</b>             | <b>41.00</b> | -          |
| <b>4.00</b>             | <b>42.00</b> | -          |
| <b>4.00</b>             | <b>43.00</b> | -          |
| <b>4.00</b>             | <b>44.00</b> | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>4.00</b>             | <b>45.00</b> | -          |
| <b>4.00</b>             | <b>46.00</b> | -          |
| <b>4.00</b>             | <b>47.00</b> | -          |
| <b>4.00</b>             | <b>48.00</b> | -          |
| <b>4.00</b>             | <b>49.00</b> | -          |
| <b>4.00</b>             | <b>50.00</b> | -          |
| <b>4.00</b>             | <b>51.00</b> | -          |
| <b>4.00</b>             | <b>52.00</b> | -          |
| <b>4.00</b>             | <b>53.00</b> | -          |
| <b>4.00</b>             | <b>54.00</b> | -          |
| <b>4.00</b>             | <b>54.50</b> | V55        |
| <b>4.00</b>             | <b>55.00</b> | -          |
| <b>4.00</b>             | <b>56.00</b> | -          |
| <b>4.00</b>             | <b>57.00</b> | -          |
| <b>4.00</b>             | <b>58.00</b> | -          |
| <b>4.00</b>             | <b>59.00</b> | -          |
| <b>4.00</b>             | <b>60.00</b> | -          |
| 4.00                    | 61.00        | -          |
| <b>4.00</b>             | <b>62.00</b> | -          |
| <b>4.00</b>             | <b>63.00</b> | -          |
| <b>4.00</b>             | <b>64.00</b> | -          |
| <b>4.00</b>             | <b>65.00</b> | -          |
| <b>4.00</b>             | <b>66.00</b> | -          |
| <b>4.00</b>             | <b>67.00</b> | -          |
| <b>4.00</b>             | <b>68.00</b> | -          |
| <b>4.00</b>             | <b>69.00</b> | V70        |
| <b>4.00</b>             | <b>70.00</b> | -          |
| <b>4.00</b>             | <b>71.00</b> | -          |
| <b>4.00</b>             | <b>72.00</b> | -          |
| <b>4.00</b>             | <b>73.00</b> | -          |
| 4.00                    | 74.00        | -          |
| <b>4.00</b>             | <b>75.00</b> | -          |
| <b>4.00</b>             | <b>76.00</b> | -          |
| 4.00                    | 77.00        | -          |
| <b>4.00</b>             | <b>78.00</b> | -          |
| <b>4.00</b>             | <b>79.00</b> | -          |

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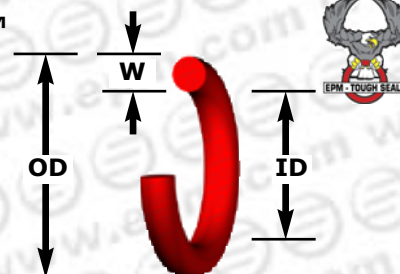
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| <b>4.00</b>             | <b>80.00</b>  | -          |
| <b>4.00</b>             | <b>81.00</b>  | -          |
| <b>4.00</b>             | <b>82.00</b>  | -          |
| 4.00                    | 83.00         | -          |
| <b>4.00</b>             | <b>84.00</b>  | -          |
| <b>4.00</b>             | <b>85.00</b>  | V85        |
| <b>4.00</b>             | <b>86.00</b>  | -          |
| 4.00                    | 86.50         | -          |
| 4.00                    | 87.00         | -          |
| 4.00                    | 88.00         | -          |
| <b>4.00</b>             | <b>89.00</b>  | -          |
| <b>4.00</b>             | <b>90.00</b>  | -          |
| <b>4.00</b>             | <b>91.00</b>  | -          |
| <b>4.00</b>             | <b>92.00</b>  | -          |
| 4.00                    | 93.00         | -          |
| 4.00                    | 94.00         | -          |
| <b>4.00</b>             | <b>95.00</b>  | -          |
| 4.00                    | 96.00         | -          |
| 4.00                    | 97.00         | -          |
| <b>4.00</b>             | <b>98.00</b>  | -          |
| <b>4.00</b>             | <b>99.00</b>  | V100       |
| <b>4.00</b>             | <b>100.00</b> | -          |
| 4.00                    | 101.00        | -          |
| <b>4.00</b>             | <b>102.00</b> | -          |
| 4.00                    | 103.00        | -          |
| <b>4.00</b>             | <b>104.00</b> | -          |
| <b>4.00</b>             | <b>105.00</b> | -          |
| 4.00                    | 106.00        | -          |
| 4.00                    | 107.00        | -          |
| <b>4.00</b>             | <b>108.00</b> | -          |
| 4.00                    | 109.00        | -          |
| <b>4.00</b>             | <b>110.00</b> | -          |
| <b>4.00</b>             | <b>111.00</b> | -          |
| <b>4.00</b>             | <b>112.00</b> | -          |
| 4.00                    | 113.00        | -          |
| <b>4.00</b>             | <b>114.00</b> | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| <b>4.00</b>             | <b>115.00</b> | -          |
| 4.00                    | 116.00        | -          |
| <b>4.00</b>             | <b>117.00</b> | -          |
| <b>4.00</b>             | <b>118.00</b> | -          |
| <b>4.00</b>             | <b>119.00</b> | -          |
| <b>4.00</b>             | <b>120.00</b> | V120       |
| <b>4.00</b>             | <b>121.00</b> | -          |
| 4.00                    | 122.00        | -          |
| 4.00                    | 123.00        | -          |
| <b>4.00</b>             | <b>124.00</b> | -          |
| 4.00                    | 125.00        | -          |
| <b>4.00</b>             | <b>126.00</b> | -          |
| <b>4.00</b>             | <b>127.00</b> | -          |
| <b>4.00</b>             | <b>128.00</b> | -          |
| <b>4.00</b>             | <b>129.00</b> | -          |
| <b>4.00</b>             | <b>130.00</b> | -          |
| 4.00                    | 131.00        | -          |
| 4.00                    | 132.00        | -          |
| <b>4.00</b>             | <b>133.00</b> | -          |
| 4.00                    | 134.00        | -          |
| <b>4.00</b>             | <b>135.00</b> | -          |
| <b>4.00</b>             | <b>136.00</b> | -          |
| <b>4.00</b>             | <b>137.00</b> | -          |
| 4.00                    | 138.00        | -          |
| 4.00                    | 139.00        | -          |
| <b>4.00</b>             | <b>140.00</b> | -          |
| 4.00                    | 141.00        | -          |
| <b>4.00</b>             | <b>142.00</b> | -          |
| 4.00                    | 143.00        | -          |
| 4.00                    | 144.00        | -          |
| <b>4.00</b>             | <b>145.00</b> | -          |
| <b>4.00</b>             | <b>146.00</b> | -          |
| 4.00                    | 147.00        | -          |
| 4.00                    | 148.00        | -          |
| <b>4.00</b>             | <b>148.50</b> | V150       |
| 4.00                    | 149.00        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| <b>4.00</b>             | <b>150.00</b> | -          |
| 4.00                    | 151.00        | -          |
| <b>4.00</b>             | <b>152.00</b> | -          |
| 4.00                    | 153.00        | -          |
| 4.00                    | 154.00        | -          |
| <b>4.00</b>             | <b>155.00</b> | -          |
| 4.00                    | 156.00        | -          |
| 4.00                    | 157.00        | -          |
| <b>4.00</b>             | <b>158.00</b> | -          |
| 4.00                    | 159.00        | -          |
| <b>4.00</b>             | <b>160.00</b> | -          |
| 4.00                    | 161.00        | -          |
| 4.00                    | 162.00        | -          |
| 4.00                    | 163.00        | -          |
| <b>4.00</b>             | <b>164.00</b> | -          |
| <b>4.00</b>             | <b>165.00</b> | -          |
| 4.00                    | 166.00        | -          |
| 4.00                    | 167.00        | -          |
| 4.00                    | 168.00        | -          |
| 4.00                    | 169.00        | -          |
| 4.00                    | 170.00        | -          |
| <b>4.00</b>             | <b>171.00</b> | -          |
| <b>4.00</b>             | <b>172.00</b> | -          |
| <b>4.00</b>             | <b>173.00</b> | V175       |
| <b>4.00</b>             | <b>174.00</b> | -          |
| 4.00                    | 175.00        | -          |
| 4.00                    | 176.00        | -          |
| <b>4.00</b>             | <b>177.00</b> | -          |
| 4.00                    | 178.00        | -          |
| 4.00                    | 179.00        | -          |
| <b>4.00</b>             | <b>180.00</b> | -          |
| 4.00                    | 181.00        | -          |
| 4.00                    | 182.00        | -          |
| 4.00                    | 183.00        | -          |
| 4.00                    | 184.00        | -          |
| 4.00                    | 185.00        | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

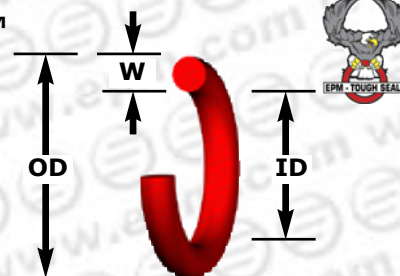
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 4.00                    | 186.00        | -          |
| 4.00                    | 187.00        | -          |
| 4.00                    | 188.00        | -          |
| 4.00                    | 189.00        | -          |
| 4.00                    | 190.00        | -          |
| 4.00                    | 191.00        | -          |
| 4.00                    | 192.00        | -          |
| 4.00                    | 193.00        | -          |
| 4.00                    | 194.00        | -          |
| <b>4.00</b>             | <b>195.00</b> | -          |
| 4.00                    | 196.00        | -          |
| 4.00                    | 197.00        | -          |
| 4.00                    | 198.00        | -          |
| 4.00                    | 199.00        | -          |
| <b>4.00</b>             | <b>200.00</b> | -          |
| 4.00                    | 201.00        | -          |
| 4.00                    | 202.00        | -          |
| 4.00                    | 203.00        | -          |
| 4.00                    | 204.00        | -          |
| 4.00                    | 205.00        | -          |
| 4.00                    | 206.00        | -          |
| 4.00                    | 207.00        | -          |
| 4.00                    | 208.00        | -          |
| 4.00                    | 209.00        | -          |
| 4.00                    | 210.00        | -          |
| 4.00                    | 211.00        | -          |
| 4.00                    | 212.00        | -          |
| 4.00                    | 213.00        | -          |
| 4.00                    | 214.00        | -          |
| <b>4.00</b>             | <b>215.00</b> | -          |
| 4.00                    | 216.00        | -          |
| 4.00                    | 217.00        | -          |
| 4.00                    | 218.00        | -          |
| 4.00                    | 219.00        | -          |
| 4.00                    | 220.00        | -          |
| 4.00                    | 221.00        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 4.00                    | 222.00        | -          |
| 4.00                    | 223.00        | -          |
| 4.00                    | 224.00        | -          |
| 4.00                    | 225.00        | -          |
| 4.00                    | 226.00        | -          |
| 4.00                    | 227.00        | -          |
| 4.00                    | 228.00        | -          |
| 4.00                    | 229.00        | -          |
| 4.00                    | 230.00        | -          |
| 4.00                    | 231.00        | -          |
| 4.00                    | 232.00        | -          |
| 4.00                    | 233.00        | -          |
| 4.00                    | 234.00        | -          |
| 4.00                    | 235.00        | -          |
| 4.00                    | 236.00        | -          |
| 4.00                    | 237.00        | -          |
| 4.00                    | 238.00        | -          |
| 4.00                    | 239.00        | -          |
| <b>4.00</b>             | <b>240.00</b> | -          |
| 4.00                    | 241.00        | -          |
| <b>4.00</b>             | <b>242.00</b> | -          |
| 4.00                    | 243.00        | -          |
| 4.00                    | 244.00        | -          |
| 4.00                    | 245.00        | -          |
| 4.00                    | 246.00        | -          |
| 4.00                    | 247.00        | -          |
| 4.00                    | 248.00        | -          |
| <b>4.00</b>             | <b>249.00</b> | -          |
| <b>4.00</b>             | <b>250.00</b> | -          |
| 4.00                    | 251.00        | -          |
| 4.00                    | 252.00        | -          |
| 4.00                    | 253.00        | -          |
| 4.00                    | 254.00        | -          |
| 4.00                    | 255.00        | -          |
| 4.00                    | 256.00        | -          |
| 4.00                    | 257.00        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 4.00                    | 258.00        | -          |
| 4.00                    | 259.00        | -          |
| 4.00                    | 260.00        | -          |
| 4.00                    | 261.00        | -          |
| 4.00                    | 262.00        | -          |
| 4.00                    | 263.00        | -          |
| 4.00                    | 264.00        | -          |
| <b>4.00</b>             | <b>265.00</b> | -          |
| <b>4.00</b>             | <b>266.00</b> | -          |
| 4.00                    | 267.00        | -          |
| 4.00                    | 268.00        | -          |
| 4.00                    | 269.00        | -          |
| <b>4.00</b>             | <b>270.00</b> | -          |
| 4.00                    | 271.00        | -          |
| 4.00                    | 272.00        | -          |
| 4.00                    | 273.00        | -          |
| 4.00                    | 274.00        | -          |
| 4.00                    | 275.00        | -          |
| 4.00                    | 276.00        | -          |
| 4.00                    | 277.00        | -          |
| 4.00                    | 278.00        | -          |
| 4.00                    | 279.00        | -          |
| 4.00                    | 280.00        | -          |
| 4.00                    | 281.00        | -          |
| 4.00                    | 282.00        | -          |
| 4.00                    | 283.00        | -          |
| 4.00                    | 284.00        | -          |
| <b>4.00</b>             | <b>285.00</b> | -          |
| 4.00                    | 286.00        | -          |
| 4.00                    | 287.00        | -          |
| 4.00                    | 288.00        | -          |
| 4.00                    | 289.00        | -          |
| 4.00                    | 290.00        | -          |
| 4.00                    | 291.00        | -          |
| 4.00                    | 292.00        | -          |
| 4.00                    | 293.00        | -          |



**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

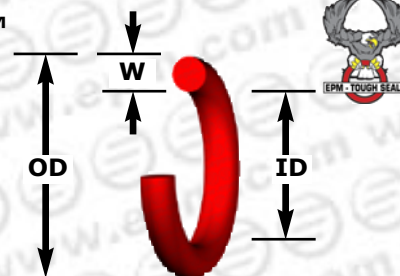
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 4.00                    | 294.00        | -          |
| 4.00                    | 295.00        | -          |
| 4.00                    | 296.00        | -          |
| 4.00                    | 297.00        | -          |
| 4.00                    | 298.00        | -          |
| 4.00                    | 299.00        | -          |
| <b>4.00</b>             | <b>300.00</b> | -          |
| 4.00                    | 301.00        | -          |
| 4.00                    | 302.00        | -          |
| 4.00                    | 303.00        | -          |
| 4.00                    | 304.00        | -          |
| 4.00                    | 305.00        | -          |
| 4.00                    | 306.00        | -          |
| 4.00                    | 307.00        | -          |
| 4.00                    | 308.00        | -          |
| 4.00                    | 309.00        | -          |
| 4.00                    | 310.00        | -          |
| 4.00                    | 311.00        | -          |
| 4.00                    | 312.00        | -          |
| 4.00                    | 313.00        | -          |
| <b>4.00</b>             | <b>314.00</b> | -          |
| 4.00                    | 315.00        | -          |
| 4.00                    | 316.00        | -          |
| 4.00                    | 317.00        | -          |
| 4.00                    | 318.00        | -          |
| 4.00                    | 319.00        | -          |
| 4.00                    | 320.00        | -          |
| 4.00                    | 321.00        | -          |
| 4.00                    | 322.00        | -          |
| 4.00                    | 323.00        | -          |
| 4.00                    | 324.00        | -          |
| 4.00                    | 325.00        | -          |
| 4.00                    | 326.00        | -          |
| 4.00                    | 327.00        | -          |
| 4.00                    | 328.00        | -          |
| 4.00                    | 329.00        | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 4.00                    | 330.00    | -          |
| 4.00                    | 331.00    | -          |
| 4.00                    | 332.00    | -          |
| 4.00                    | 333.00    | -          |
| 4.00                    | 334.00    | -          |
| 4.00                    | 335.00    | -          |
| 4.00                    | 336.00    | -          |
| 4.00                    | 337.00    | -          |
| 4.00                    | 338.00    | -          |
| 4.00                    | 339.00    | -          |
| 4.00                    | 340.00    | -          |
| 4.00                    | 341.00    | -          |
| 4.00                    | 342.00    | -          |
| 4.00                    | 343.00    | -          |
| 4.00                    | 344.00    | -          |
| 4.00                    | 345.00    | -          |
| 4.00                    | 346.00    | -          |
| 4.00                    | 347.00    | -          |
| 4.00                    | 348.00    | -          |
| 4.00                    | 349.00    | -          |
| 4.00                    | 350.00    | -          |
| 4.00                    | 351.00    | -          |
| 4.00                    | 352.00    | -          |
| 4.00                    | 353.00    | -          |
| 4.00                    | 354.00    | -          |
| 4.00                    | 355.00    | -          |
| 4.00                    | 356.00    | -          |
| 4.00                    | 357.00    | -          |
| 4.00                    | 358.00    | -          |
| 4.00                    | 359.00    | -          |
| 4.00                    | 360.00    | -          |
| 4.00                    | 361.00    | -          |
| 4.00                    | 362.00    | -          |
| 4.00                    | 363.00    | -          |
| 4.00                    | 364.00    | -          |
| 4.00                    | 365.00    | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 4.00                    | 366.00    | -          |
| 4.00                    | 367.00    | -          |
| 4.00                    | 368.00    | -          |
| 4.00                    | 369.00    | -          |
| 4.00                    | 370.00    | -          |
| 4.00                    | 371.00    | -          |
| 4.00                    | 372.00    | -          |
| 4.00                    | 373.00    | -          |
| 4.00                    | 374.00    | -          |
| 4.00                    | 375.00    | -          |
| 4.00                    | 376.00    | -          |
| 4.00                    | 377.00    | -          |
| 4.00                    | 378.00    | -          |
| 4.00                    | 379.00    | -          |
| 4.00                    | 380.00    | -          |
| 4.00                    | 381.00    | -          |
| 4.00                    | 382.00    | -          |
| 4.00                    | 383.00    | -          |
| 4.00                    | 384.00    | -          |
| 4.00                    | 385.00    | -          |
| 4.00                    | 386.00    | -          |
| 4.00                    | 387.00    | -          |
| 4.00                    | 388.00    | -          |
| 4.00                    | 389.00    | -          |
| 4.00                    | 390.00    | -          |
| 4.00                    | 391.00    | -          |
| 4.00                    | 392.00    | -          |
| 4.00                    | 393.00    | -          |
| 4.00                    | 394.00    | -          |
| 4.00                    | 395.00    | -          |
| 4.00                    | 396.00    | -          |
| 4.00                    | 397.00    | -          |
| 4.00                    | 398.00    | -          |
| 4.00                    | 399.00    | -          |
| 4.00                    | 400.00    | -          |
| 4.00                    | 401.00    | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

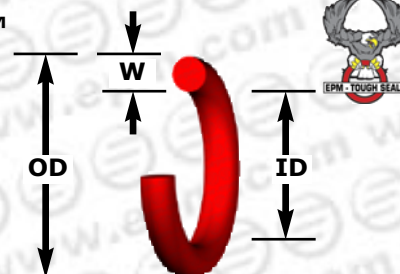
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 4.00                    | 402.00    | -          |
| 4.00                    | 403.00    | -          |
| 4.00                    | 404.00    | -          |
| 4.00                    | 405.00    | -          |
| 4.00                    | 406.00    | -          |
| 4.00                    | 407.00    | -          |
| 4.00                    | 408.00    | -          |
| 4.00                    | 409.00    | -          |
| 4.00                    | 410.00    | -          |
| 4.00                    | 411.00    | -          |
| 4.00                    | 412.00    | -          |
| 4.00                    | 413.00    | -          |
| 4.00                    | 414.00    | -          |
| 4.00                    | 415.00    | -          |
| 4.00                    | 416.00    | -          |
| 4.00                    | 417.00    | -          |
| 4.00                    | 418.00    | -          |
| 4.00                    | 419.00    | -          |
| 4.00                    | 420.00    | -          |
| 4.00                    | 421.00    | -          |
| 4.00                    | 422.00    | -          |
| 4.00                    | 423.00    | -          |
| 4.00                    | 424.00    | -          |
| 4.00                    | 425.00    | -          |
| 4.00                    | 426.00    | -          |
| 4.00                    | 427.00    | -          |
| 4.00                    | 428.00    | -          |
| 4.00                    | 429.00    | -          |
| 4.00                    | 430.00    | -          |
| 4.00                    | 431.00    | -          |
| 4.00                    | 432.00    | -          |
| 4.00                    | 433.00    | -          |
| 4.00                    | 434.00    | -          |
| 4.00                    | 435.00    | -          |
| 4.00                    | 436.00    | -          |
| 4.00                    | 437.00    | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 4.00                    | 438.00    | -          |
| 4.00                    | 439.00    | -          |
| 4.00                    | 440.00    | -          |
| 4.00                    | 441.00    | -          |
| 4.00                    | 442.00    | -          |
| 4.00                    | 443.00    | -          |
| 4.00                    | 444.00    | -          |
| 4.00                    | 445.00    | -          |
| 4.00                    | 446.00    | -          |
| 4.00                    | 447.00    | -          |
| 4.00                    | 448.00    | -          |
| 4.00                    | 449.00    | -          |
| 4.00                    | 450.00    | -          |
| 4.00                    | 451.00    | -          |
| 4.00                    | 452.00    | -          |
| 4.00                    | 453.00    | -          |
| 4.00                    | 454.00    | -          |
| 4.00                    | 455.00    | -          |
| 4.00                    | 456.00    | -          |
| 4.00                    | 457.00    | -          |
| 4.00                    | 458.00    | -          |
| 4.00                    | 459.00    | -          |
| 4.00                    | 460.00    | -          |
| 4.00                    | 461.00    | -          |
| 4.00                    | 462.00    | -          |
| 4.00                    | 463.00    | -          |
| 4.00                    | 464.00    | -          |
| 4.00                    | 465.00    | -          |
| 4.00                    | 466.00    | -          |
| 4.00                    | 467.00    | -          |
| 4.00                    | 468.00    | -          |
| 4.00                    | 469.00    | -          |
| 4.00                    | 470.00    | -          |
| 4.00                    | 471.00    | -          |
| 4.00                    | 472.00    | -          |
| 4.00                    | 473.00    | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 4.00                    | 474.00    | -          |
| 4.00                    | 475.00    | -          |
| 4.00                    | 476.00    | -          |
| 4.00                    | 477.00    | -          |
| 4.00                    | 478.00    | -          |
| 4.00                    | 479.00    | -          |
| 4.00                    | 480.00    | -          |
| 4.00                    | 481.00    | -          |
| 4.00                    | 482.00    | -          |
| 4.00                    | 483.00    | -          |
| 4.00                    | 484.00    | -          |
| 4.00                    | 485.00    | -          |
| 4.00                    | 486.00    | -          |
| 4.00                    | 487.00    | -          |
| 4.00                    | 488.00    | -          |
| 4.00                    | 489.00    | -          |
| 4.00                    | 490.00    | -          |
| 4.00                    | 491.00    | -          |
| 4.00                    | 492.00    | -          |
| 4.00                    | 493.00    | -          |
| 4.00                    | 494.00    | -          |
| 4.00                    | 495.00    | -          |
| 4.00                    | 496.00    | -          |
| 4.00                    | 497.00    | -          |
| 4.00                    | 498.00    | -          |
| 4.00                    | 499.00    | -          |
| 4.00                    | 500.00    | -          |
| 4.50                    | 6.00      | -          |
| 4.50                    | 8.00      | -          |
| 4.50                    | 9.00      | -          |
| 4.50                    | 9.50      | -          |
| 4.50                    | 10.00     | -          |
| 4.50                    | 10.50     | -          |
| 4.50                    | 11.00     | -          |
| 4.50                    | 12.00     | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

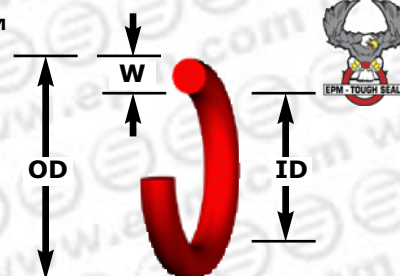
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 4.50                    | 13.00     | -          |
| 4.50                    | 15.00     | -          |
| 4.50                    | 15.50     | -          |
| 4.50                    | 16.00     | -          |
| 4.50                    | 17.00     | -          |
| 4.50                    | 18.00     | -          |
| 4.50                    | 19.00     | -          |
| 4.50                    | 20.00     | -          |
| 4.50                    | 21.00     | -          |
| 4.50                    | 21.50     | -          |
| 4.50                    | 22.00     | -          |
| 4.50                    | 22.50     | -          |
| 4.50                    | 23.00     | -          |
| 4.50                    | 24.00     | -          |
| 4.50                    | 24.50     | -          |
| 4.50                    | 25.00     | -          |
| 4.50                    | 26.00     | -          |
| 4.50                    | 27.00     | -          |
| 4.50                    | 27.50     | -          |
| 4.50                    | 28.00     | -          |
| 4.50                    | 28.50     | -          |
| 4.50                    | 29.00     | -          |
| 4.50                    | 29.50     | -          |
| 4.50                    | 30.00     | -          |
| 4.50                    | 31.00     | -          |
| 4.50                    | 31.50     | -          |
| 4.50                    | 32.00     | -          |
| 4.50                    | 33.00     | -          |
| 4.50                    | 34.00     | -          |
| 4.50                    | 34.50     | -          |
| 4.50                    | 35.00     | -          |
| 4.50                    | 35.50     | -          |
| 4.50                    | 36.00     | -          |
| 4.50                    | 37.00     | -          |
| 4.50                    | 37.50     | -          |
| 4.50                    | 38.00     | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 4.50                    | 39.00     | -          |
| 4.50                    | 40.00     | -          |
| 4.50                    | 40.50     | -          |
| 4.50                    | 41.00     | -          |
| 4.50                    | 42.00     | -          |
| 4.50                    | 43.00     | -          |
| 4.50                    | 44.00     | -          |
| 4.50                    | 45.00     | -          |
| 4.50                    | 46.00     | -          |
| 4.50                    | 47.00     | -          |
| 4.50                    | 48.00     | -          |
| 4.50                    | 49.00     | -          |
| 4.50                    | 50.00     | -          |
| 4.50                    | 51.00     | -          |
| 4.50                    | 53.00     | -          |
| 4.50                    | 56.00     | -          |
| 4.50                    | 57.00     | -          |
| 4.50                    | 60.00     | -          |
| 4.50                    | 61.00     | -          |
| 4.50                    | 62.00     | -          |
| 4.50                    | 63.00     | -          |
| 4.50                    | 64.00     | -          |
| 4.50                    | 65.00     | -          |
| 4.50                    | 66.00     | -          |
| 4.50                    | 68.00     | -          |
| 4.50                    | 69.00     | -          |
| 4.50                    | 70.00     | -          |
| 4.50                    | 71.00     | -          |
| 4.50                    | 73.00     | -          |
| 4.50                    | 74.00     | -          |
| 4.50                    | 75.00     | -          |
| 4.50                    | 76.00     | -          |
| 4.50                    | 80.00     | -          |
| 4.50                    | 81.00     | -          |
| 4.50                    | 83.00     | -          |
| 4.50                    | 85.00     | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 4.50                    | 86.00     | -          |
| 4.50                    | 89.00     | -          |
| 4.50                    | 90.00     | -          |
| 4.50                    | 92.00     | -          |
| 4.50                    | 93.50     | -          |
| 4.50                    | 95.00     | -          |
| 4.50                    | 97.50     | -          |
| 4.50                    | 98.00     | -          |
| 4.50                    | 99.50     | -          |
| 4.50                    | 100.00    | -          |
| 4.50                    | 100.50    | -          |
| 4.50                    | 101.00    | -          |
| 4.50                    | 103.50    | -          |
| 4.50                    | 105.00    | -          |
| 4.50                    | 106.00    | -          |
| 4.50                    | 110.00    | -          |
| 4.50                    | 115.00    | -          |
| 4.50                    | 118.00    | -          |
| 4.50                    | 120.00    | -          |
| 4.50                    | 122.00    | -          |
| 4.50                    | 124.00    | -          |
| 4.50                    | 126.00    | -          |
| 4.50                    | 128.00    | -          |
| 4.50                    | 130.00    | -          |
| 4.50                    | 131.50    | -          |
| 4.50                    | 134.50    | -          |
| 4.50                    | 137.00    | -          |
| 4.50                    | 140.00    | -          |
| 4.50                    | 140.50    | -          |
| 4.50                    | 150.00    | -          |
| 4.50                    | 153.00    | -          |
| 4.50                    | 155.00    | -          |
| 4.50                    | 157.00    | -          |
| 4.50                    | 160.00    | -          |
| 4.50                    | 165.00    | -          |
| 4.50                    | 172.00    | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

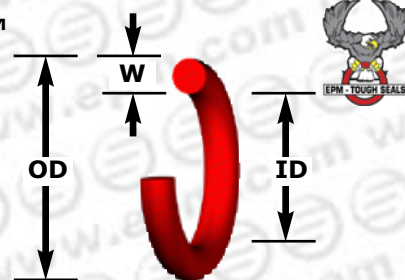
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| 4.50                    | 178.00       | -          |
| 4.50                    | 180.00       | -          |
| 4.50                    | 185.00       | -          |
| 4.50                    | 186.00       | -          |
| 4.50                    | 189.50       | -          |
| 4.50                    | 192.00       | -          |
| 4.50                    | 208.00       | -          |
| 4.50                    | 215.00       | -          |
| 4.50                    | 218.00       | -          |
| 4.50                    | 225.00       | -          |
| 4.50                    | 227.00       | -          |
| 4.50                    | 250.00       | -          |
| 4.50                    | 267.00       | -          |
| 4.50                    | 280.00       | -          |
| 4.50                    | 315.00       | -          |
| 4.76                    | 7.93         | -          |
| 5.00                    | 4.00         | -          |
| 5.00                    | 5.00         | -          |
| 5.00                    | 6.00         | -          |
| 5.00                    | 7.00         | -          |
| 5.00                    | 8.00         | -          |
| 5.00                    | 9.00         | -          |
| 5.00                    | 10.00        | -          |
| 5.00                    | 11.00        | -          |
| 5.00                    | 12.00        | -          |
| 5.00                    | 13.00        | -          |
| 5.00                    | 14.00        | -          |
| <b>5.00</b>             | <b>15.00</b> | -          |
| <b>5.00</b>             | <b>16.00</b> | -          |
| 5.00                    | 17.00        | -          |
| 5.00                    | 18.00        | -          |
| <b>5.00</b>             | <b>19.00</b> | -          |
| <b>5.00</b>             | <b>20.00</b> | -          |
| <b>5.00</b>             | <b>21.00</b> | -          |
| <b>5.00</b>             | <b>22.00</b> | -          |
| 5.00                    | 23.00        | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>5.00</b>             | <b>24.00</b> | -          |
| <b>5.00</b>             | <b>25.00</b> | -          |
| 5.00                    | 26.00        | -          |
| <b>5.00</b>             | <b>27.00</b> | -          |
| <b>5.00</b>             | <b>28.00</b> | -          |
| 5.00                    | 29.00        | -          |
| <b>5.00</b>             | <b>30.00</b> | -          |
| <b>5.00</b>             | <b>31.00</b> | -          |
| <b>5.00</b>             | <b>32.00</b> | -          |
| 5.00                    | 33.00        | -          |
| 5.00                    | 34.00        | -          |
| <b>5.00</b>             | <b>35.00</b> | -          |
| 5.00                    | 36.00        | -          |
| 5.00                    | 37.00        | -          |
| <b>5.00</b>             | <b>38.00</b> | -          |
| <b>5.00</b>             | <b>39.00</b> | -          |
| <b>5.00</b>             | <b>40.00</b> | -          |
| 5.00                    | 41.00        | -          |
| <b>5.00</b>             | <b>42.00</b> | -          |
| 5.00                    | 43.00        | -          |
| <b>5.00</b>             | <b>44.00</b> | -          |
| <b>5.00</b>             | <b>45.00</b> | -          |
| <b>5.00</b>             | <b>46.00</b> | -          |
| <b>5.00</b>             | <b>47.00</b> | -          |
| 5.00                    | 48.00        | -          |
| 5.00                    | 49.00        | -          |
| <b>5.00</b>             | <b>50.00</b> | -          |
| 5.00                    | 51.00        | -          |
| <b>5.00</b>             | <b>52.00</b> | -          |
| 5.00                    | 53.00        | -          |
| 5.00                    | 54.00        | -          |
| <b>5.00</b>             | <b>55.00</b> | -          |
| 5.00                    | 56.00        | -          |
| 5.00                    | 57.00        | -          |
| <b>5.00</b>             | <b>58.00</b> | -          |
| 5.00                    | 59.00        | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>5.00</b>             | <b>60.00</b> | -          |
| <b>5.00</b>             | <b>61.00</b> | -          |
| 5.00                    | 62.00        | -          |
| <b>5.00</b>             | <b>63.00</b> | -          |
| <b>5.00</b>             | <b>64.00</b> | -          |
| <b>5.00</b>             | <b>65.00</b> | -          |
| 5.00                    | 66.00        | -          |
| <b>5.00</b>             | <b>67.00</b> | -          |
| <b>5.00</b>             | <b>68.00</b> | -          |
| 5.00                    | 69.00        | -          |
| <b>5.00</b>             | <b>70.00</b> | -          |
| 5.00                    | 71.00        | -          |
| 5.00                    | 72.00        | -          |
| <b>5.00</b>             | <b>73.00</b> | -          |
| 5.00                    | 74.00        | -          |
| 5.00                    | 75.00        | -          |
| <b>5.00</b>             | <b>76.00</b> | -          |
| 5.00                    | 77.00        | -          |
| <b>5.00</b>             | <b>78.00</b> | -          |
| 5.00                    | 79.00        | -          |
| <b>5.00</b>             | <b>80.00</b> | -          |
| 5.00                    | 81.00        | -          |
| <b>5.00</b>             | <b>82.00</b> | -          |
| 5.00                    | 83.00        | -          |
| <b>5.00</b>             | <b>84.00</b> | -          |
| <b>5.00</b>             | <b>85.00</b> | -          |
| 5.00                    | 86.00        | -          |
| <b>5.00</b>             | <b>87.00</b> | -          |
| 5.00                    | 88.00        | -          |
| 5.00                    | 89.00        | -          |
| <b>5.00</b>             | <b>90.00</b> | -          |
| 5.00                    | 91.00        | -          |
| <b>5.00</b>             | <b>92.00</b> | -          |
| 5.00                    | 93.00        | -          |
| 5.00                    | 94.00        | -          |
| <b>5.00</b>             | <b>95.00</b> | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

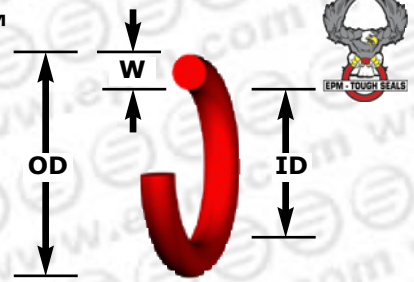
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 5.00                    | 96.00         | -          |
| <b>5.00</b>             | <b>97.00</b>  | -          |
| 5.00                    | 98.00         | -          |
| 5.00                    | 99.00         | -          |
| <b>5.00</b>             | <b>100.00</b> | -          |
| 5.00                    | 101.00        | -          |
| <b>5.00</b>             | <b>102.00</b> | -          |
| 5.00                    | 103.00        | -          |
| 5.00                    | 104.00        | -          |
| <b>5.00</b>             | <b>105.00</b> | -          |
| 5.00                    | 106.00        | -          |
| <b>5.00</b>             | <b>107.00</b> | -          |
| <b>5.00</b>             | <b>108.00</b> | -          |
| 5.00                    | 109.00        | -          |
| <b>5.00</b>             | <b>110.00</b> | -          |
| 5.00                    | 111.00        | -          |
| <b>5.00</b>             | <b>112.00</b> | -          |
| 5.00                    | 113.00        | -          |
| 5.00                    | 114.00        | -          |
| 5.00                    | 115.00        | -          |
| <b>5.00</b>             | <b>116.00</b> | -          |
| 5.00                    | 117.00        | -          |
| <b>5.00</b>             | <b>118.00</b> | -          |
| 5.00                    | 119.00        | -          |
| <b>5.00</b>             | <b>120.00</b> | -          |
| <b>5.00</b>             | <b>121.00</b> | -          |
| <b>5.00</b>             | <b>122.00</b> | -          |
| 5.00                    | 123.00        | -          |
| 5.00                    | 124.00        | -          |
| <b>5.00</b>             | <b>125.00</b> | -          |
| <b>5.00</b>             | <b>126.00</b> | -          |
| 5.00                    | 127.00        | -          |
| <b>5.00</b>             | <b>128.00</b> | -          |
| 5.00                    | 129.00        | -          |
| <b>5.00</b>             | <b>130.00</b> | -          |
| 5.00                    | 131.00        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 5.00                    | 132.00        | -          |
| 5.00                    | 133.00        | -          |
| 5.00                    | 134.00        | -          |
| <b>5.00</b>             | <b>135.00</b> | -          |
| 5.00                    | 136.00        | -          |
| 5.00                    | 137.00        | -          |
| <b>5.00</b>             | <b>138.00</b> | -          |
| 5.00                    | 139.00        | -          |
| <b>5.00</b>             | <b>140.00</b> | -          |
| 5.00                    | 141.00        | -          |
| 5.00                    | 142.00        | -          |
| <b>5.00</b>             | <b>143.00</b> | -          |
| <b>5.00</b>             | <b>144.00</b> | -          |
| 5.00                    | 145.00        | -          |
| 5.00                    | 146.00        | -          |
| 5.00                    | 147.00        | -          |
| <b>5.00</b>             | <b>148.00</b> | -          |
| 5.00                    | 149.00        | -          |
| <b>5.00</b>             | <b>150.00</b> | -          |
| 5.00                    | 151.00        | -          |
| 5.00                    | 152.00        | -          |
| 5.00                    | 153.00        | -          |
| 5.00                    | 154.00        | -          |
| <b>5.00</b>             | <b>155.00</b> | -          |
| 5.00                    | 156.00        | -          |
| 5.00                    | 157.00        | -          |
| <b>5.00</b>             | <b>158.00</b> | -          |
| 5.00                    | 159.00        | -          |
| <b>5.00</b>             | <b>160.00</b> | -          |
| 5.00                    | 161.00        | -          |
| 5.00                    | 162.00        | -          |
| 5.00                    | 163.00        | -          |
| 5.00                    | 164.00        | -          |
| <b>5.00</b>             | <b>165.00</b> | -          |
| 5.00                    | 166.00        | -          |
| <b>5.00</b>             | <b>167.00</b> | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 5.00                    | 168.00        | -          |
| 5.00                    | 169.00        | -          |
| <b>5.00</b>             | <b>170.00</b> | -          |
| <b>5.00</b>             | <b>171.00</b> | -          |
| 5.00                    | 172.00        | -          |
| 5.00                    | 173.00        | -          |
| 5.00                    | 174.00        | -          |
| <b>5.00</b>             | <b>175.00</b> | -          |
| 5.00                    | 176.00        | -          |
| <b>5.00</b>             | <b>177.00</b> | -          |
| 5.00                    | 178.00        | -          |
| 5.00                    | 179.00        | -          |
| <b>5.00</b>             | <b>180.00</b> | -          |
| 5.00                    | 181.00        | -          |
| <b>5.00</b>             | <b>182.00</b> | -          |
| 5.00                    | 183.00        | -          |
| 5.00                    | 184.00        | -          |
| 5.00                    | 185.00        | -          |
| 5.00                    | 186.00        | -          |
| 5.00                    | 187.00        | -          |
| <b>5.00</b>             | <b>188.00</b> | -          |
| 5.00                    | 189.00        | -          |
| 5.00                    | 190.00        | -          |
| 5.00                    | 191.00        | -          |
| 5.00                    | 192.00        | -          |
| 5.00                    | 193.00        | -          |
| 5.00                    | 194.00        | -          |
| <b>5.00</b>             | <b>195.00</b> | -          |
| 5.00                    | 196.00        | -          |
| 5.00                    | 197.00        | -          |
| 5.00                    | 198.00        | -          |
| 5.00                    | 199.00        | -          |
| <b>5.00</b>             | <b>200.00</b> | -          |
| 5.00                    | 201.00        | -          |
| 5.00                    | 202.00        | -          |
| 5.00                    | 203.00        | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

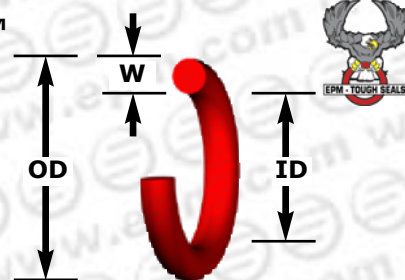
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 5.00                    | 204.00        | -          |
| <b>5.00</b>             | <b>205.00</b> | -          |
| 5.00                    | 206.00        | -          |
| 5.00                    | 208.00        | -          |
| 5.00                    | 209.00        | -          |
| <b>5.00</b>             | <b>210.00</b> | -          |
| 5.00                    | 211.00        | -          |
| 5.00                    | 212.00        | -          |
| 5.00                    | 213.00        | -          |
| 5.00                    | 214.00        | -          |
| 5.00                    | 215.00        | -          |
| <b>5.00</b>             | <b>216.00</b> | -          |
| 5.00                    | 217.00        | -          |
| 5.00                    | 218.00        | -          |
| 5.00                    | 219.00        | -          |
| <b>5.00</b>             | <b>220.00</b> | -          |
| 5.00                    | 221.00        | -          |
| <b>5.00</b>             | <b>222.00</b> | -          |
| 5.00                    | 223.00        | -          |
| 5.00                    | 224.00        | -          |
| <b>5.00</b>             | <b>225.00</b> | -          |
| 5.00                    | 226.00        | -          |
| 5.00                    | 227.00        | -          |
| 5.00                    | 228.00        | -          |
| <b>5.00</b>             | <b>229.00</b> | -          |
| 5.00                    | 230.00        | -          |
| 5.00                    | 231.00        | -          |
| 5.00                    | 232.00        | -          |
| 5.00                    | 233.00        | -          |
| 5.00                    | 234.00        | -          |
| <b>5.00</b>             | <b>235.00</b> | -          |
| <b>5.00</b>             | <b>236.00</b> | -          |
| 5.00                    | 237.00        | -          |
| 5.00                    | 238.00        | -          |
| 5.00                    | 239.00        | -          |
| <b>5.00</b>             | <b>240.00</b> | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 5.00                    | 241.00        | -          |
| 5.00                    | 242.00        | -          |
| 5.00                    | 243.00        | -          |
| 5.00                    | 244.00        | -          |
| <b>5.00</b>             | <b>245.00</b> | -          |
| 5.00                    | 246.00        | -          |
| 5.00                    | 247.00        | -          |
| 5.00                    | 248.00        | -          |
| 5.00                    | 249.00        | -          |
| <b>5.00</b>             | <b>250.00</b> | -          |
| 5.00                    | 251.00        | -          |
| 5.00                    | 252.00        | -          |
| 5.00                    | 253.00        | -          |
| 5.00                    | 254.00        | -          |
| <b>5.00</b>             | <b>255.00</b> | -          |
| 5.00                    | 256.00        | -          |
| 5.00                    | 257.00        | -          |
| 5.00                    | 258.00        | -          |
| 5.00                    | 259.00        | -          |
| 5.00                    | 260.00        | -          |
| 5.00                    | 261.00        | -          |
| 5.00                    | 262.00        | -          |
| 5.00                    | 263.00        | -          |
| 5.00                    | 264.00        | -          |
| <b>5.00</b>             | <b>265.00</b> | -          |
| 5.00                    | 266.00        | -          |
| 5.00                    | 267.00        | -          |
| 5.00                    | 268.00        | -          |
| 5.00                    | 269.00        | -          |
| 5.00                    | 270.00        | -          |
| 5.00                    | 271.00        | -          |
| 5.00                    | 272.00        | -          |
| 5.00                    | 273.00        | -          |
| 5.00                    | 274.00        | -          |
| <b>5.00</b>             | <b>275.00</b> | -          |
| 5.00                    | 276.00        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 5.00                    | 277.00        | -          |
| 5.00                    | 278.00        | -          |
| 5.00                    | 279.00        | -          |
| 5.00                    | 280.00        | -          |
| 5.00                    | 281.00        | -          |
| 5.00                    | 282.00        | -          |
| 5.00                    | 283.00        | -          |
| 5.00                    | 284.00        | -          |
| <b>5.00</b>             | <b>285.00</b> | -          |
| 5.00                    | 286.00        | -          |
| 5.00                    | 287.00        | -          |
| 5.00                    | 288.00        | -          |
| 5.00                    | 289.00        | -          |
| <b>5.00</b>             | <b>290.00</b> | -          |
| 5.00                    | 291.00        | -          |
| 5.00                    | 292.00        | -          |
| 5.00                    | 293.00        | -          |
| 5.00                    | 294.00        | -          |
| 5.00                    | 295.00        | -          |
| 5.00                    | 296.00        | -          |
| 5.00                    | 297.00        | -          |
| 5.00                    | 298.00        | -          |
| 5.00                    | 299.00        | -          |
| <b>5.00</b>             | <b>300.00</b> | -          |
| 5.00                    | 301.00        | -          |
| 5.00                    | 302.00        | -          |
| 5.00                    | 303.00        | -          |
| 5.00                    | 304.00        | -          |
| 5.00                    | 305.00        | -          |
| 5.00                    | 306.00        | -          |
| 5.00                    | 307.00        | -          |
| 5.00                    | 308.00        | -          |
| 5.00                    | 309.00        | -          |
| 5.00                    | 310.00        | -          |
| 5.00                    | 311.00        | -          |
| 5.00                    | 312.00        | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

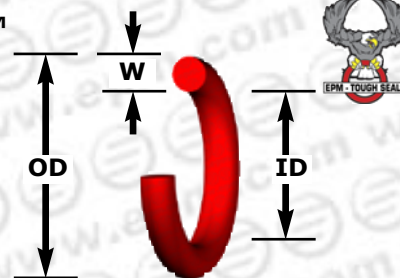
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 5.00                    | 313.00        | -          |
| 5.00                    | 314.00        | -          |
| 5.00                    | 315.00        | -          |
| 5.00                    | 316.00        | -          |
| 5.00                    | 317.00        | -          |
| 5.00                    | 318.00        | -          |
| 5.00                    | 319.00        | -          |
| 5.00                    | 320.00        | -          |
| 5.00                    | 321.00        | -          |
| 5.00                    | 322.00        | -          |
| 5.00                    | 323.00        | -          |
| 5.00                    | 324.00        | -          |
| 5.00                    | 325.00        | -          |
| 5.00                    | 326.00        | -          |
| 5.00                    | 327.00        | -          |
| 5.00                    | 328.00        | -          |
| 5.00                    | 329.00        | -          |
| <b>5.00</b>             | <b>330.00</b> | -          |
| 5.00                    | 331.00        | -          |
| 5.00                    | 332.00        | -          |
| 5.00                    | 333.00        | -          |
| 5.00                    | 334.00        | -          |
| 5.00                    | 335.00        | -          |
| 5.00                    | 336.00        | -          |
| 5.00                    | 337.00        | -          |
| <b>5.00</b>             | <b>338.00</b> | -          |
| 5.00                    | 339.00        | -          |
| 5.00                    | 340.00        | -          |
| 5.00                    | 341.00        | -          |
| 5.00                    | 342.00        | -          |
| 5.00                    | 343.00        | -          |
| 5.00                    | 344.00        | -          |
| <b>5.00</b>             | <b>345.00</b> | -          |
| 5.00                    | 346.00        | -          |
| 5.00                    | 347.00        | -          |
| 5.00                    | 348.00        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 5.00                    | 349.00        | -          |
| <b>5.00</b>             | <b>350.00</b> | -          |
| 5.00                    | 351.00        | -          |
| 5.00                    | 352.00        | -          |
| 5.00                    | 353.00        | -          |
| 5.00                    | 354.00        | -          |
| 5.00                    | 355.00        | -          |
| 5.00                    | 356.00        | -          |
| 5.00                    | 357.00        | -          |
| 5.00                    | 358.00        | -          |
| 5.00                    | 359.00        | -          |
| 5.00                    | 360.00        | -          |
| 5.00                    | 361.00        | -          |
| 5.00                    | 362.00        | -          |
| 5.00                    | 363.00        | -          |
| 5.00                    | 364.00        | -          |
| 5.00                    | 365.00        | -          |
| 5.00                    | 366.00        | -          |
| 5.00                    | 367.00        | -          |
| 5.00                    | 368.00        | -          |
| 5.00                    | 369.00        | -          |
| 5.00                    | 370.00        | -          |
| 5.00                    | 371.00        | -          |
| 5.00                    | 372.00        | -          |
| 5.00                    | 373.00        | -          |
| 5.00                    | 374.00        | -          |
| <b>5.00</b>             | <b>375.00</b> | -          |
| 5.00                    | 376.00        | -          |
| 5.00                    | 377.00        | -          |
| 5.00                    | 378.00        | -          |
| 5.00                    | 379.00        | -          |
| 5.00                    | 380.00        | -          |
| 5.00                    | 381.00        | -          |
| 5.00                    | 382.00        | -          |
| 5.00                    | 383.00        | -          |
| 5.00                    | 384.00        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 5.00                    | 385.00        | -          |
| 5.00                    | 386.00        | -          |
| 5.00                    | 387.00        | -          |
| 5.00                    | 388.00        | -          |
| 5.00                    | 389.00        | -          |
| 5.00                    | 390.00        | -          |
| 5.00                    | 391.00        | -          |
| 5.00                    | 392.00        | -          |
| 5.00                    | 393.00        | -          |
| 5.00                    | 394.00        | -          |
| <b>5.00</b>             | <b>395.00</b> | -          |
| 5.00                    | 396.00        | -          |
| 5.00                    | 397.00        | -          |
| 5.00                    | 398.00        | -          |
| 5.00                    | 399.00        | -          |
| 5.00                    | 400.00        | -          |
| 5.00                    | 415.00        | -          |
| 5.00                    | 460.00        | -          |
| 5.00                    | 470.00        | -          |
| <b>5.30</b>             | <b>40.00</b>  | -          |
| 5.30                    | 41.20         | -          |
| 5.30                    | 41.40         | -          |
| 5.30                    | 42.50         | -          |
| 5.30                    | 43.70         | -          |
| <b>5.30</b>             | <b>45.00</b>  | -          |
| 5.30                    | 46.20         | -          |
| 5.30                    | 47.50         | -          |
| 5.30                    | 48.70         | -          |
| <b>5.30</b>             | <b>50.00</b>  | -          |
| 5.30                    | 51.50         | -          |
| 5.30                    | 53.00         | -          |
| 5.30                    | 54.40         | -          |
| 5.30                    | 54.50         | -          |
| <b>5.30</b>             | <b>56.00</b>  | -          |
| 5.30                    | 58.00         | -          |
| 5.30                    | 60.00         | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

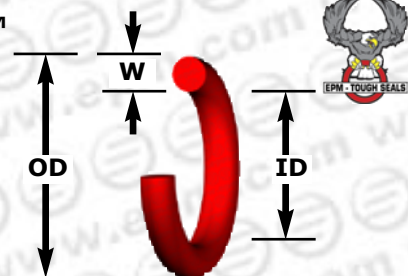
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 5.30                    | 61.50         | -          |
| <b>5.30</b>             | <b>63.00</b>  | -          |
| 5.30                    | 65.00         | -          |
| 5.30                    | 67.00         | -          |
| 5.30                    | 69.00         | -          |
| <b>5.30</b>             | <b>71.00</b>  | -          |
| 5.30                    | 73.00         | -          |
| 5.30                    | 75.00         | -          |
| 5.30                    | 77.50         | -          |
| <b>5.30</b>             | <b>80.00</b>  | -          |
| 5.30                    | 82.50         | -          |
| 5.30                    | 85.00         | -          |
| 5.30                    | 87.50         | -          |
| <b>5.30</b>             | <b>90.00</b>  | -          |
| 5.30                    | 92.50         | -          |
| 5.30                    | 95.00         | -          |
| 5.30                    | 97.50         | -          |
| <b>5.30</b>             | <b>100.00</b> | -          |
| 5.30                    | 103.00        | -          |
| 5.30                    | 106.00        | -          |
| 5.30                    | 109.00        | -          |
| <b>5.30</b>             | <b>112.00</b> | -          |
| 5.30                    | 115.00        | -          |
| 5.30                    | 118.00        | -          |
| 5.30                    | 122.00        | -          |
| <b>5.30</b>             | <b>125.00</b> | -          |
| 5.30                    | 128.00        | -          |
| 5.30                    | 132.00        | -          |
| 5.30                    | 136.00        | -          |
| <b>5.30</b>             | <b>140.00</b> | -          |
| 5.30                    | 145.00        | -          |
| <b>5.30</b>             | <b>150.00</b> | -          |
| 5.30                    | 155.00        | -          |
| 5.30                    | 160.00        | -          |
| 5.30                    | 165.00        | -          |
| <b>5.30</b>             | <b>170.00</b> | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 5.30                    | 175.00        | -          |
| 5.30                    | 180.00        | -          |
| 5.30                    | 185.00        | -          |
| <b>5.30</b>             | <b>190.00</b> | -          |
| 5.30                    | 195.00        | -          |
| 5.30                    | 200.00        | -          |
| 5.33                    | 74.63         | BS619      |
| 5.33                    | 79.73         | BS620      |
| 5.33                    | 89.69         | BS621      |
| 5.33                    | 100.00        | BS622      |
| 5.33                    | 109.54        | BS623      |
| 5.33                    | 117.48        | BS860      |
| 5.33                    | 120.65        | BS861      |
| 5.33                    | 123.83        | BS862      |
| 5.33                    | 127.00        | BS863      |
| 5.33                    | 130.18        | BS864      |
| 5.33                    | 133.35        | BS865      |
| 5.33                    | 136.53        | BS866      |
| 5.33                    | 139.70        | BS867      |
| 5.33                    | 142.88        | BS868      |
| 5.33                    | 146.05        | BS869      |
| 5.33                    | 149.23        | BS870      |
| 5.33                    | 155.00        | BS644      |
| 5.33                    | 161.30        | BS645      |
| 5.33                    | 167.70        | BS646      |
| 5.33                    | 174.00        | BS647      |
| <b>5.33</b>             | <b>291.69</b> | -          |
| <b>5.33</b>             | <b>491.49</b> | -          |
| 5.33                    | 702.66        | -          |
| 5.50                    | 34.00         | -          |
| 5.50                    | 72.00         | -          |
| 5.50                    | 75.00         | -          |
| 5.50                    | 145.00        | -          |
| 5.70                    | 24.20         | -          |
| 5.70                    | 35.20         | -          |
| 5.70                    | 36.20         | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| 5.70                    | 37.20        | -          |
| 5.70                    | 39.20        | -          |
| 5.70                    | 41.20        | -          |
| 5.70                    | 44.20        | -          |
| <b>5.70</b>             | <b>44.30</b> | -          |
| 5.70                    | 45.20        | -          |
| <b>5.70</b>             | <b>45.30</b> | -          |
| 5.70                    | 47.20        | -          |
| <b>5.70</b>             | <b>47.60</b> | P48A       |
| 5.70                    | 49.20        | -          |
| <b>5.70</b>             | <b>49.30</b> | -          |
| <b>5.70</b>             | <b>49.60</b> | P50A       |
| 5.70                    | 51.20        | -          |
| <b>5.70</b>             | <b>51.60</b> | P52        |
| 5.70                    | 62.20        | -          |
| <b>5.70</b>             | <b>62.30</b> | -          |
| 5.70                    | 52.50        | -          |
| <b>5.70</b>             | <b>52.60</b> | P53        |
| 5.70                    | 53.00        | -          |
| 5.70                    | 54.20        | -          |
| <b>5.70</b>             | <b>54.30</b> | -          |
| <b>5.70</b>             | <b>54.60</b> | P55        |
| 5.70                    | 55.20        | -          |
| <b>5.70</b>             | <b>55.30</b> | -          |
| <b>5.70</b>             | <b>55.60</b> | P56        |
| 5.70                    | 57.20        | -          |
| <b>5.70</b>             | <b>57.60</b> | P58        |
| 5.70                    | 59.20        | -          |
| <b>5.70</b>             | <b>59.30</b> | -          |
| <b>5.70</b>             | <b>59.60</b> | P60        |
| 5.70                    | 59.70        | -          |
| 5.70                    | 61.20        | -          |
| <b>5.70</b>             | <b>61.60</b> | P62        |
| 5.70                    | 62.00        | -          |
| 5.70                    | 62.20        | -          |
| <b>5.70</b>             | <b>62.30</b> | -          |



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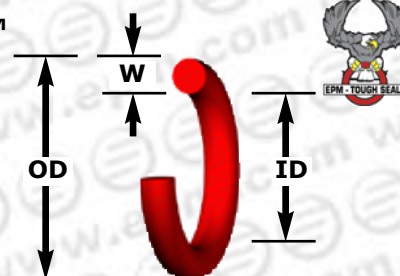
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| <b>5.70</b>             | <b>62.60</b> | P63        |
| 5.70                    | 64.00        | -          |
| 5.70                    | 64.20        | -          |
| <b>5.70</b>             | <b>64.30</b> | -          |
| 5.70                    | 64.60        | P65        |
| <b>5.70</b>             | <b>66.60</b> | P67        |
| 5.70                    | 67.20        | -          |
| <b>5.70</b>             | <b>67.60</b> | P68        |
| 5.70                    | 69.00        | -          |
| <b>5.70</b>             | <b>69.20</b> | -          |
| 5.70                    | 69.30        | -          |
| <b>5.70</b>             | <b>69.60</b> | P70        |
| 5.70                    | 70.20        | -          |
| <b>5.70</b>             | <b>70.60</b> | P71        |
| 5.70                    | 71.20        | -          |
| 5.70                    | 72.20        | -          |
| 5.70                    | 72.30        | -          |
| 5.70                    | 74.00        | -          |
| 5.70                    | 74.20        | -          |
| <b>5.70</b>             | <b>74.30</b> | -          |
| <b>5.70</b>             | <b>74.60</b> | P75        |
| 5.70                    | 77.20        | -          |
| 5.70                    | 79.00        | -          |
| 5.70                    | 79.20        | -          |
| <b>5.70</b>             | <b>79.30</b> | -          |
| <b>5.70</b>             | <b>79.60</b> | P80        |
| 5.70                    | 81.20        | -          |
| 5.70                    | 82.20        | -          |
| 5.70                    | 84.00        | -          |
| 5.70                    | 84.10        | -          |
| 5.70                    | 84.20        | -          |
| <b>5.70</b>             | <b>84.30</b> | -          |
| <b>5.70</b>             | <b>84.60</b> | P85        |
| 5.70                    | 87.20        | -          |
| 5.70                    | 89.00        | -          |
| 5.70                    | 89.10        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 5.70                    | 89.20         | -          |
| <b>5.70</b>             | <b>89.30</b>  | -          |
| <b>5.70</b>             | <b>89.60</b>  | P90        |
| 5.70                    | 92.20         | -          |
| 5.70                    | 94.00         | -          |
| 5.70                    | 94.10         | -          |
| 5.70                    | 94.20         | -          |
| <b>5.70</b>             | <b>94.30</b>  | -          |
| <b>5.70</b>             | <b>94.60</b>  | P95        |
| 5.70                    | 97.20         | -          |
| 5.70                    | 99.00         | -          |
| 5.70                    | 99.10         | -          |
| 5.70                    | 99.20         | -          |
| <b>5.70</b>             | <b>99.30</b>  | -          |
| <b>5.70</b>             | <b>99.60</b>  | P100       |
| <b>5.70</b>             | <b>101.60</b> | P102       |
| 5.70                    | 104.00        | -          |
| 5.70                    | 104.10        | -          |
| 5.70                    | 104.20        | -          |
| <b>5.70</b>             | <b>104.30</b> | -          |
| <b>5.70</b>             | <b>104.60</b> | P105       |
| 5.70                    | 109.00        | -          |
| 5.70                    | 109.10        | -          |
| 5.70                    | 109.20        | -          |
| <b>5.70</b>             | <b>109.30</b> | -          |
| <b>5.70</b>             | <b>109.60</b> | P110       |
| <b>5.70</b>             | <b>111.60</b> | P112       |
| 5.70                    | 114.00        | -          |
| 5.70                    | 114.20        | -          |
| 5.70                    | 114.30        | -          |
| <b>5.70</b>             | <b>114.60</b> | P115       |
| 5.70                    | 119.00        | -          |
| 5.70                    | 119.20        | -          |
| 5.70                    | 119.30        | -          |
| 5.70                    | 119.50        | -          |
| <b>5.70</b>             | <b>119.60</b> | P120       |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 5.70                    | 124.00        | -          |
| <b>5.70</b>             | <b>124.30</b> | -          |
| <b>5.70</b>             | <b>124.60</b> | P125       |
| 5.70                    | 125.30        | -          |
| 5.70                    | 129.20        | -          |
| <b>5.70</b>             | <b>129.30</b> | -          |
| <b>5.70</b>             | <b>129.60</b> | P130       |
| <b>5.70</b>             | <b>131.60</b> | P132       |
| 5.70                    | 132.20        | -          |
| 5.70                    | 133.20        | -          |
| 5.70                    | 134.20        | -          |
| <b>5.70</b>             | <b>134.30</b> | -          |
| <b>5.70</b>             | <b>134.60</b> | P135       |
| 5.70                    | 139.20        | -          |
| <b>5.70</b>             | <b>139.30</b> | -          |
| <b>5.70</b>             | <b>139.60</b> | P140       |
| 5.70                    | 144.20        | -          |
| <b>5.70</b>             | <b>144.30</b> | -          |
| <b>5.70</b>             | <b>144.60</b> | P145       |
| 5.70                    | 149.20        | -          |
| <b>5.70</b>             | <b>149.30</b> | G150       |
| <b>5.70</b>             | <b>149.60</b> | P150       |
| <b>5.70</b>             | <b>154.30</b> | G155       |
| <b>5.70</b>             | <b>159.30</b> | G160       |
| 5.70                    | 164.20        | -          |
| <b>5.70</b>             | <b>164.30</b> | G165       |
| 5.70                    | 168.00        | -          |
| <b>5.70</b>             | <b>169.30</b> | G170       |
| 5.70                    | 174.20        | -          |
| <b>5.70</b>             | <b>174.30</b> | G175       |
| <b>5.70</b>             | <b>179.30</b> | G180       |
| <b>5.70</b>             | <b>184.30</b> | G185       |
| 5.70                    | 189.20        | -          |
| <b>5.70</b>             | <b>189.30</b> | G190       |
| 5.70                    | 194.20        | -          |
| <b>5.70</b>             | <b>194.30</b> | G195       |

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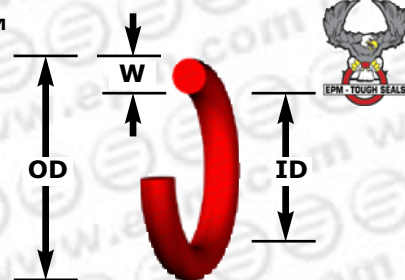
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 5.70                    | 199.20        | -          |
| <b>5.70</b>             | <b>199.30</b> | G200       |
| 5.70                    | 204.20        | -          |
| 5.70                    | 209.20        | -          |
| <b>5.70</b>             | <b>209.30</b> | G210       |
| <b>5.70</b>             | <b>219.30</b> | G220       |
| <b>5.70</b>             | <b>229.30</b> | G230       |
| 5.70                    | 234.30        | -          |
| <b>5.70</b>             | <b>239.30</b> | G240       |
| <b>5.70</b>             | <b>249.30</b> | G250       |
| <b>5.70</b>             | <b>259.30</b> | G260       |
| <b>5.70</b>             | <b>269.30</b> | G270       |
| <b>5.70</b>             | <b>279.30</b> | G280       |
| 5.70                    | 289.20        | -          |
| <b>5.70</b>             | <b>289.30</b> | G290       |
| <b>5.70</b>             | <b>299.30</b> | G300       |
| 5.70                    | 319.30        | -          |
| 5.70                    | 329.30        | -          |
| 5.70                    | 339.30        | -          |
| 5.70                    | 349.30        | -          |
| <b>5.70</b>             | <b>359.30</b> | -          |
| <b>5.70</b>             | <b>379.30</b> | -          |
| 5.70                    | 399.30        | -          |
| 5.70                    | 419.30        | -          |
| <b>5.70</b>             | <b>439.30</b> | -          |
| 5.70                    | 449.20        | -          |
| <b>5.70</b>             | <b>459.30</b> | -          |
| 5.70                    | 479.30        | -          |
| <b>5.70</b>             | <b>499.30</b> | -          |
| 5.70                    | 519.30        | -          |
| 5.70                    | 529.30        | -          |
| 5.70                    | 594.00        | -          |
| 5.70                    | 594.30        | -          |
| 5.70                    | 725.00        | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| 6.00                    | 6.00         | -          |
| 6.00                    | 7.00         | -          |
| 6.00                    | 9.00         | -          |
| 6.00                    | 10.00        | -          |
| 6.00                    | 11.00        | -          |
| 6.00                    | 12.00        | -          |
| 6.00                    | 13.00        | -          |
| 6.00                    | 14.00        | -          |
| 6.00                    | 15.00        | -          |
| 6.00                    | 16.00        | -          |
| 6.00                    | 18.00        | -          |
| 6.00                    | 19.00        | -          |
| 6.00                    | 19.50        | -          |
| <b>6.00</b>             | <b>20.00</b> | -          |
| 6.00                    | 21.00        | -          |
| 6.00                    | 22.00        | -          |
| 6.00                    | 23.00        | -          |
| 6.00                    | 23.50        | -          |
| 6.00                    | 24.00        | -          |
| <b>6.00</b>             | <b>25.00</b> | -          |
| 6.00                    | 26.00        | -          |
| 6.00                    | 27.00        | -          |
| 6.00                    | 28.00        | -          |
| 6.00                    | 29.00        | -          |
| <b>6.00</b>             | <b>30.00</b> | -          |
| 6.00                    | 31.00        | -          |
| 6.00                    | 32.00        | -          |
| 6.00                    | 33.00        | -          |
| 6.00                    | 34.00        | -          |
| 6.00                    | 35.00        | -          |
| 6.00                    | 36.00        | -          |
| 6.00                    | 37.00        | -          |
| 6.00                    | 38.00        | -          |
| 6.00                    | 39.00        | -          |
| 6.00                    | 39.50        | -          |
| 6.00                    | 40.00        | -          |

| Actual O-Ring Size (mm) |              |            |
|-------------------------|--------------|------------|
| Width (mm)              | I.D. (mm)    | Cross Ref. |
| 6.00                    | 41.00        | -          |
| 6.00                    | 41.50        | -          |
| 6.00                    | 42.00        | -          |
| 6.00                    | 43.00        | -          |
| 6.00                    | 44.00        | -          |
| 6.00                    | 44.50        | -          |
| 6.00                    | 45.00        | -          |
| 6.00                    | 46.00        | -          |
| 6.00                    | 47.00        | -          |
| 6.00                    | 48.00        | -          |
| 6.00                    | 49.00        | -          |
| <b>6.00</b>             | <b>50.00</b> | -          |
| 6.00                    | 51.00        | -          |
| 6.00                    | 52.00        | -          |
| 6.00                    | 53.00        | -          |
| 6.00                    | 54.00        | -          |
| 6.00                    | 55.00        | -          |
| 6.00                    | 56.00        | -          |
| 6.00                    | 57.00        | -          |
| 6.00                    | 58.00        | -          |
| 6.00                    | 59.50        | -          |
| 6.00                    | 60.00        | -          |
| 6.00                    | 61.00        | -          |
| 6.00                    | 62.00        | -          |
| 6.00                    | 63.00        | -          |
| 6.00                    | 64.00        | -          |
| 6.00                    | 65.00        | -          |
| 6.00                    | 66.00        | -          |
| 6.00                    | 67.00        | -          |
| 6.00                    | 68.00        | -          |
| 6.00                    | 69.00        | -          |
| 6.00                    | 70.00        | -          |
| 6.00                    | 71.00        | -          |
| 6.00                    | 72.00        | -          |
| 6.00                    | 73.00        | -          |
| 6.00                    | 74.00        | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

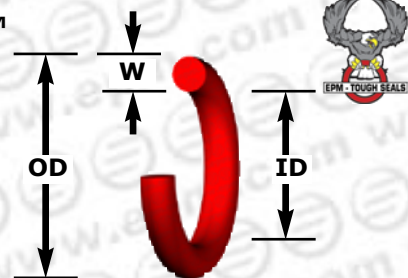
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 6.00                    | 75.00         | -          |
| 6.00                    | 76.00         | -          |
| 6.00                    | 78.00         | -          |
| 6.00                    | 78.50         | -          |
| 6.00                    | 79.00         | -          |
| 6.00                    | 80.00         | -          |
| 6.00                    | 81.00         | -          |
| 6.00                    | 81.50         | -          |
| 6.00                    | 84.00         | -          |
| 6.00                    | 85.00         | -          |
| 6.00                    | 86.00         | -          |
| 6.00                    | 88.00         | -          |
| 6.00                    | 89.00         | -          |
| 6.00                    | 90.00         | -          |
| 6.00                    | 92.00         | -          |
| 6.00                    | 93.00         | -          |
| 6.00                    | 95.00         | -          |
| 6.00                    | 96.00         | -          |
| 6.00                    | 98.00         | -          |
| 6.00                    | 99.00         | -          |
| <b>6.00</b>             | <b>100.00</b> | -          |
| 6.00                    | 101.00        | -          |
| 6.00                    | 103.00        | -          |
| 6.00                    | 104.00        | -          |
| 6.00                    | 104.50        | -          |
| 6.00                    | 105.00        | -          |
| 6.00                    | 106.00        | -          |
| 6.00                    | 108.00        | -          |
| 6.00                    | 110.00        | -          |
| 6.00                    | 111.00        | -          |
| 6.00                    | 112.00        | -          |
| 6.00                    | 114.00        | -          |
| 6.00                    | 115.00        | -          |
| 6.00                    | 118.00        | -          |
| <b>6.00</b>             | <b>120.00</b> | -          |
| 6.00                    | 122.00        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 6.00                    | 123.00        | -          |
| 6.00                    | 124.00        | -          |
| 6.00                    | 125.00        | -          |
| 6.00                    | 126.00        | -          |
| 6.00                    | 128.00        | -          |
| 6.00                    | 130.00        | -          |
| 6.00                    | 132.00        | -          |
| <b>6.00</b>             | <b>134.00</b> | -          |
| 6.00                    | 135.00        | -          |
| 6.00                    | 136.00        | -          |
| 6.00                    | 138.00        | -          |
| 6.00                    | 139.20        | -          |
| 6.00                    | 140.00        | -          |
| 6.00                    | 142.00        | -          |
| 6.00                    | 143.00        | -          |
| 6.00                    | 145.00        | -          |
| 6.00                    | 146.00        | -          |
| 6.00                    | 148.00        | -          |
| 6.00                    | 150.00        | -          |
| 6.00                    | 153.00        | -          |
| 6.00                    | 154.00        | -          |
| 6.00                    | 155.00        | -          |
| 6.00                    | 155.50        | -          |
| 6.00                    | 156.00        | -          |
| 6.00                    | 157.00        | -          |
| 6.00                    | 158.00        | -          |
| 6.00                    | 159.00        | -          |
| <b>6.00</b>             | <b>160.00</b> | -          |
| 6.00                    | 162.00        | -          |
| 6.00                    | 165.00        | -          |
| 6.00                    | 166.00        | -          |
| 6.00                    | 169.00        | -          |
| 6.00                    | 170.00        | -          |
| 6.00                    | 172.00        | -          |
| 6.00                    | 175.00        | -          |
| 6.00                    | 176.00        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 6.00                    | 180.00        | -          |
| 6.00                    | 182.00        | -          |
| 6.00                    | 184.00        | -          |
| 6.00                    | 185.00        | -          |
| 6.00                    | 188.00        | -          |
| 6.00                    | 190.00        | -          |
| 6.00                    | 191.20        | -          |
| 6.00                    | 193.00        | -          |
| 6.00                    | 195.00        | -          |
| 6.00                    | 196.00        | -          |
| 6.00                    | 198.00        | -          |
| 6.00                    | 200.00        | -          |
| 6.00                    | 201.00        | -          |
| 6.00                    | 202.00        | -          |
| 6.00                    | 203.00        | -          |
| 6.00                    | 203.50        | -          |
| 6.00                    | 204.00        | -          |
| 6.00                    | 205.00        | -          |
| 6.00                    | 206.00        | -          |
| 6.00                    | 208.00        | -          |
| 6.00                    | 210.00        | -          |
| 6.00                    | 212.00        | -          |
| 6.00                    | 215.00        | -          |
| 6.00                    | 216.00        | -          |
| 6.00                    | 217.00        | -          |
| 6.00                    | 218.00        | -          |
| 6.00                    | 220.00        | -          |
| 6.00                    | 221.00        | -          |
| <b>6.00</b>             | <b>222.50</b> | V225       |
| 6.00                    | 226.00        | -          |
| 6.00                    | 229.00        | -          |
| 6.00                    | 230.00        | -          |
| 6.00                    | 235.00        | -          |
| 6.00                    | 236.00        | -          |
| 6.00                    | 237.00        | -          |
| 6.00                    | 237.50        | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

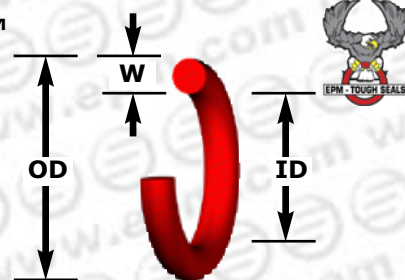
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 6.00                    | 238.00        | -          |
| 6.00                    | 240.00        | -          |
| 6.00                    | 242.00        | -          |
| 6.00                    | 244.00        | -          |
| 6.00                    | 247.00        | -          |
| 6.00                    | 249.00        | -          |
| 6.00                    | 250.00        | -          |
| 6.00                    | 258.00        | -          |
| 6.00                    | 259.00        | -          |
| 6.00                    | 260.00        | -          |
| 6.00                    | 262.00        | -          |
| 6.00                    | 265.00        | -          |
| 6.00                    | 266.00        | -          |
| 6.00                    | 270.00        | -          |
| <b>6.00</b>             | <b>272.00</b> | -          |
| 6.00                    | 278.00        | -          |
| 6.00                    | 280.00        | -          |
| 6.00                    | 284.00        | -          |
| 6.00                    | 285.00        | -          |
| 6.00                    | 288.00        | -          |
| 6.00                    | 290.00        | -          |
| 6.00                    | 294.00        | -          |
| 6.00                    | 295.00        | -          |
| 6.00                    | 300.00        | -          |
| 6.00                    | 301.00        | -          |
| 6.00                    | 305.00        | -          |
| 6.00                    | 310.00        | -          |
| 6.00                    | 311.00        | -          |
| 6.00                    | 315.00        | -          |
| 6.00                    | 320.00        | -          |
| <b>6.00</b>             | <b>321.50</b> | -          |
| 6.00                    | 324.00        | -          |
| 6.00                    | 325.00        | -          |
| 6.00                    | 330.00        | -          |
| 6.00                    | 333.00        | -          |
| 6.00                    | 335.00        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 6.00                    | 338.00        | -          |
| 6.00                    | 340.00        | -          |
| 6.00                    | 345.00        | -          |
| 6.00                    | 347.00        | -          |
| 6.00                    | 348.00        | -          |
| 6.00                    | 350.00        | -          |
| 6.00                    | 355.00        | -          |
| 6.00                    | 358.00        | -          |
| 6.00                    | 360.00        | -          |
| 6.00                    | 365.00        | -          |
| 6.00                    | 368.00        | -          |
| 6.00                    | 370.00        | -          |
| 6.00                    | 375.00        | -          |
| <b>6.00</b>             | <b>376.00</b> | -          |
| 6.00                    | 380.00        | -          |
| 6.00                    | 385.00        | -          |
| 6.00                    | 386.00        | -          |
| 6.00                    | 388.00        | -          |
| 6.00                    | 389.00        | -          |
| 6.00                    | 390.00        | -          |
| 6.00                    | 392.00        | -          |
| 6.00                    | 394.00        | -          |
| 6.00                    | 395.00        | -          |
| 6.00                    | 398.00        | -          |
| 6.00                    | 400.00        | -          |
| 6.00                    | 415.00        | -          |
| 6.00                    | 422.00        | -          |
| <b>6.00</b>             | <b>425.50</b> | V430       |
| 6.00                    | 429.00        | -          |
| 6.00                    | 446.00        | -          |
| 6.00                    | 448.00        | -          |
| 6.00                    | 450.00        | -          |
| 6.00                    | 453.00        | -          |
| 6.00                    | 470.00        | -          |
| 6.00                    | 478.00        | -          |
| 6.00                    | 480.00        | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 6.00                    | 483.00    | -          |
| 6.00                    | 486.00    | -          |
| 6.00                    | 489.00    | -          |
| 6.00                    | 500.00    | -          |
| 6.00                    | 504.00    | -          |
| 6.00                    | 505.00    | -          |
| 6.00                    | 508.00    | -          |
| 6.00                    | 510.00    | -          |
| 6.00                    | 516.00    | -          |
| 6.00                    | 530.00    | -          |
| 6.00                    | 540.00    | -          |
| 6.00                    | 544.00    | -          |
| 6.00                    | 549.00    | -          |
| 6.00                    | 552.00    | -          |
| 6.00                    | 555.00    | -          |
| 6.00                    | 560.00    | -          |
| 6.00                    | 569.00    | -          |
| 6.00                    | 575.00    | -          |
| 6.00                    | 579.00    | -          |
| 6.99                    | 114.70    | BS624      |
| 6.99                    | 124.60    | BS625      |
| 6.99                    | 134.50    | BS626      |
| 6.99                    | 155.60    | BS872      |
| 6.99                    | 159.50    | BS627      |
| 6.99                    | 161.90    | BS874      |
| 6.99                    | 166.70    | BS628      |
| 6.99                    | 168.30    | BS876      |
| 6.99                    | 174.60    | BS878      |
| 6.99                    | 181.00    | BS880      |
| 6.99                    | 187.30    | BS882      |
| 6.99                    | 193.70    | BS884      |
| 6.99                    | 200.00    | BS886      |
| 6.99                    | 208.92    | BS674      |
| 6.99                    | 221.62    | BS676      |
| 6.99                    | 234.32    | BS678      |
| 6.99                    | 247.00    | BS680      |

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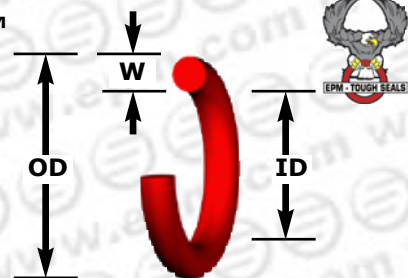
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 6.99                    | 259.70        | BS682      |
| 6.99                    | 272.40        | BS684      |
| 6.99                    | 285.10        | BS686      |
| 6.99                    | 297.80        | BS688      |
| 6.99                    | 310.50        | BS648      |
| 6.99                    | 323.20        | BS649      |
| 6.99                    | 335.90        | BS650      |
| 6.99                    | 675.16        | -          |
| 7.00                    | 12.00         | -          |
| 7.00                    | 54.00         | -          |
| 7.00                    | 60.00         | -          |
| 7.00                    | 70.00         | -          |
| 7.00                    | 75.00         | -          |
| 7.00                    | 82.00         | -          |
| 7.00                    | 90.00         | -          |
| 7.00                    | 95.00         | -          |
| 7.00                    | 105.00        | -          |
| 7.00                    | 110.00        | -          |
| 7.00                    | 192.00        | -          |
| <b>7.00</b>             | <b>206.00</b> | -          |
| 7.00                    | 212.00        | -          |
| 7.00                    | 218.00        | -          |
| 7.00                    | 224.00        | -          |
| 7.00                    | 230.00        | -          |
| <b>7.00</b>             | <b>236.00</b> | -          |
| 7.00                    | 243.00        | -          |
| 7.00                    | 250.00        | -          |
| 7.00                    | 250.37        | -          |
| 7.00                    | 258.00        | -          |
| 7.00                    | 265.00        | -          |
| <b>7.00</b>             | <b>272.00</b> | -          |
| 7.00                    | 280.00        | -          |
| 7.00                    | 290.00        | -          |
| 7.00                    | 300.00        | -          |
| 7.00                    | 307.00        | -          |
| 7.00                    | 315.00        | -          |

| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| <b>7.00</b>             | <b>325.00</b> | -          |
| 7.00                    | 335.00        | -          |
| 7.00                    | 345.00        | -          |
| 7.00                    | 355.00        | -          |
| 7.00                    | 360.00        | -          |
| <b>7.00</b>             | <b>365.00</b> | -          |
| 7.00                    | 375.00        | -          |
| 7.00                    | 387.00        | -          |
| 7.00                    | 400.00        | -          |
| 7.00                    | 412.00        | -          |
| <b>7.00</b>             | <b>425.00</b> | -          |
| 7.00                    | 437.00        | -          |
| 7.00                    | 450.00        | -          |
| 7.00                    | 457.20        | -          |
| 7.00                    | 462.00        | -          |
| <b>7.00</b>             | <b>475.00</b> | -          |
| 7.00                    | 487.00        | -          |
| 7.00                    | 490.00        | -          |
| 7.00                    | 494.67        | -          |
| 7.00                    | 500.00        | -          |
| 7.00                    | 515.00        | -          |
| 7.00                    | 530.00        | -          |
| 7.00                    | 545.00        | -          |
| 7.00                    | 545.47        | -          |
| 7.00                    | 560.00        | -          |
| 7.00                    | 580.00        | -          |
| 7.00                    | 596.27        | -          |
| 7.00                    | 600.00        | -          |
| 7.00                    | 615.00        | -          |
| 7.00                    | 630.00        | -          |
| 7.00                    | 647.07        | -          |
| 7.00                    | 650.00        | -          |
| 7.00                    | 670.00        | -          |
| 7.00                    | 699.00        | -          |
| 7.00                    | 724.00        | -          |
| 7.00                    | 730.50        | -          |

| Actual O-Ring Size (mm) |           |            |
|-------------------------|-----------|------------|
| Width (mm)              | I.D. (mm) | Cross Ref. |
| 7.00                    | 745.00    | -          |
| 7.00                    | 760.00    | -          |
| 7.00                    | 880.00    | -          |
| 7.50                    | 75.00     | -          |
| 8.00                    | 25.00     | -          |
| 8.00                    | 42.00     | -          |
| 8.00                    | 57.00     | -          |
| 8.00                    | 60.00     | -          |
| 8.00                    | 97.00     | -          |
| 8.00                    | 100.00    | -          |
| 8.00                    | 108.00    | -          |
| 8.00                    | 114.00    | -          |
| 8.00                    | 150.00    | -          |
| 8.00                    | 160.00    | -          |
| 8.00                    | 180.00    | -          |
| 8.00                    | 195.00    | -          |
| 8.00                    | 216.00    | -          |
| 8.00                    | 226.00    | -          |
| 8.00                    | 230.00    | -          |
| 8.00                    | 240.00    | -          |
| 8.00                    | 242.00    | -          |
| 8.00                    | 260.00    | -          |
| 8.00                    | 265.00    | -          |
| 8.00                    | 280.00    | -          |
| 8.00                    | 310.00    | -          |
| 8.00                    | 326.00    | -          |
| 8.00                    | 330.00    | -          |
| 8.00                    | 350.00    | -          |
| 8.00                    | 360.00    | -          |
| 8.00                    | 400.00    | -          |
| 8.00                    | 425.00    | -          |
| 8.00                    | 450.00    | -          |
| 8.00                    | 460.00    | -          |
| 8.00                    | 490.00    | -          |
| 8.00                    | 500.00    | -          |
| 8.00                    | 520.00    | -          |

**EPM can make ANY size O-Ring. If the size you need is not listed simply contact your EPM Customer Helper.**

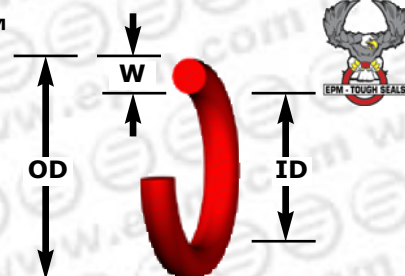
**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

**METRIC**

**SIZING CHART** (continued)



For [Groove Dimensions](#) see [pages 109-113](#).



| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| 8.00                    | 630.00        | -          |
| 8.00                    | 638.00        | -          |
| 8.00                    | 800.00        | -          |
| <b>8.40</b>             | <b>144.10</b> | -          |
| <b>8.40</b>             | <b>149.10</b> | -          |
| <b>8.40</b>             | <b>149.50</b> | P150A      |
| 8.40                    | 154.10        | -          |
| <b>8.40</b>             | <b>154.50</b> | P155       |
| 8.40                    | 159.10        | -          |
| <b>8.40</b>             | <b>159.50</b> | P160       |
| 8.40                    | 164.10        | -          |
| <b>8.40</b>             | <b>164.50</b> | P165       |
| 8.40                    | 169.10        | -          |
| <b>8.40</b>             | <b>169.50</b> | P170       |
| 8.40                    | 174.10        | -          |
| <b>8.40</b>             | <b>174.50</b> | P175       |
| 8.40                    | 179.10        | -          |
| <b>8.40</b>             | <b>179.50</b> | P180       |
| 8.40                    | 184.10        | -          |
| <b>8.40</b>             | <b>184.50</b> | P185       |
| 8.40                    | 189.10        | -          |
| <b>8.40</b>             | <b>189.50</b> | P190       |
| 8.40                    | 194.10        | -          |
| <b>8.40</b>             | <b>194.50</b> | P195       |
| 8.40                    | 194.10        | -          |
| <b>8.40</b>             | <b>199.50</b> | P200       |
| 8.40                    | 204.10        | -          |
| <b>8.40</b>             | <b>204.50</b> | P205       |
| <b>8.40</b>             | <b>208.50</b> | P209       |
| 8.40                    | 209.10        | -          |
| <b>8.40</b>             | <b>209.50</b> | P210       |
| <b>8.40</b>             | <b>214.50</b> | P215       |
| 8.40                    | 219.10        | -          |
| <b>8.40</b>             | <b>219.50</b> | P220       |
| <b>8.40</b>             | <b>224.50</b> | P225       |
| 8.40                    | 229.10        | -          |

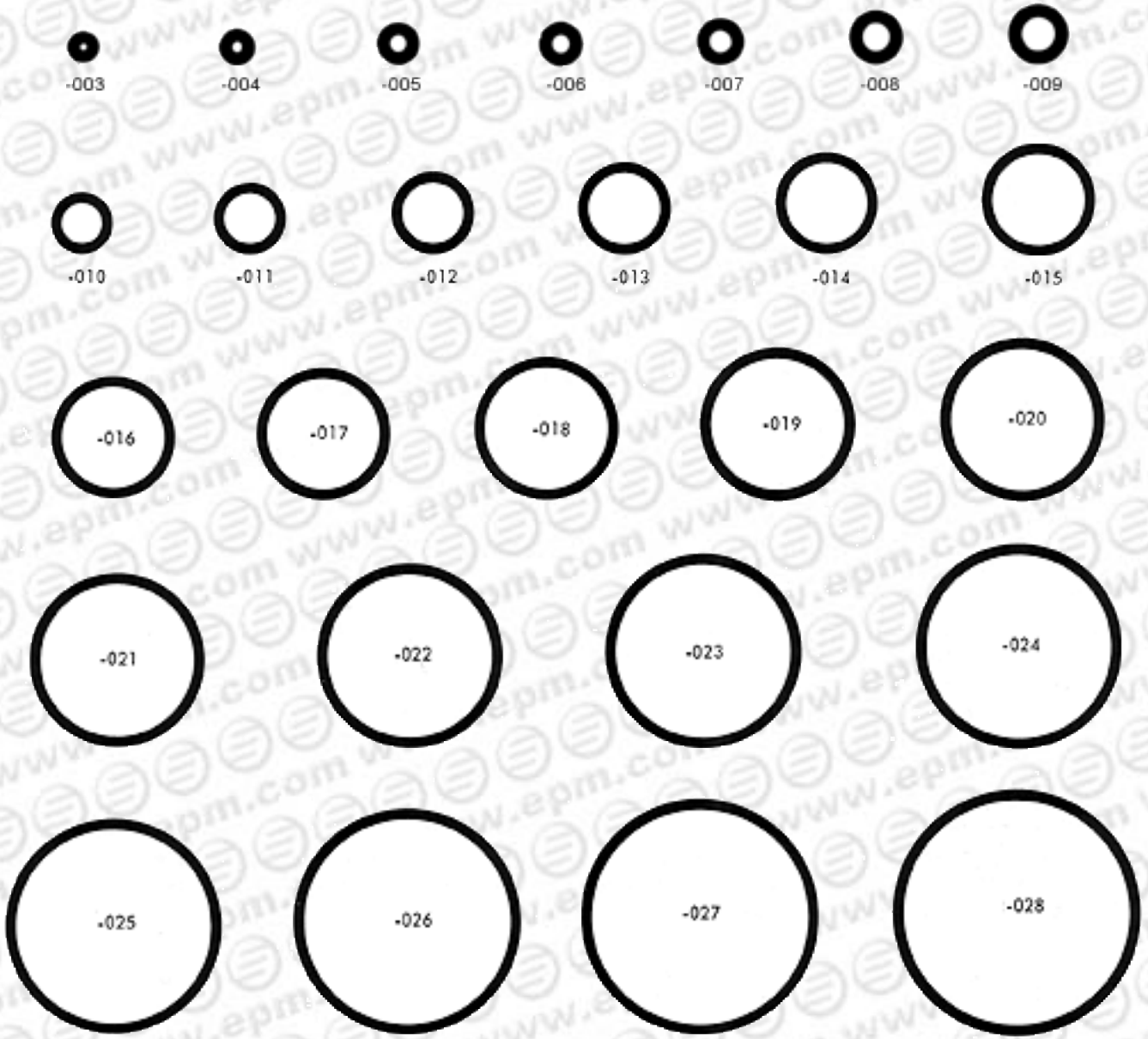
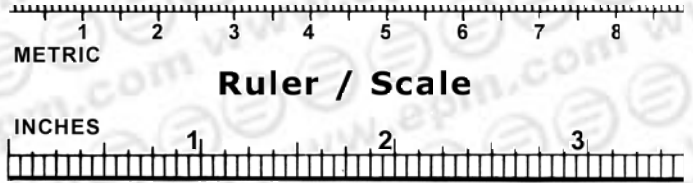
| Actual O-Ring Size (mm) |               |            |
|-------------------------|---------------|------------|
| Width (mm)              | I.D. (mm)     | Cross Ref. |
| <b>8.40</b>             | <b>229.50</b> | P230       |
| 8.40                    | 234.10        | -          |
| <b>8.40</b>             | <b>234.50</b> | P235       |
| 8.40                    | 239.10        | -          |
| <b>8.40</b>             | <b>239.50</b> | P240       |
| <b>8.40</b>             | <b>244.50</b> | P245       |
| 8.40                    | 249.10        | -          |
| <b>8.40</b>             | <b>249.50</b> | P250       |
| <b>8.40</b>             | <b>254.50</b> | P255       |
| <b>8.40</b>             | <b>259.50</b> | P260       |
| <b>8.40</b>             | <b>264.50</b> | P265       |
| <b>8.40</b>             | <b>269.50</b> | P270       |
| <b>8.40</b>             | <b>274.50</b> | P275       |
| <b>8.40</b>             | <b>279.50</b> | P280       |
| <b>8.40</b>             | <b>284.50</b> | P285       |
| <b>8.40</b>             | <b>289.50</b> | P290       |
| <b>8.40</b>             | <b>294.50</b> | P295       |
| <b>8.40</b>             | <b>299.50</b> | P300       |
| 8.40                    | 304.00        | -          |
| <b>8.40</b>             | <b>314.50</b> | P315       |
| <b>8.40</b>             | <b>319.50</b> | P320       |
| <b>8.40</b>             | <b>334.50</b> | P335       |
| <b>8.40</b>             | <b>339.50</b> | P340       |
| <b>8.40</b>             | <b>345.50</b> | P355       |
| <b>8.40</b>             | <b>359.50</b> | P360       |
| <b>8.40</b>             | <b>374.50</b> | P375       |
| 8.40                    | 375.00        | -          |
| <b>8.40</b>             | <b>384.50</b> | P3885      |
| <b>8.40</b>             | <b>399.50</b> | P400       |
| 9.00                    | 75.00         | -          |
| 9.00                    | 84.00         | -          |
| 9.00                    | 205.00        | -          |
| 9.00                    | 316.00        | -          |
| 9.00                    | 335.00        | -          |
| 9.00                    | 360.00        | -          |
| 9.00                    | 402.00        | -          |

| Actual O-Ring Size (mm) |                |            |
|-------------------------|----------------|------------|
| Width (mm)              | I.D. (mm)      | Cross Ref. |
| 9.00                    | 451.00         | -          |
| 9.00                    | 480.00         | -          |
| 9.00                    | 545.00         | -          |
| 10.00                   | 35.00          | -          |
| 10.00                   | 38.00          | -          |
| 10.00                   | 92.00          | -          |
| 10.00                   | 105.00         | -          |
| 10.00                   | 120.00         | -          |
| 10.00                   | 140.00         | -          |
| 10.00                   | 160.00         | -          |
| 10.00                   | 195.00         | -          |
| 10.00                   | 205.00         | -          |
| 10.00                   | 228.00         | -          |
| 10.00                   | 264.00         | -          |
| 10.00                   | 270.00         | -          |
| 10.00                   | 280.00         | -          |
| 10.00                   | 292.00         | -          |
| 10.00                   | 300.00         | -          |
| 10.00                   | 315.00         | -          |
| 10.00                   | 325.00         | -          |
| 10.00                   | 330.00         | -          |
| 10.00                   | 340.00         | -          |
| 10.00                   | 360.00         | -          |
| 10.00                   | 380.00         | -          |
| 10.00                   | 450.00         | -          |
| <b>10.00</b>            | <b>475.00</b>  | V480       |
| <b>10.00</b>            | <b>524.50</b>  | V530       |
| <b>10.00</b>            | <b>579.00</b>  | V585       |
| <b>10.00</b>            | <b>633.50</b>  | V640       |
| <b>10.00</b>            | <b>683.00</b>  | V690       |
| <b>10.00</b>            | <b>700.00</b>  | -          |
| <b>10.00</b>            | <b>732.50</b>  | V740       |
| <b>10.00</b>            | <b>782.00</b>  | V790       |
| <b>10.00</b>            | <b>836.50</b>  | V845       |
| <b>10.00</b>            | <b>1044.00</b> | V1055      |



**Shadow Graphs - 1/16" Width**

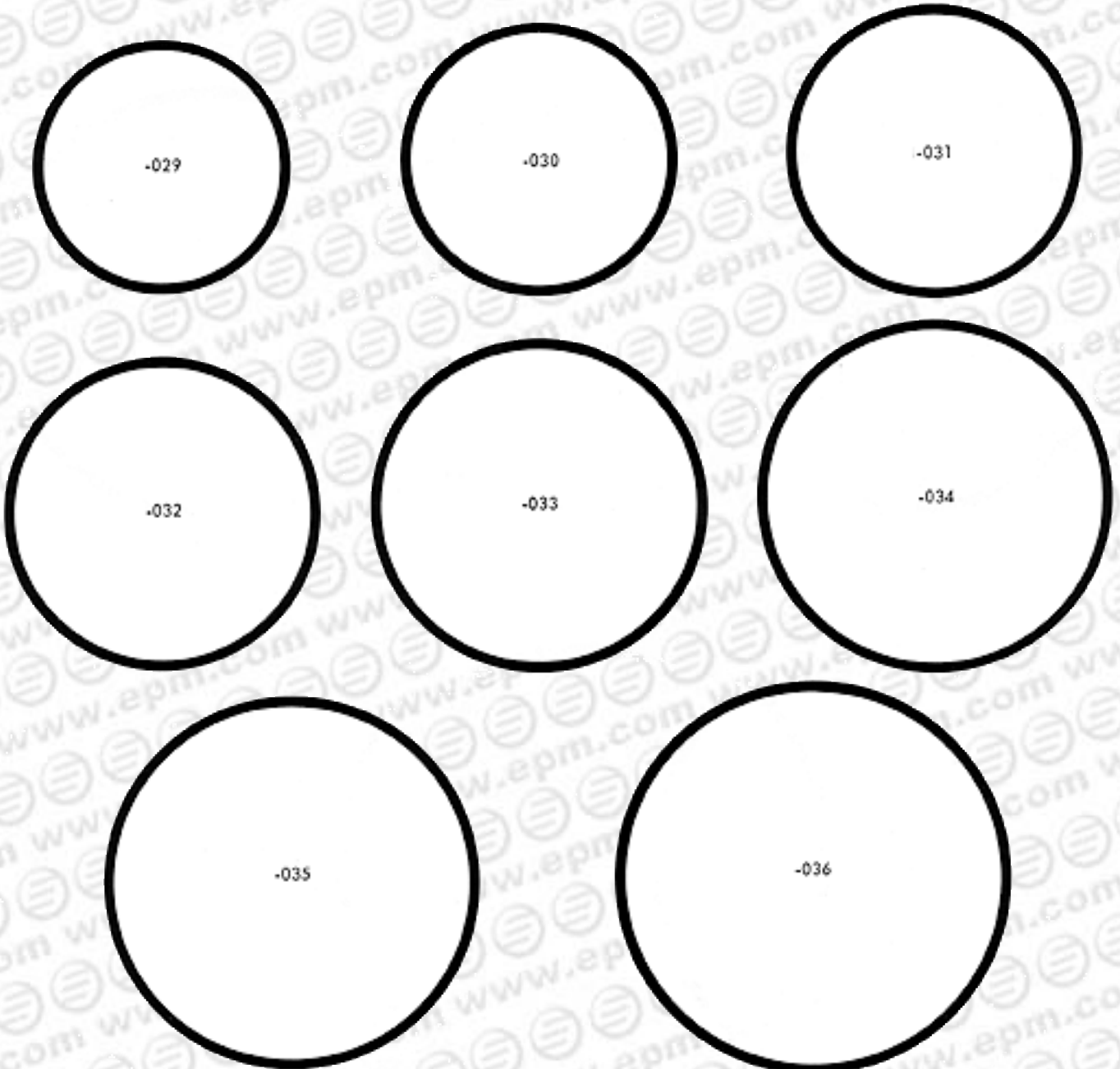
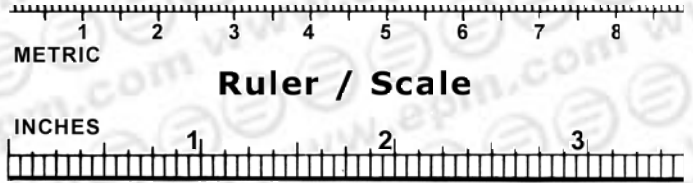
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 1/16" Width

To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.

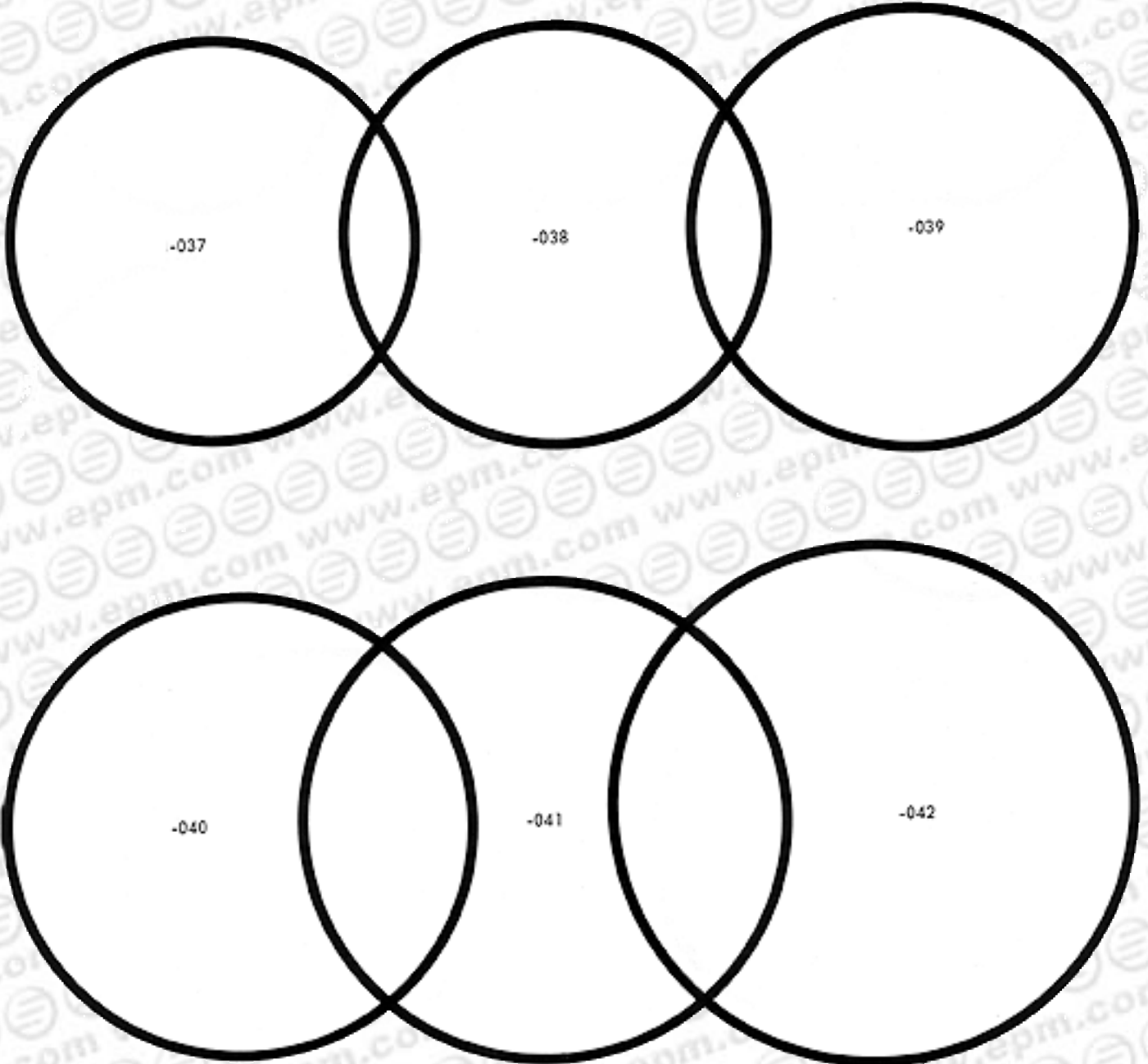
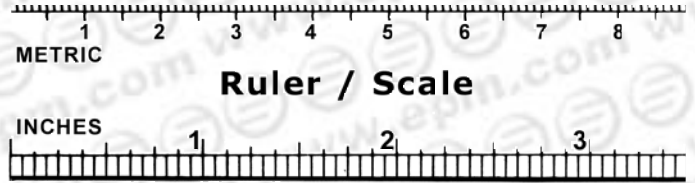






### Shadow Graphs - 1/16" Width

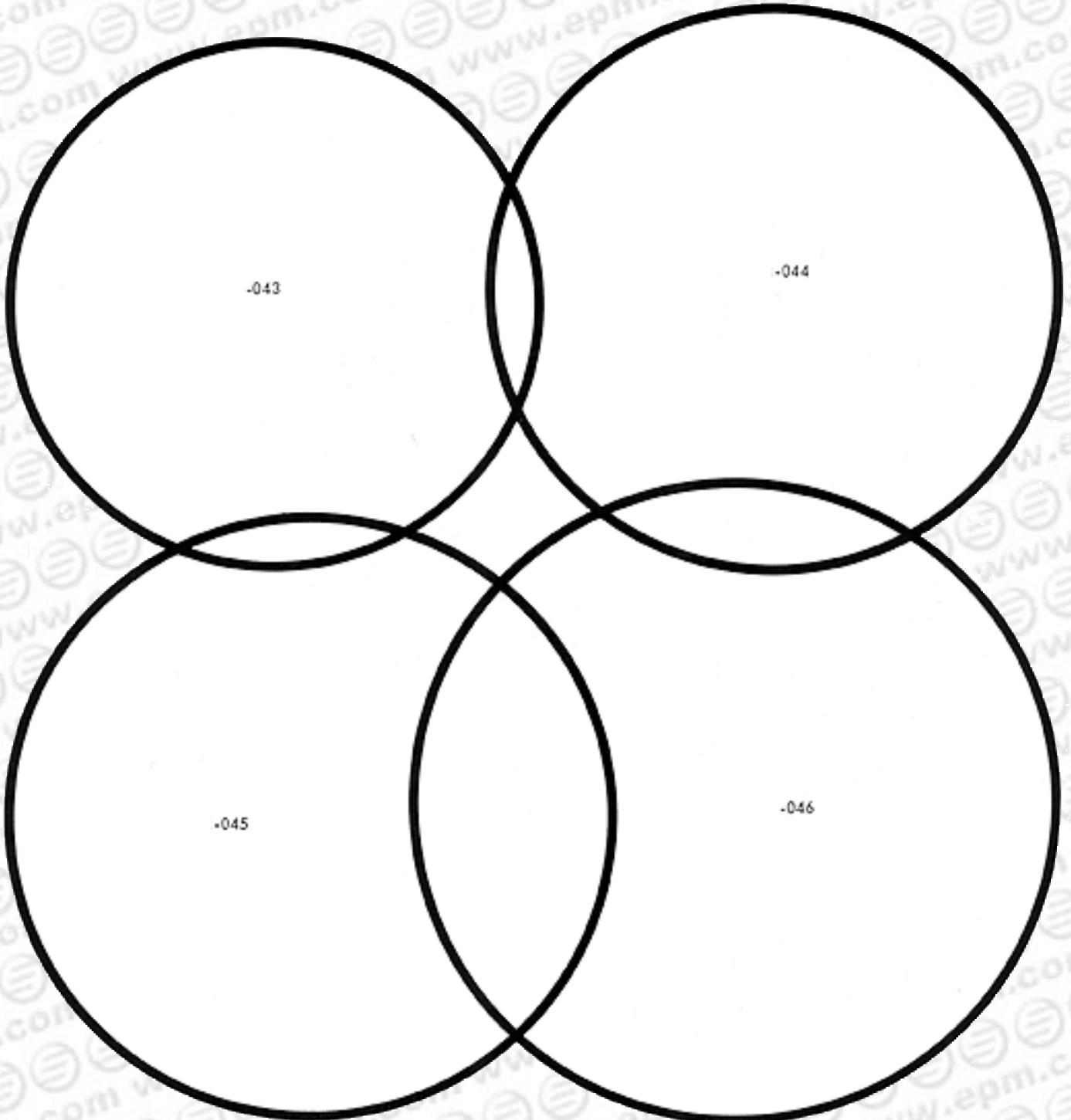
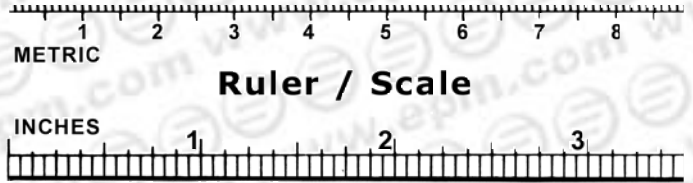
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 1/16" Width

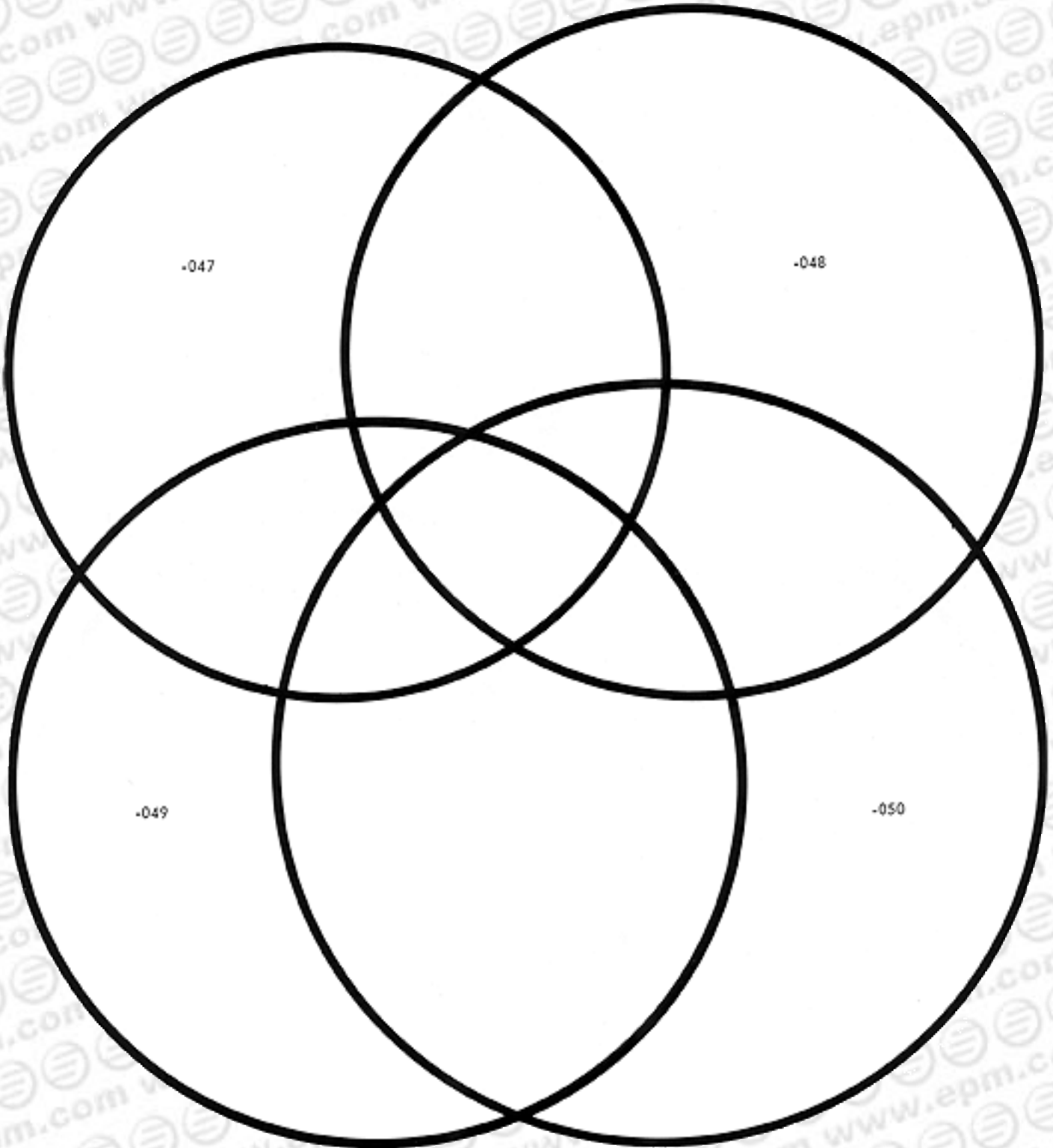
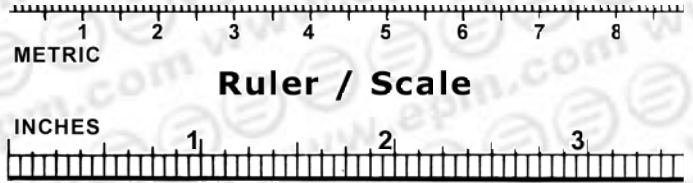
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 1/16" Width

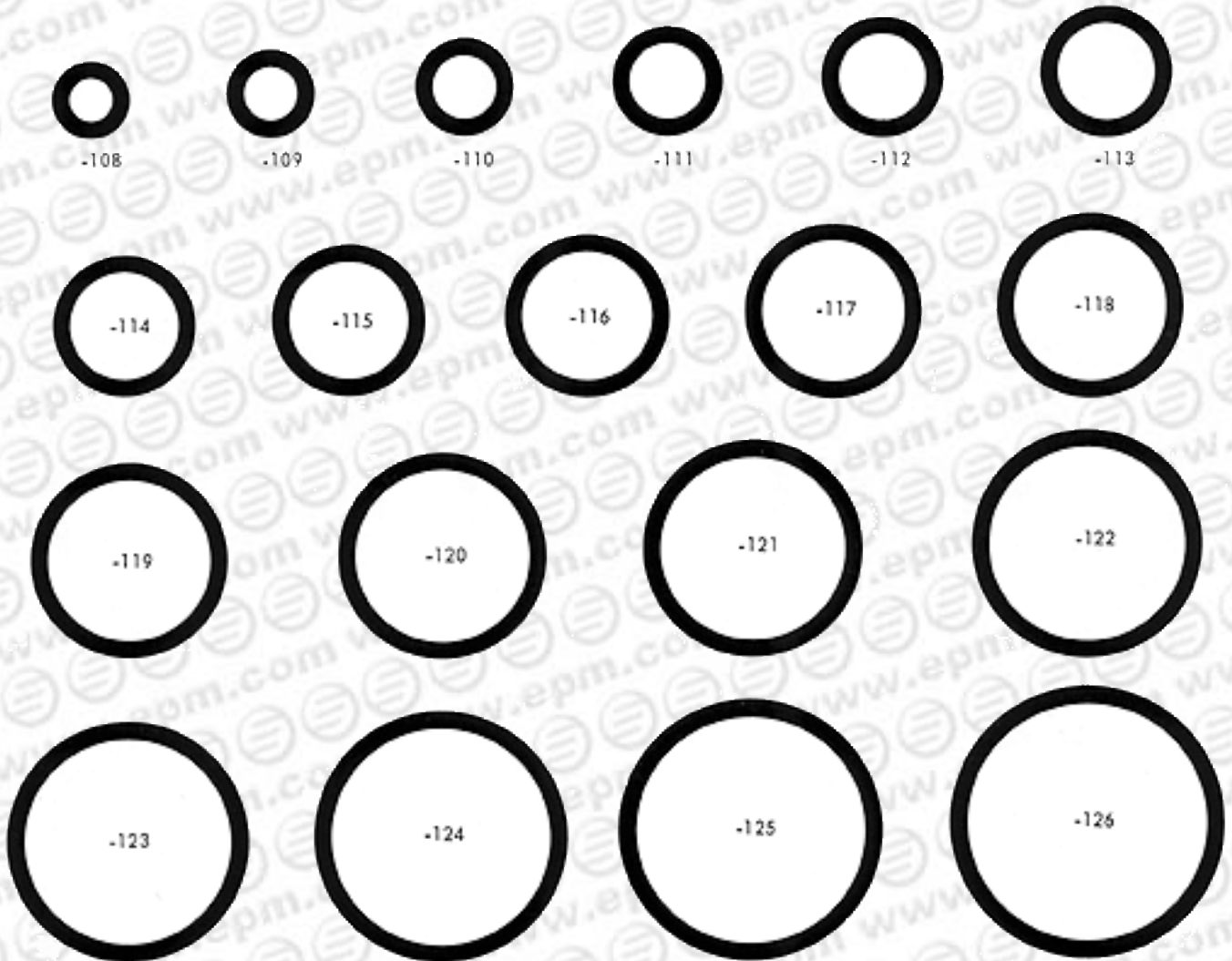
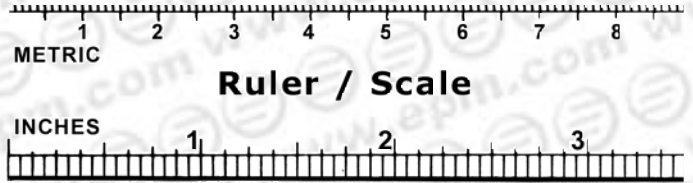
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 3/32" Width

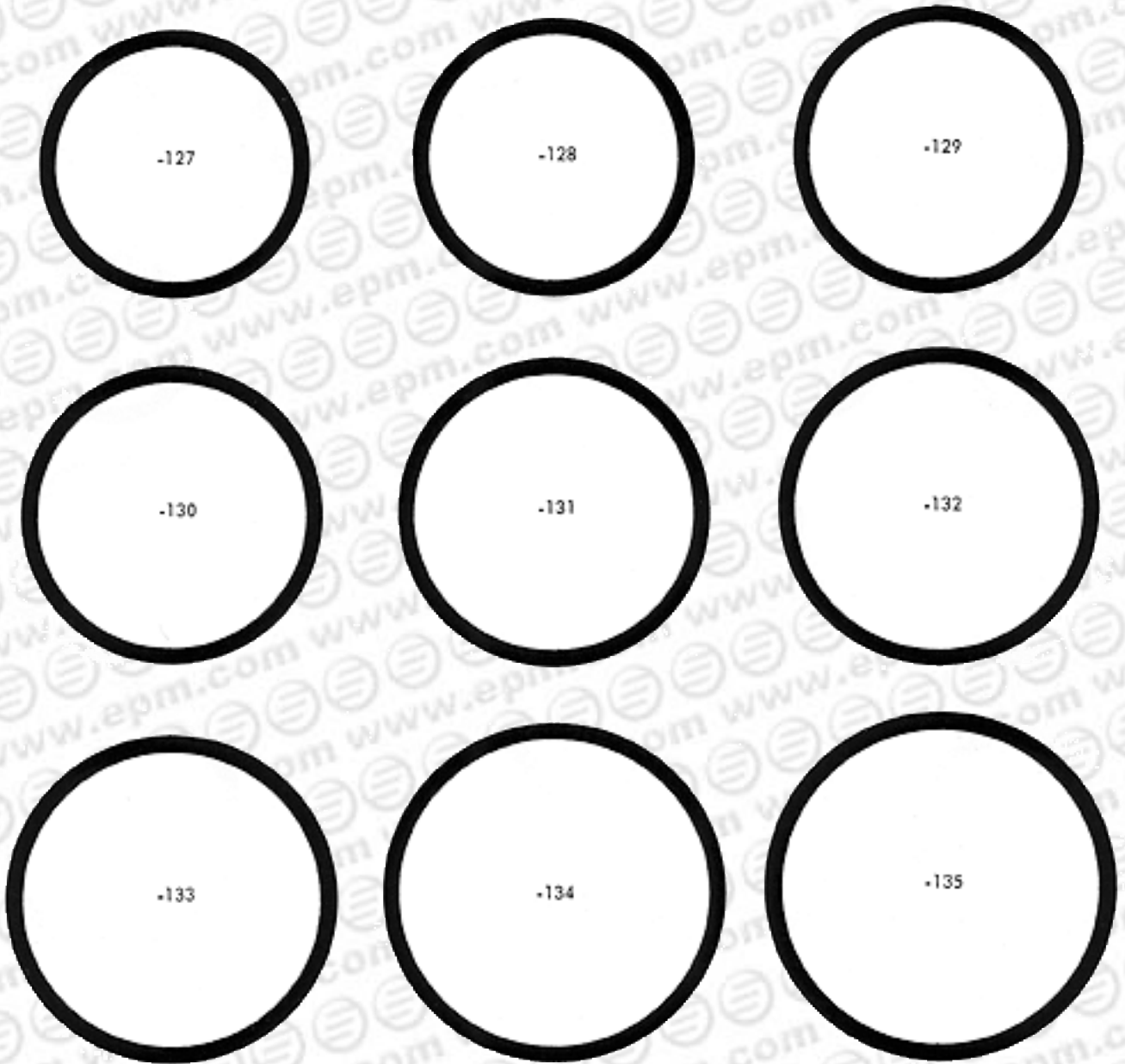
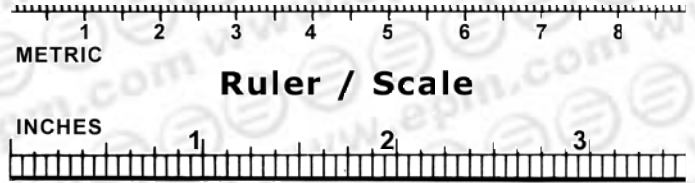
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





## Shadow Graphs - 3/32" Width

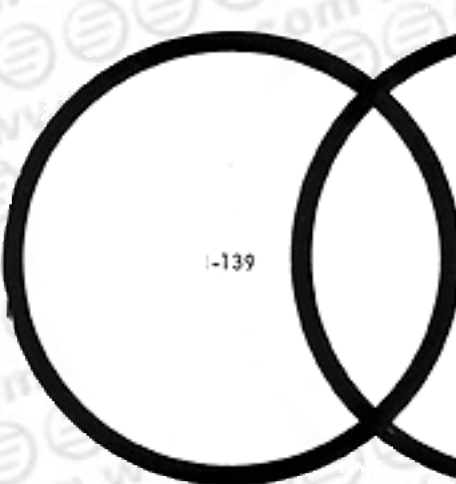
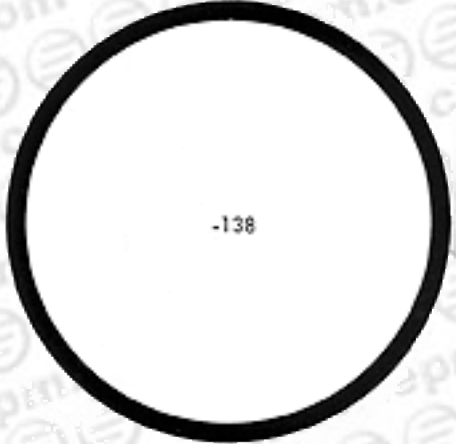
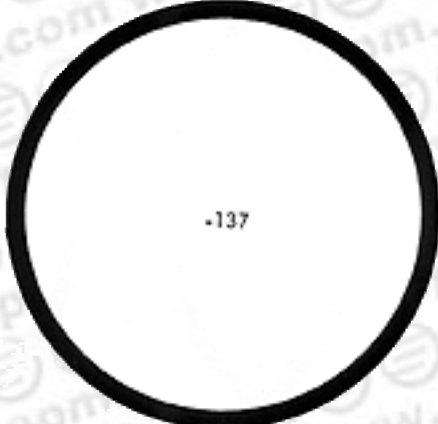
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 3/32" Width

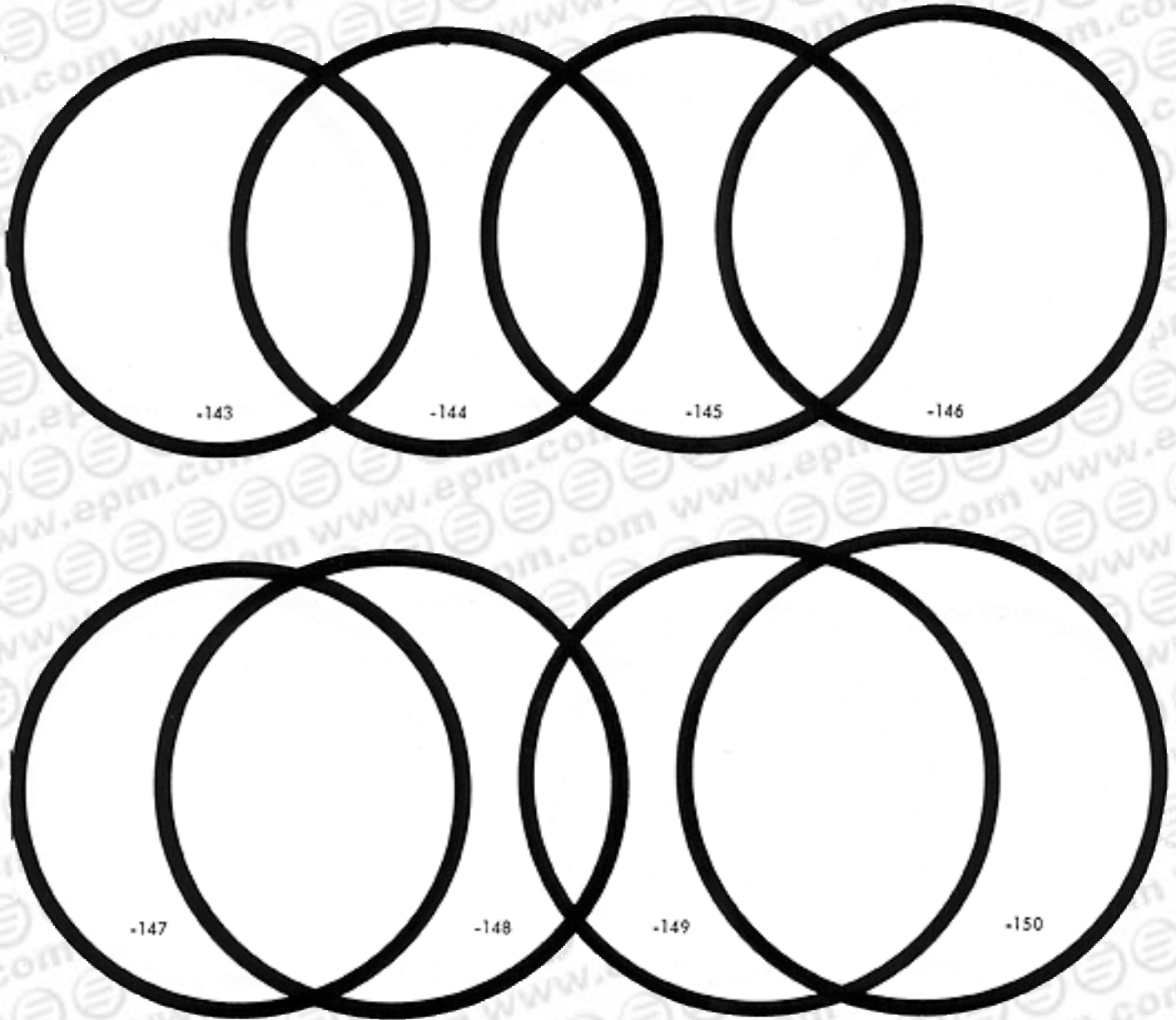
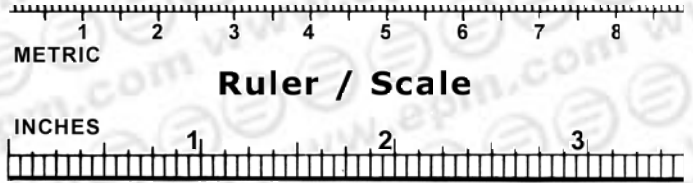
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 3/32" Width

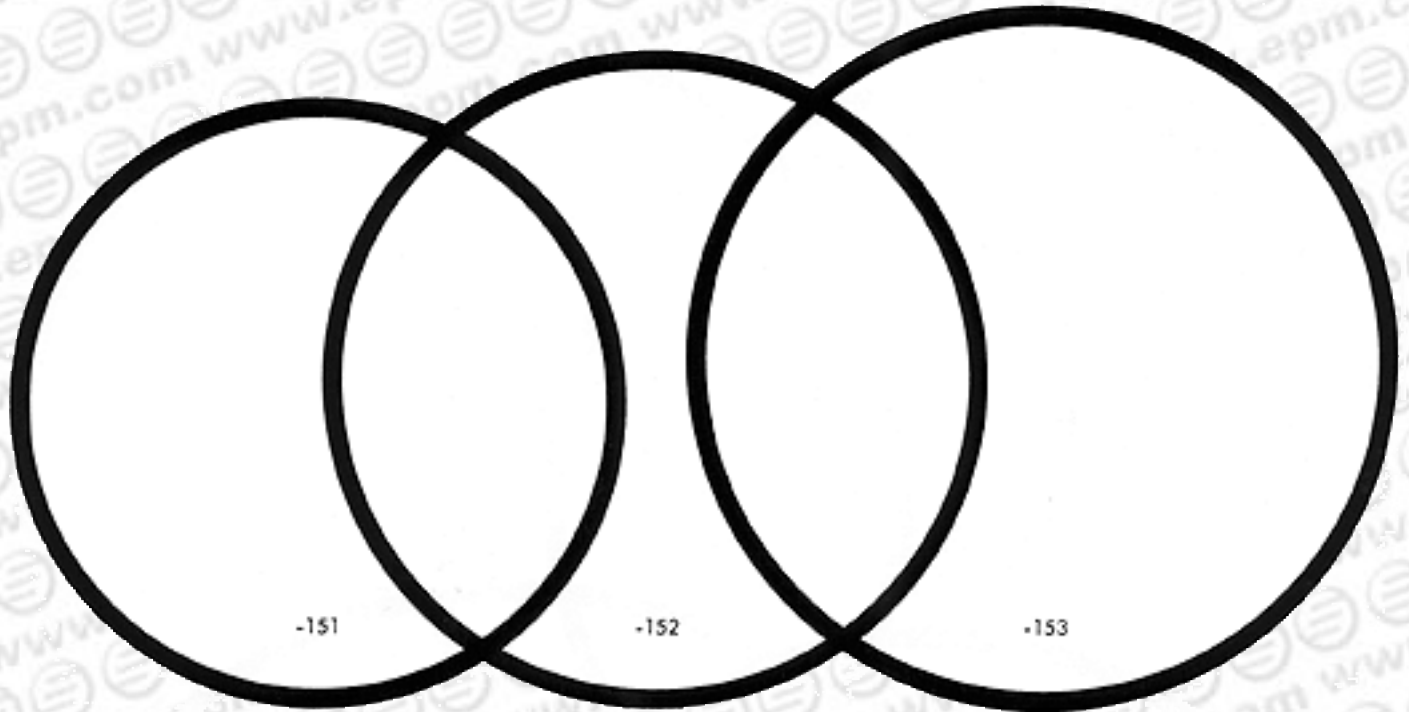
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 3/32" Width

To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.

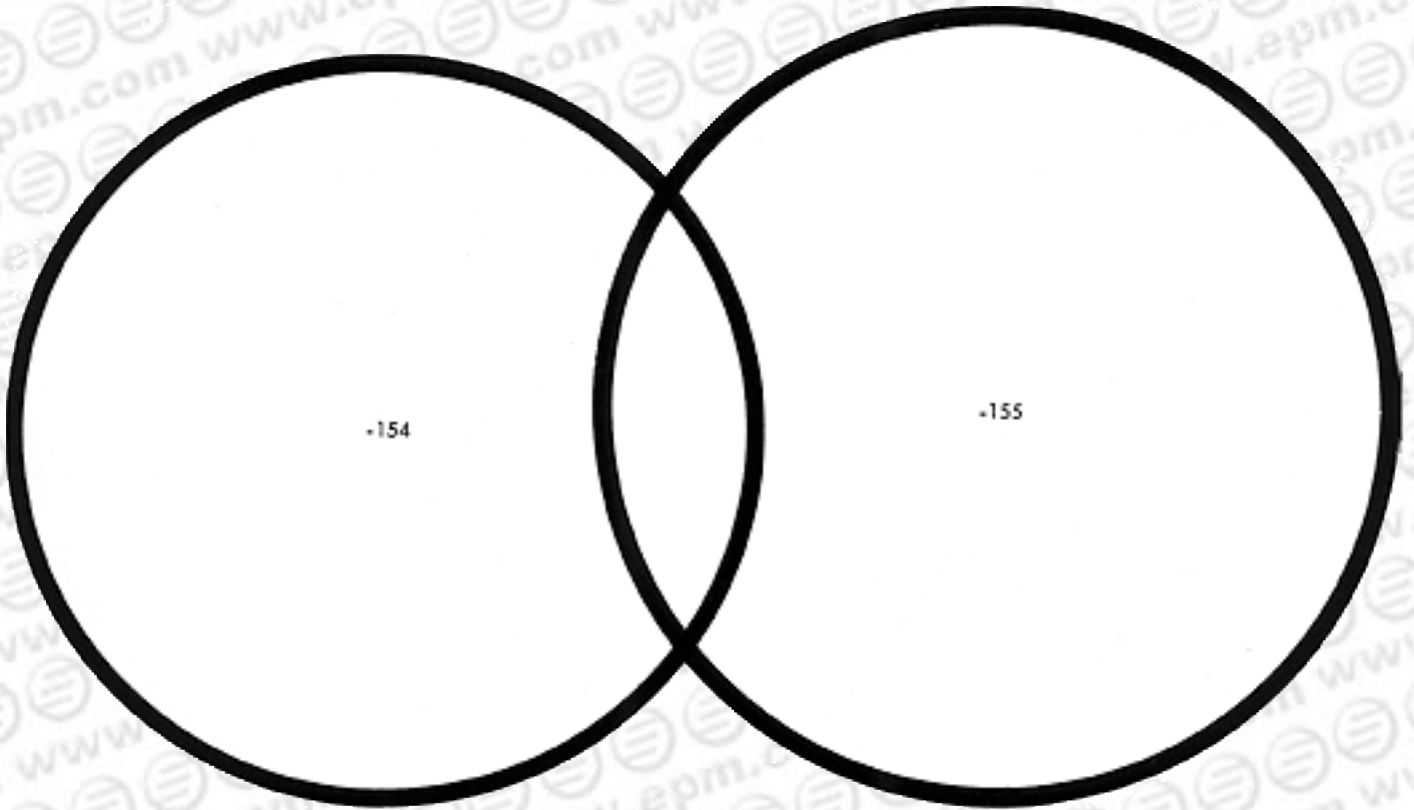
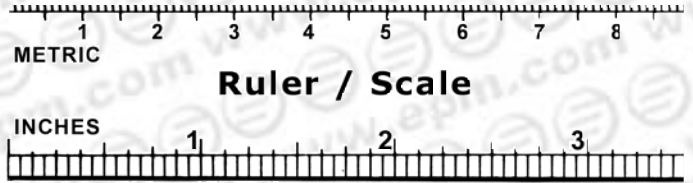






### Shadow Graphs - 3/32" Width

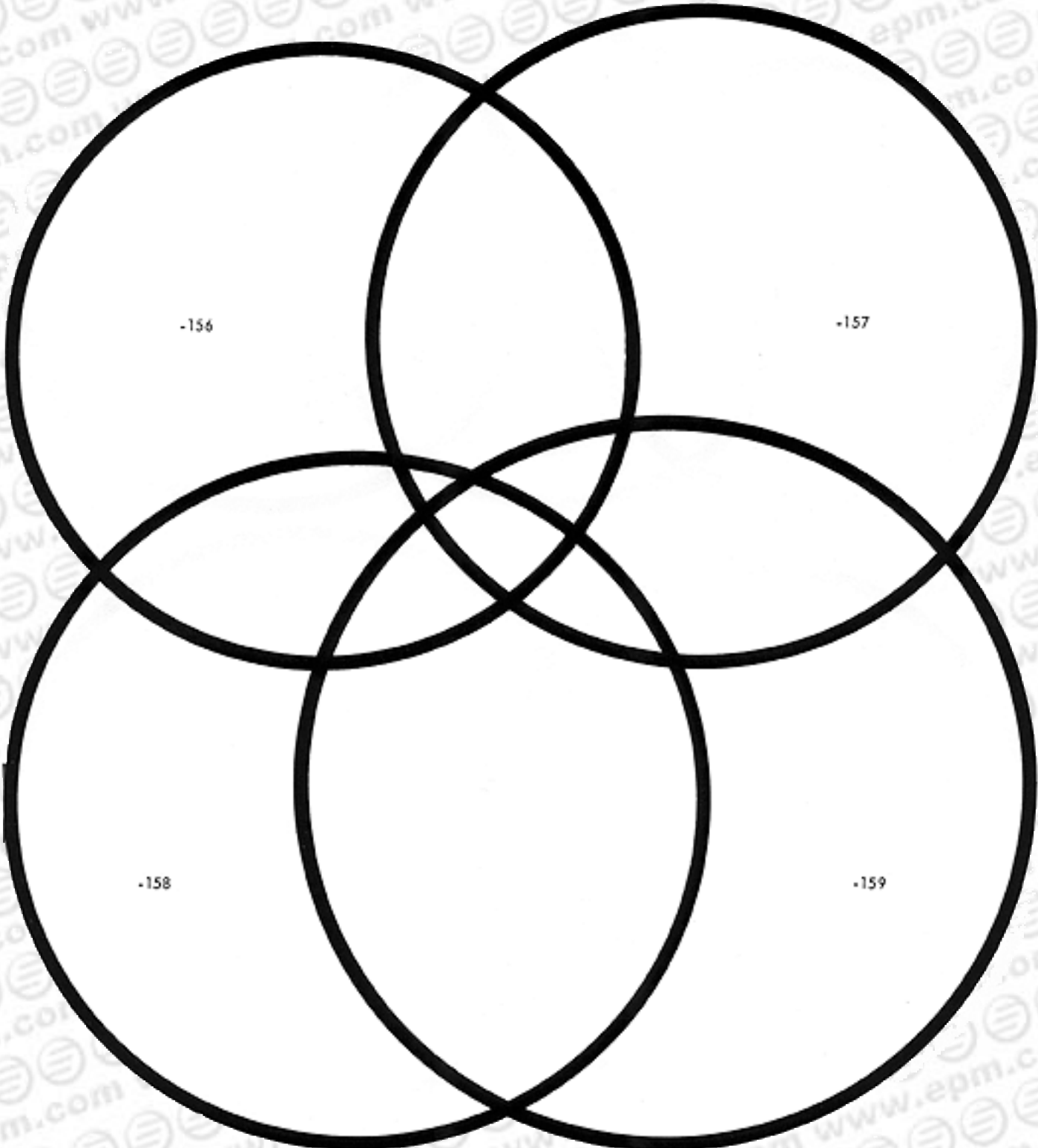
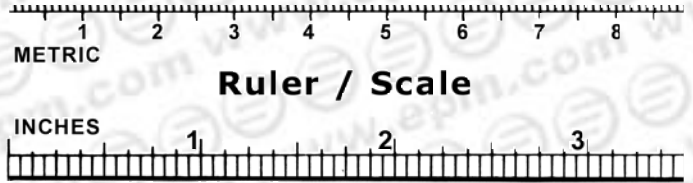
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 3/32" Width

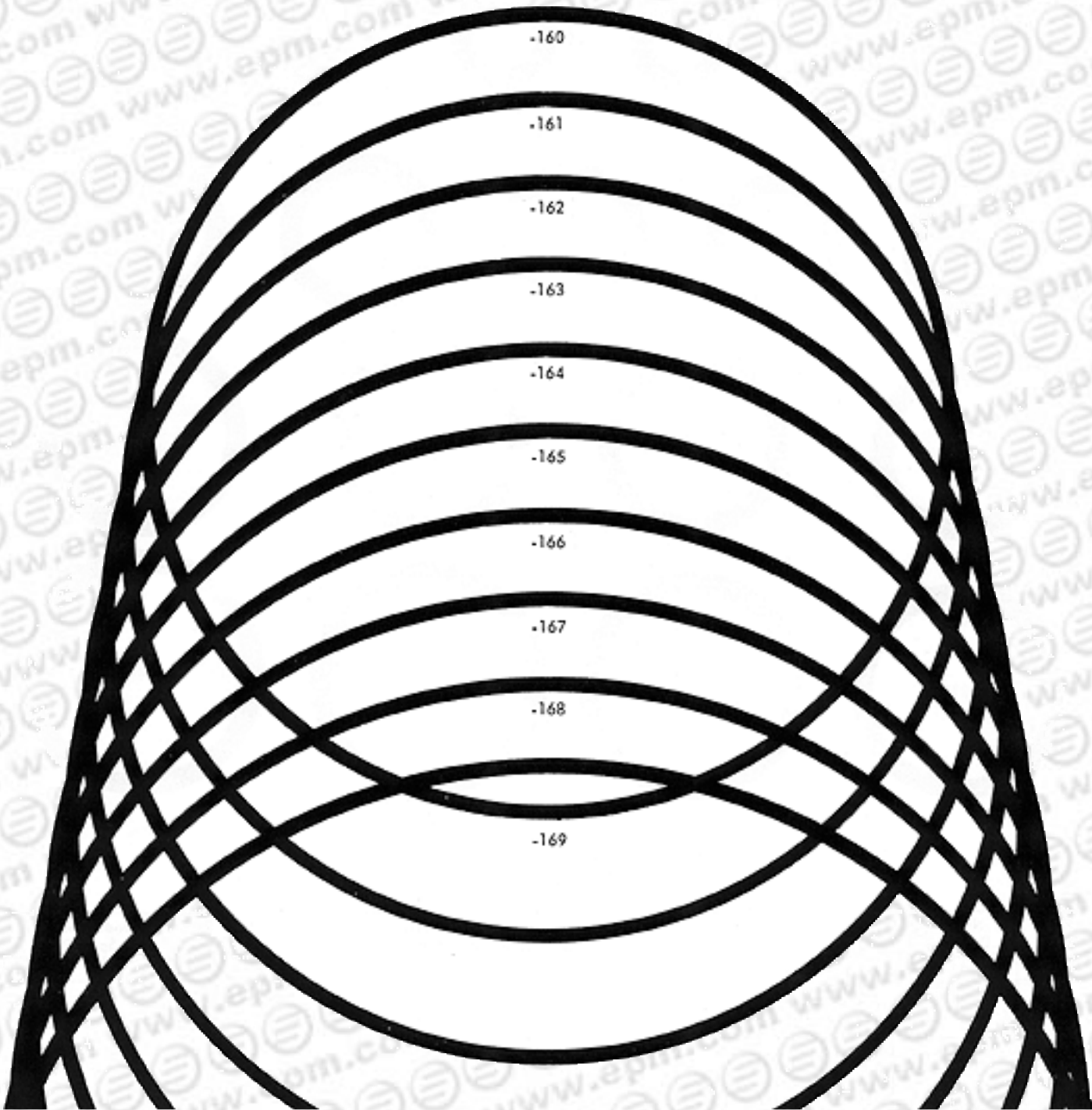
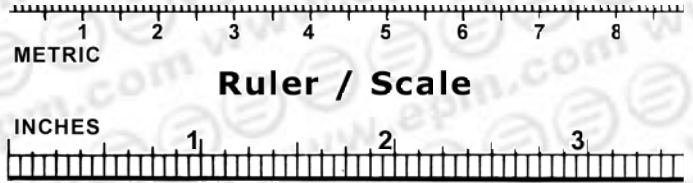
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 3/32" Width

To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.

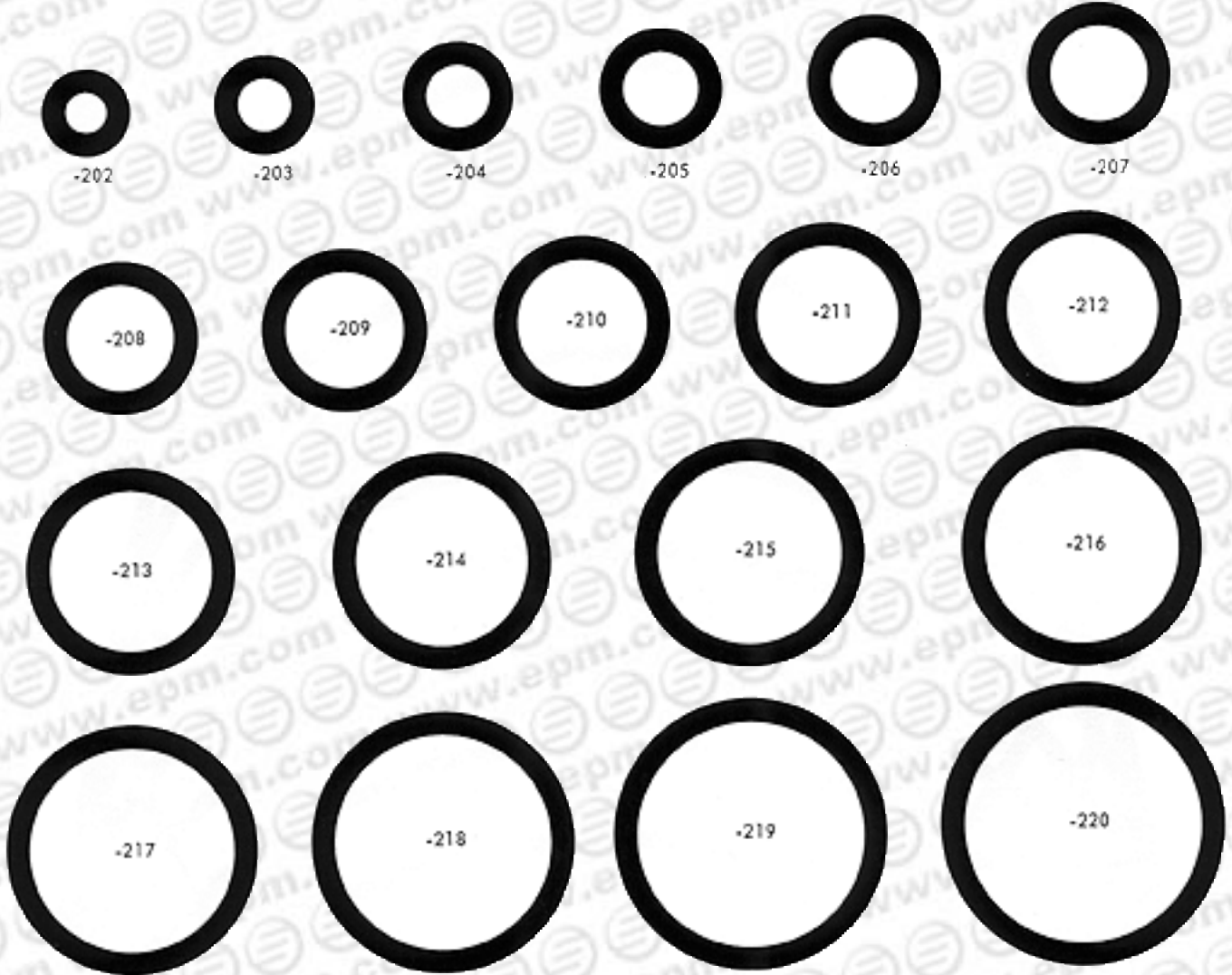


\*Note: These larger O-Rings are not able to fit in whole on a letter-sized page. If you need help identifying your O-Ring, then contact your EPM Customer Helper for further assistance.



**Shadow Graphs - 1/8" Width**

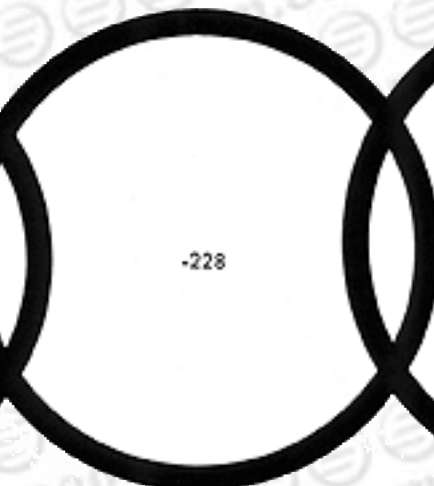
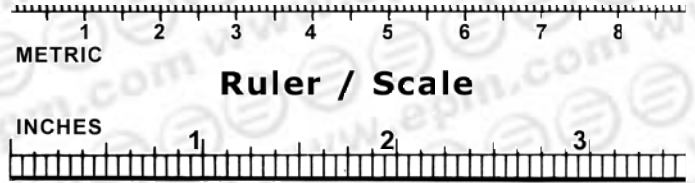
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 1/8" Width

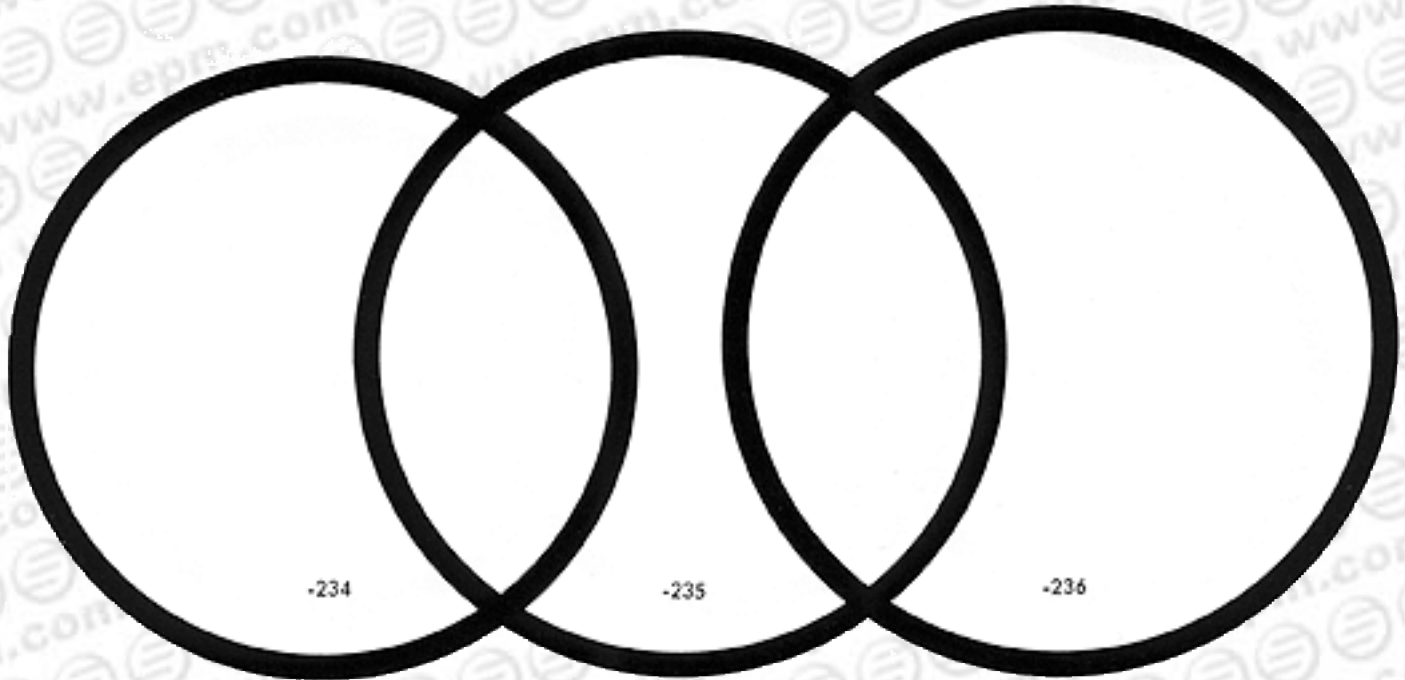
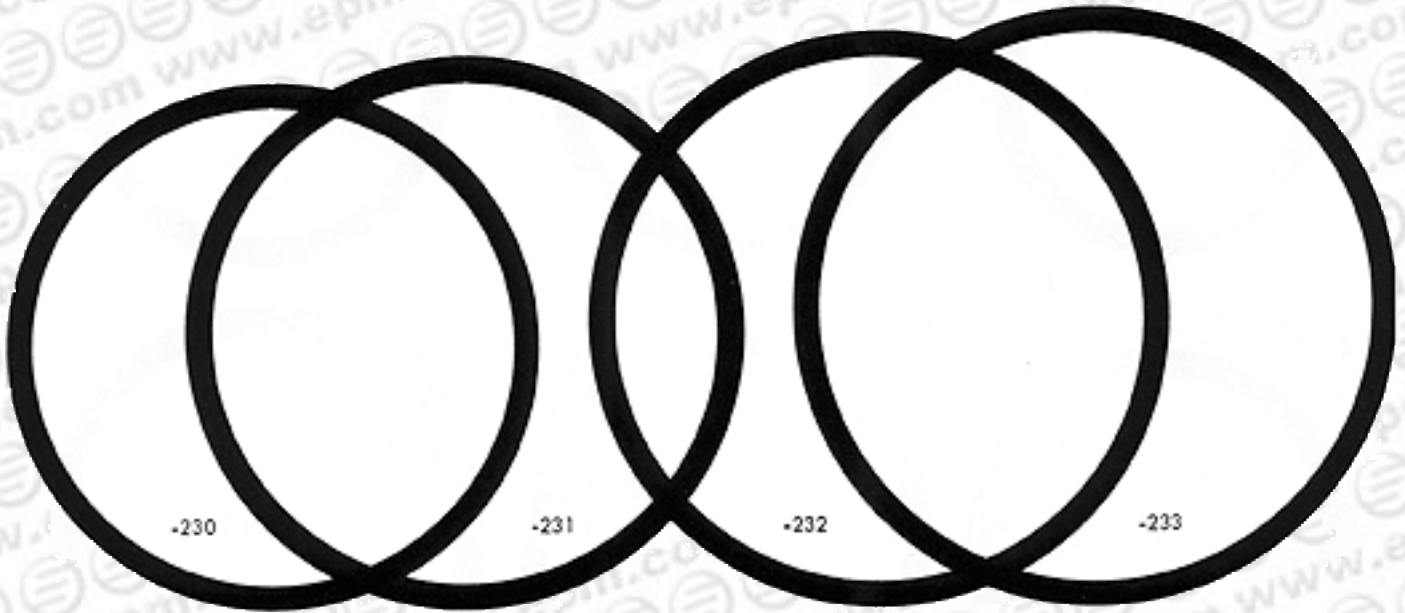
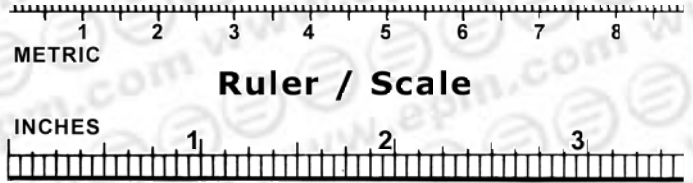
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 1/8" Width

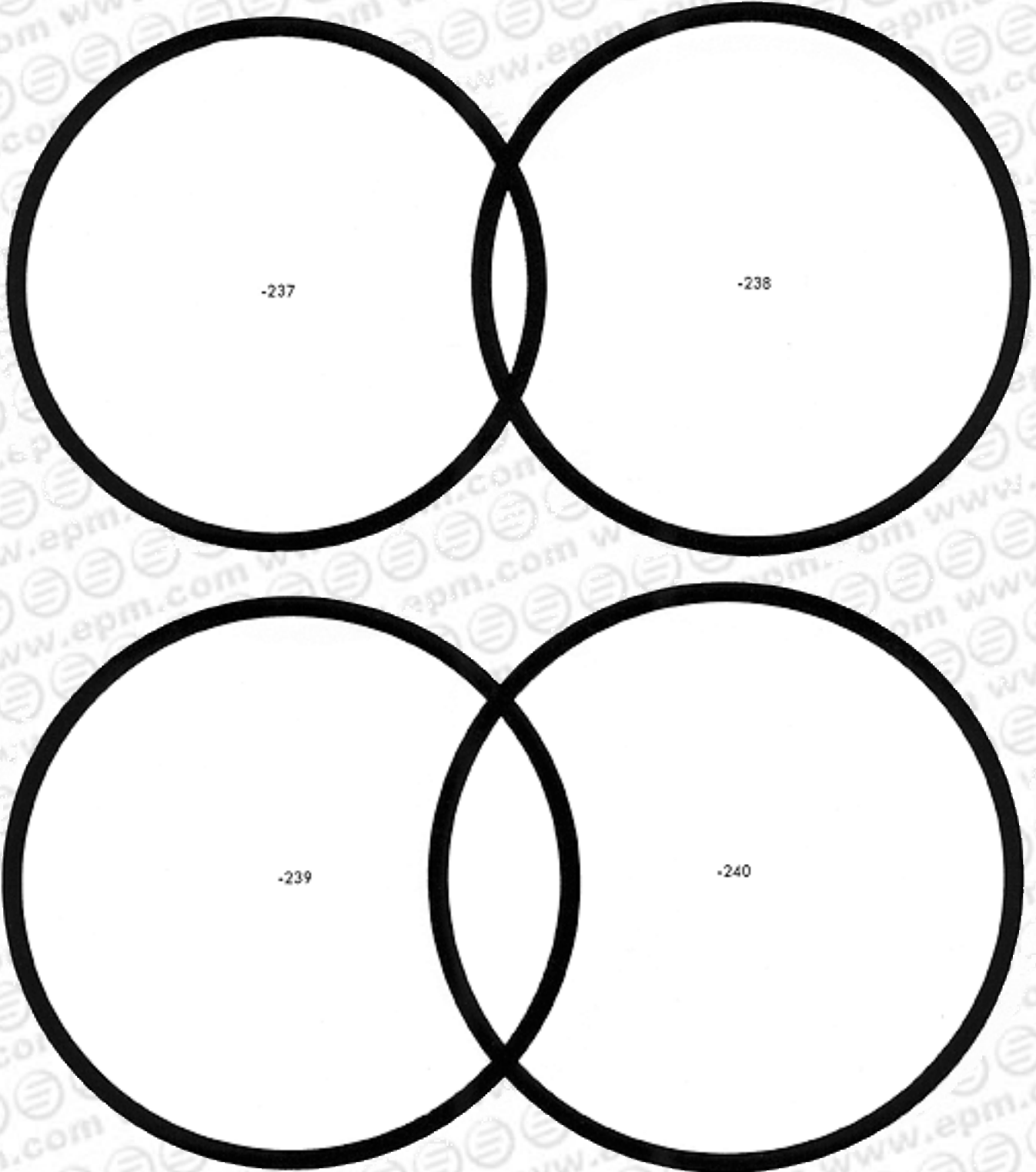
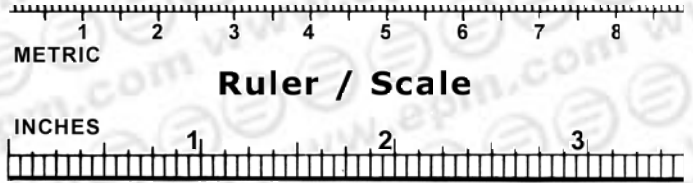
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 1/8" Width

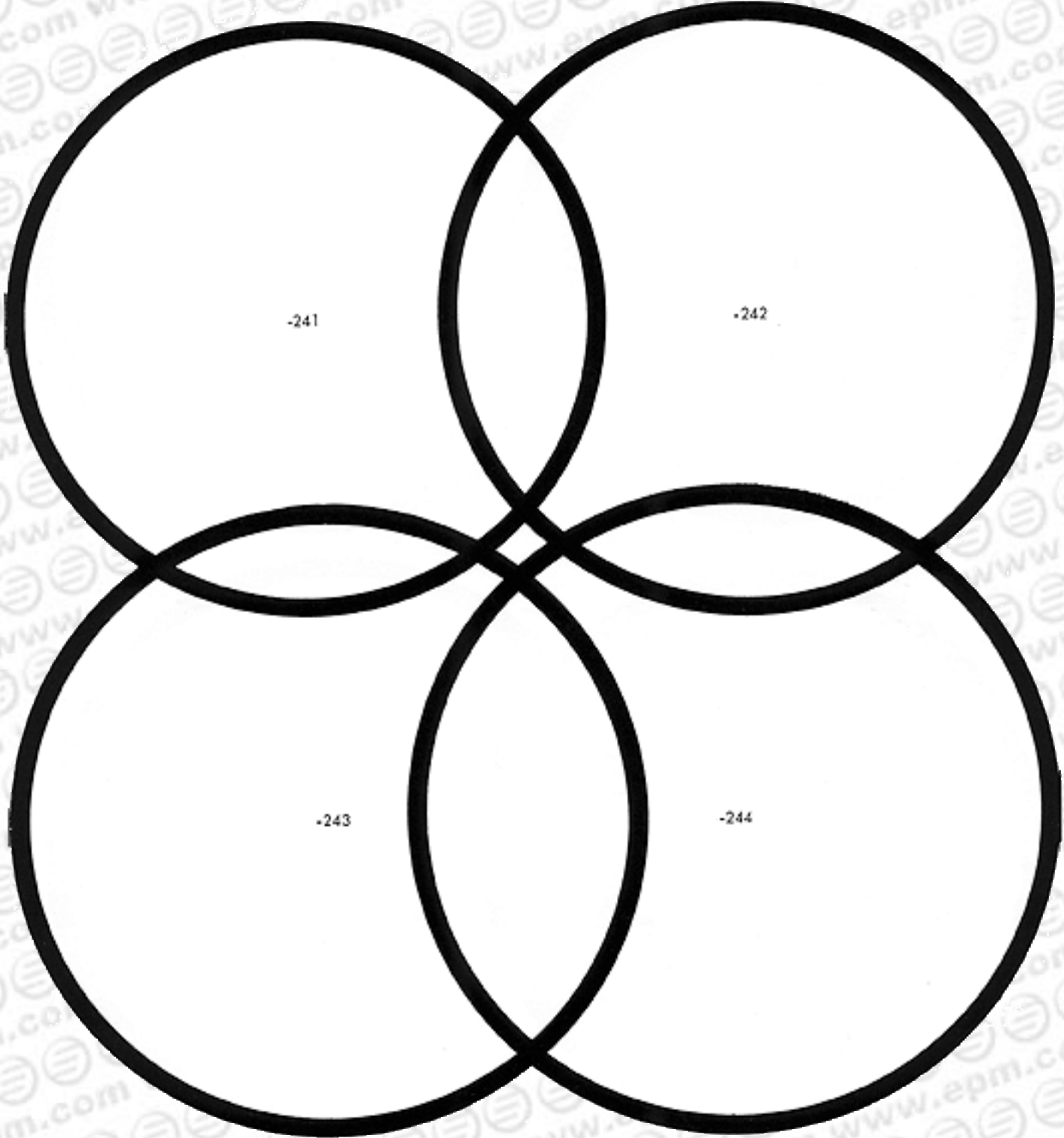
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 1/8" Width

To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.

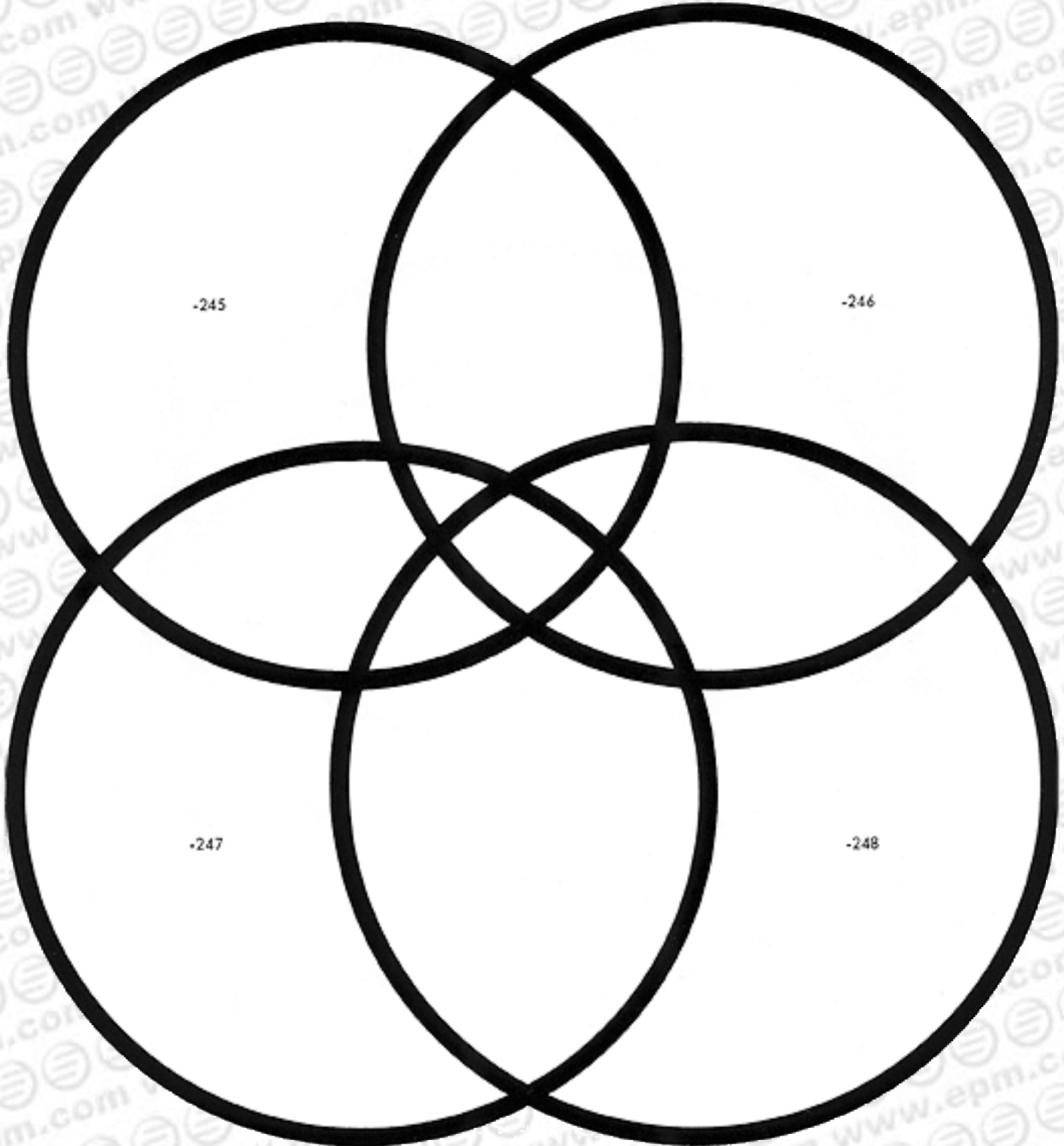
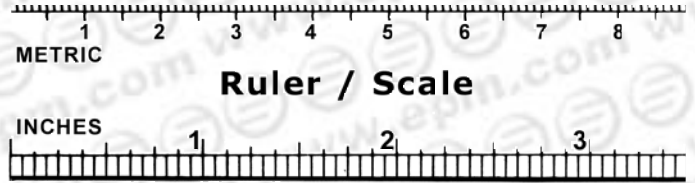






### Shadow Graphs - 1/8" Width

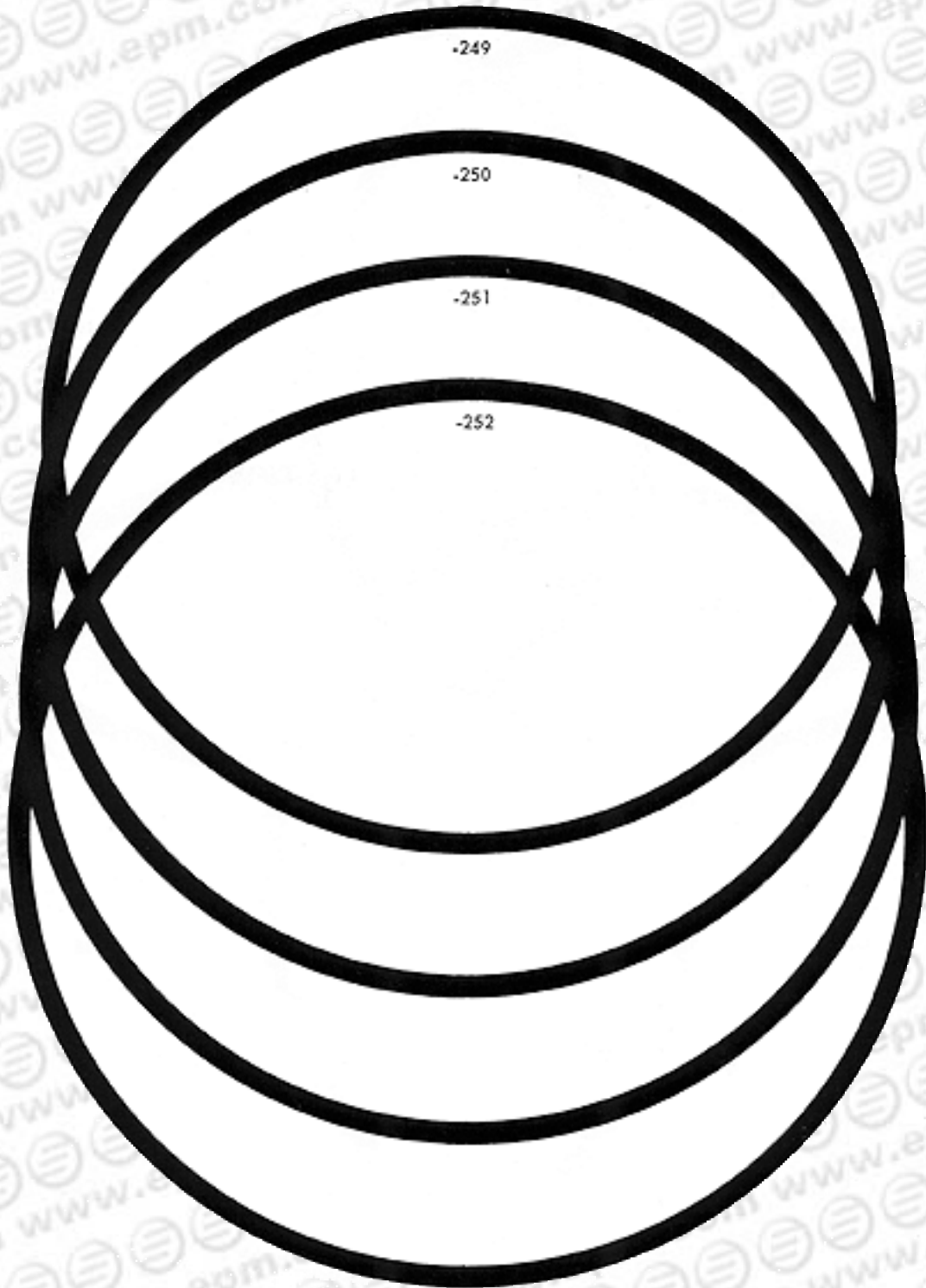
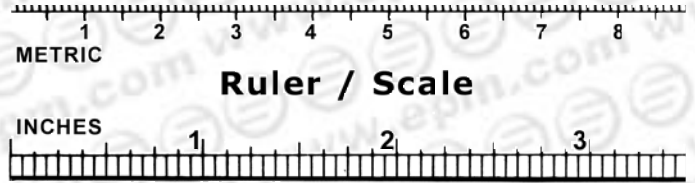
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 1/8" Width

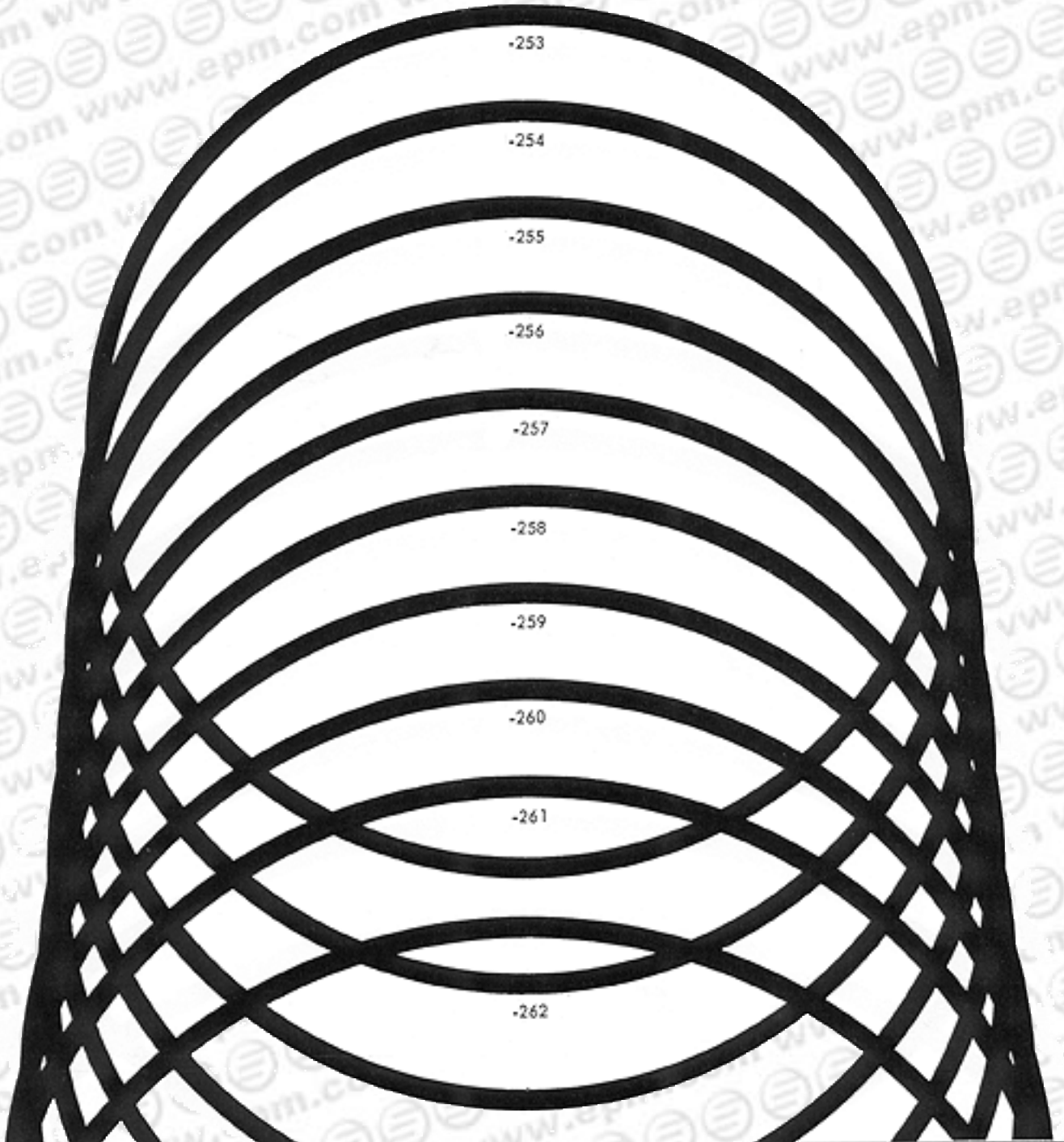
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 1/8" Width

To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.

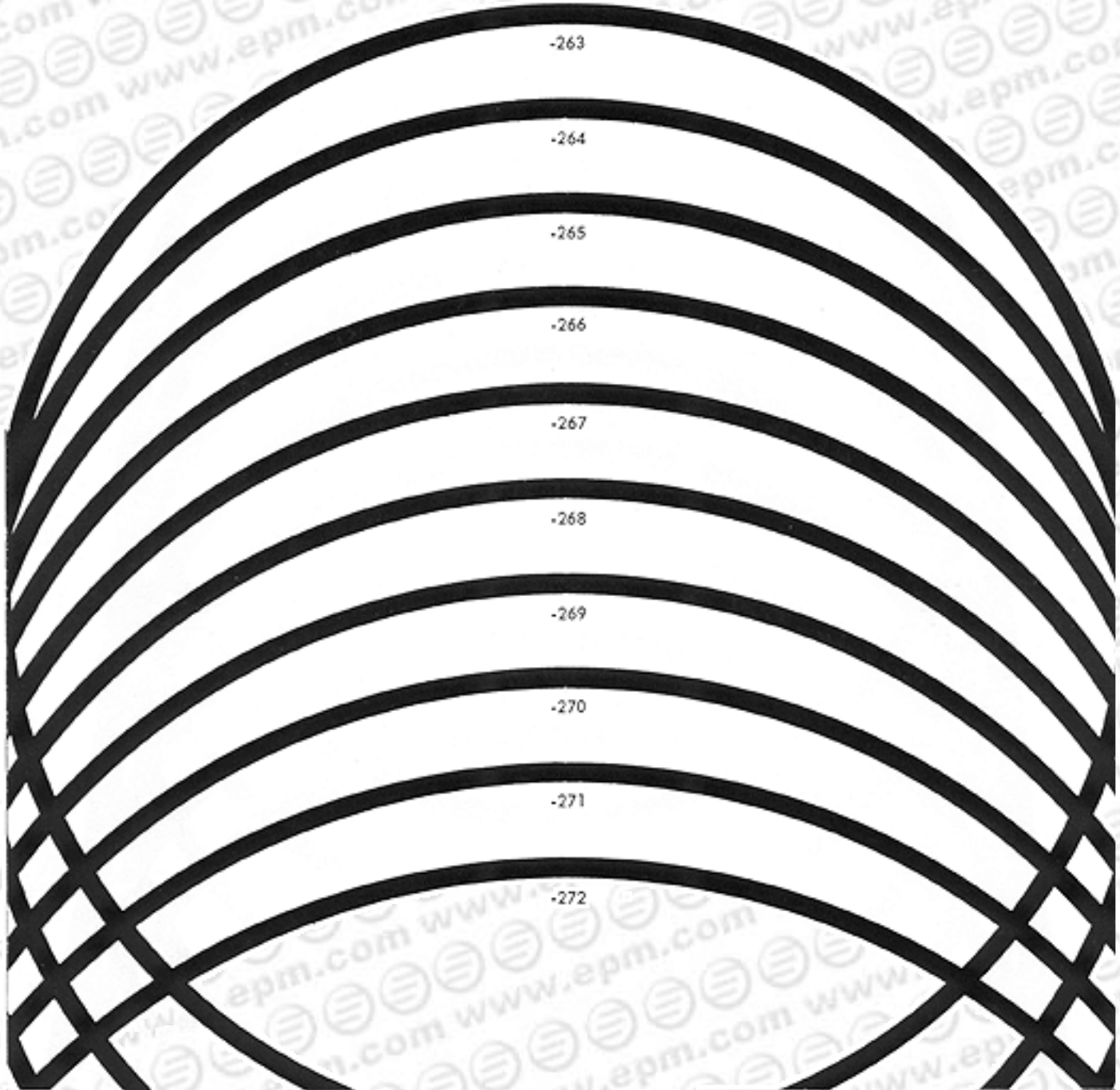


\*Note: These larger O-Rings are not able to fit in whole on a letter-sized page. If you need help identifying your O-Ring, then contact your EPM Customer Helper for further assistance.



### Shadow Graphs - 1/8" Width

To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.

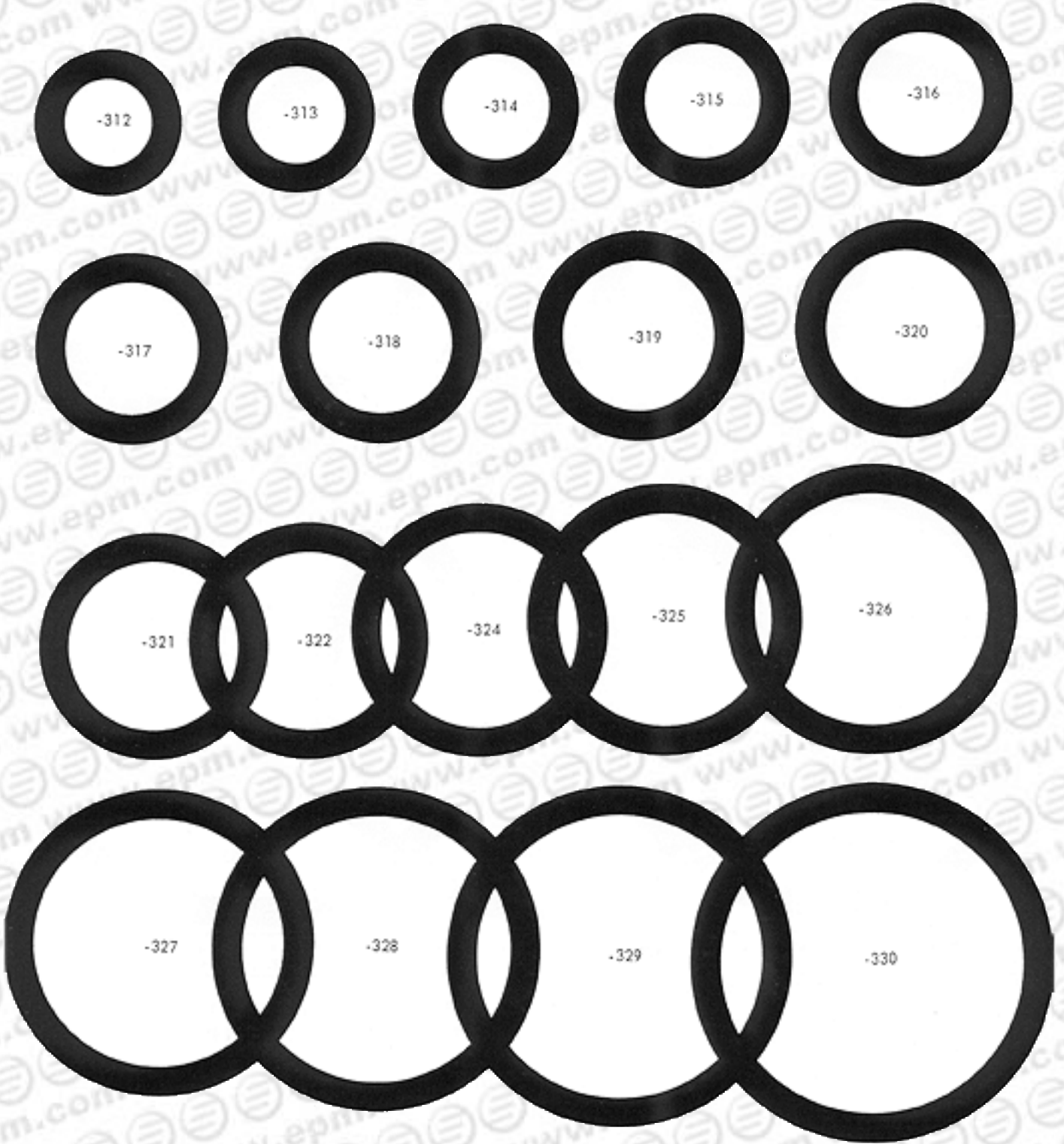
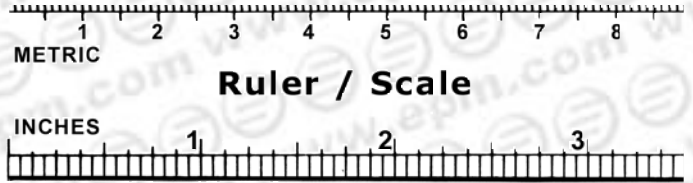


\*Note: These larger O-Rings are not able to fit in whole on a letter-sized page. If you need help identifying your O-Ring, then contact your EPM Customer Helper for further assistance.



### Shadow Graphs - 3/16" Width

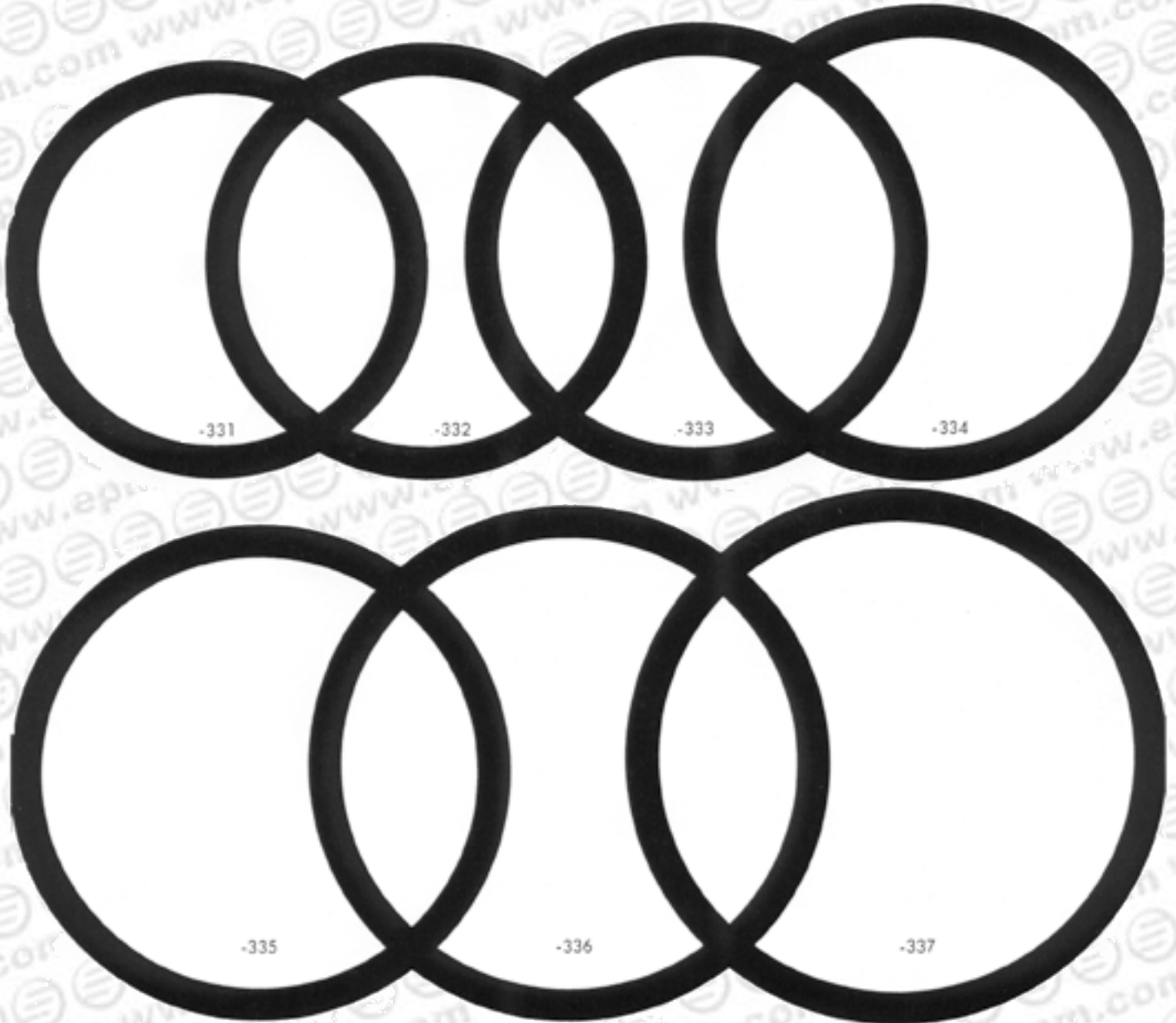
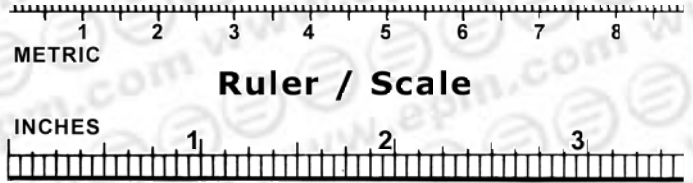
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 3/16" Width

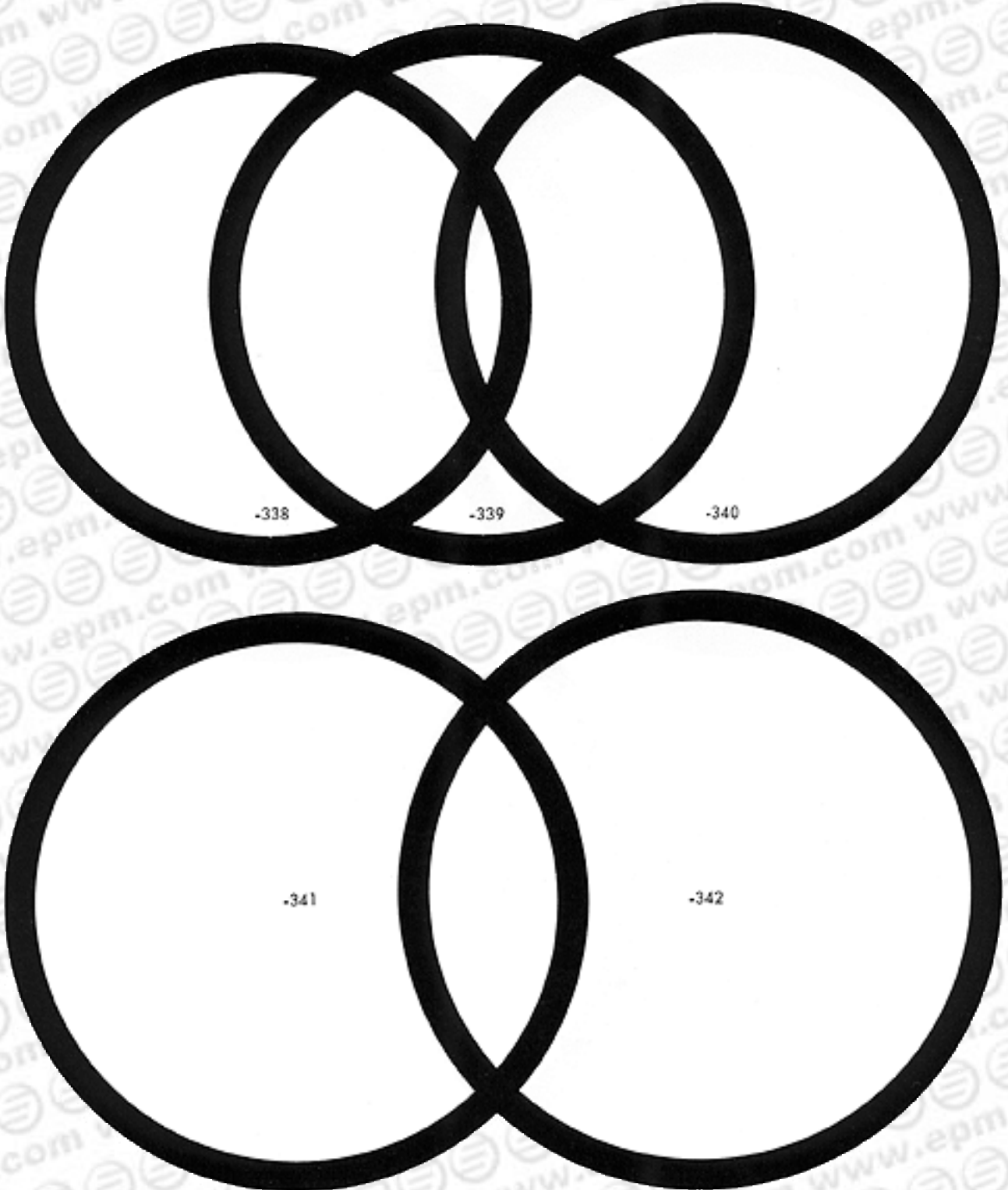
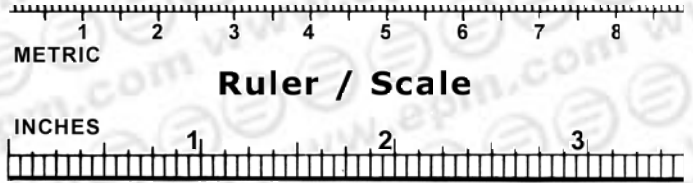
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 3/16" Width

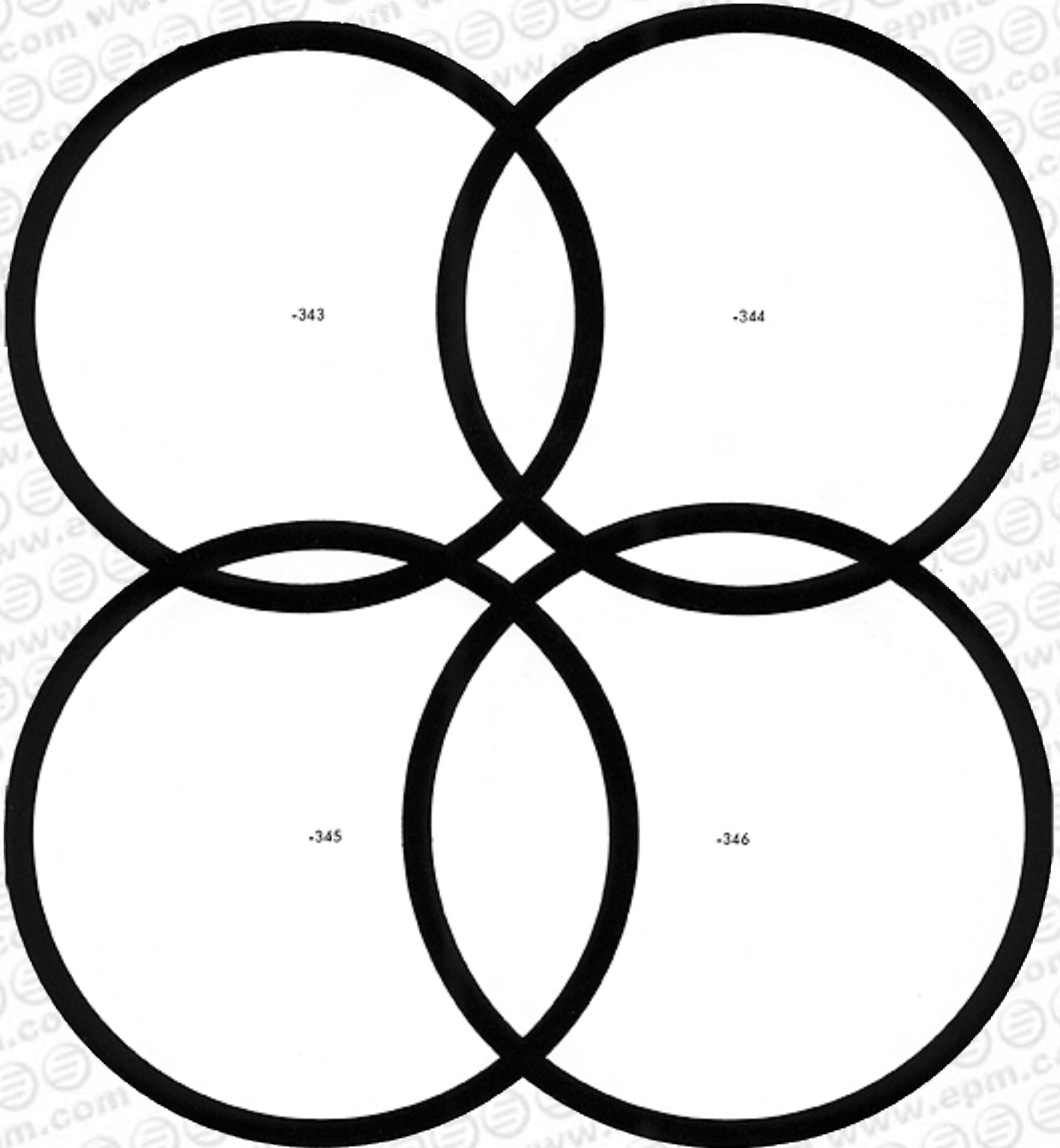
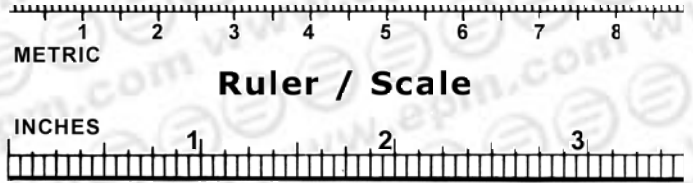
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 3/16" Width

To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.

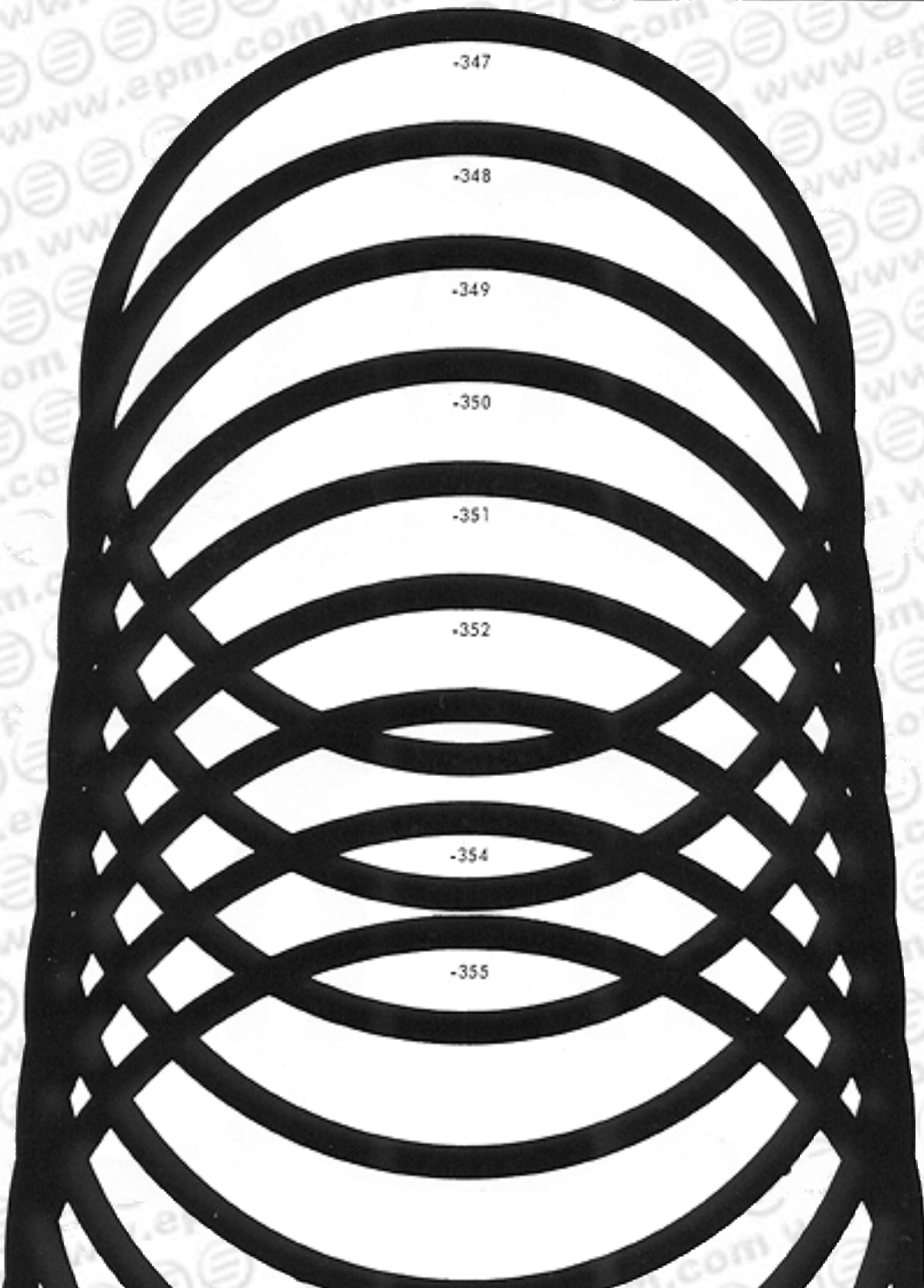






### Shadow Graphs - 3/16" Width

To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.

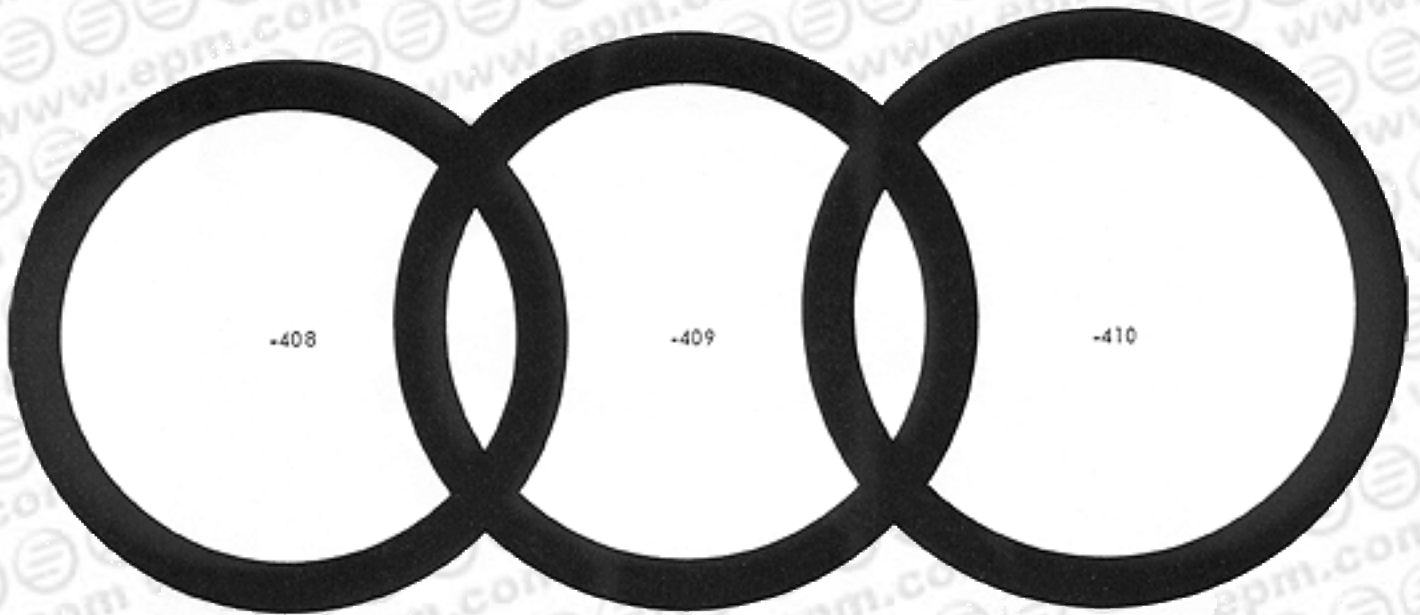
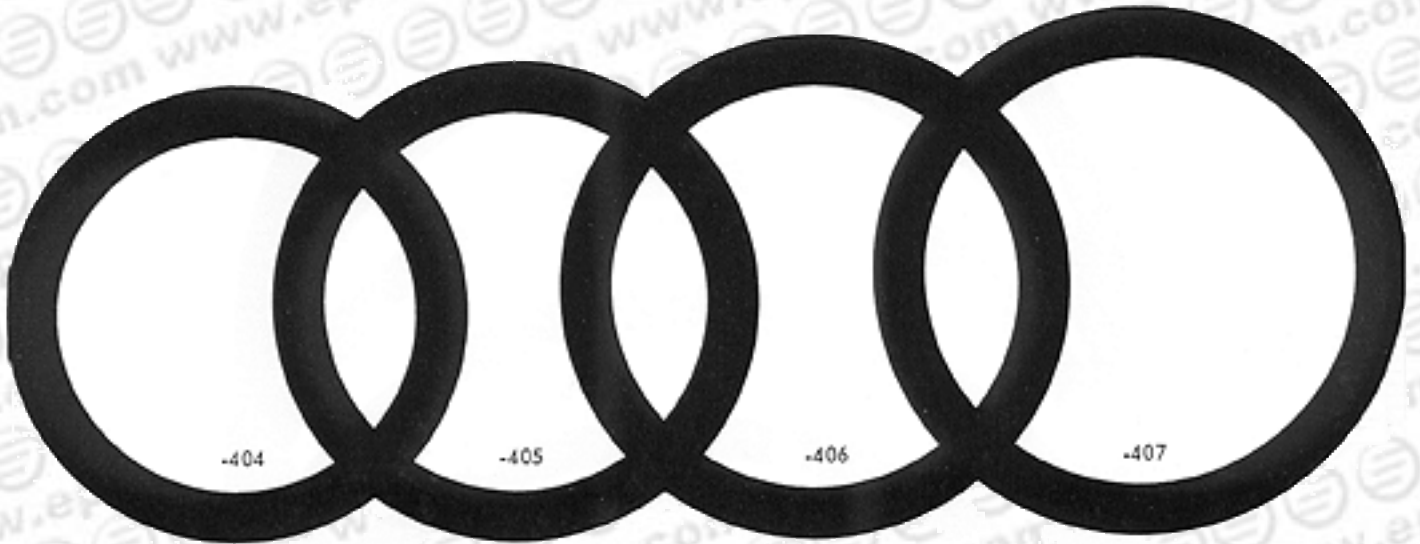
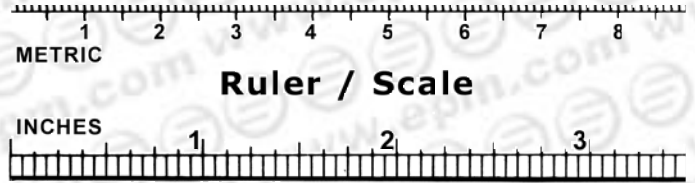


\*Note: These larger O-Rings are not able to fit in whole on a letter-sized page. If you need help identifying your O-Ring, then contact your EPM Customer Helper for further assistance.



### Shadow Graphs - 1/4" Width

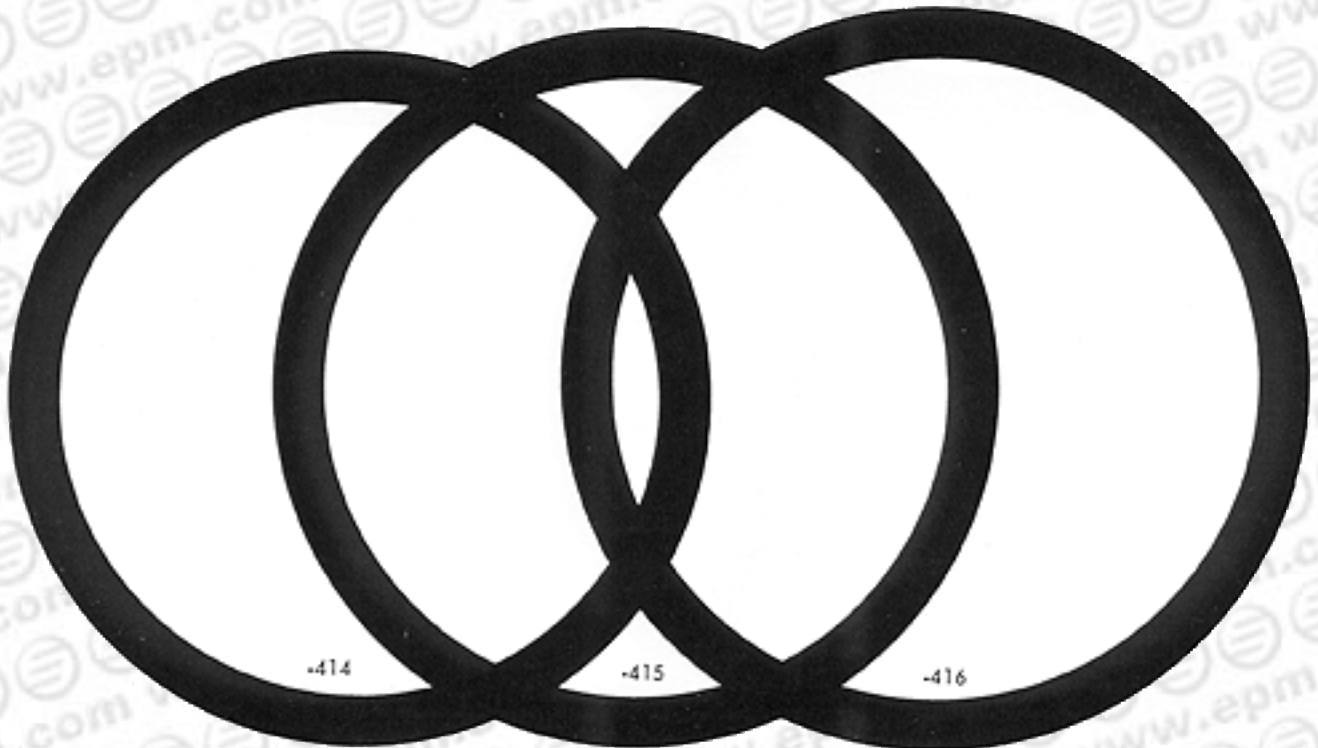
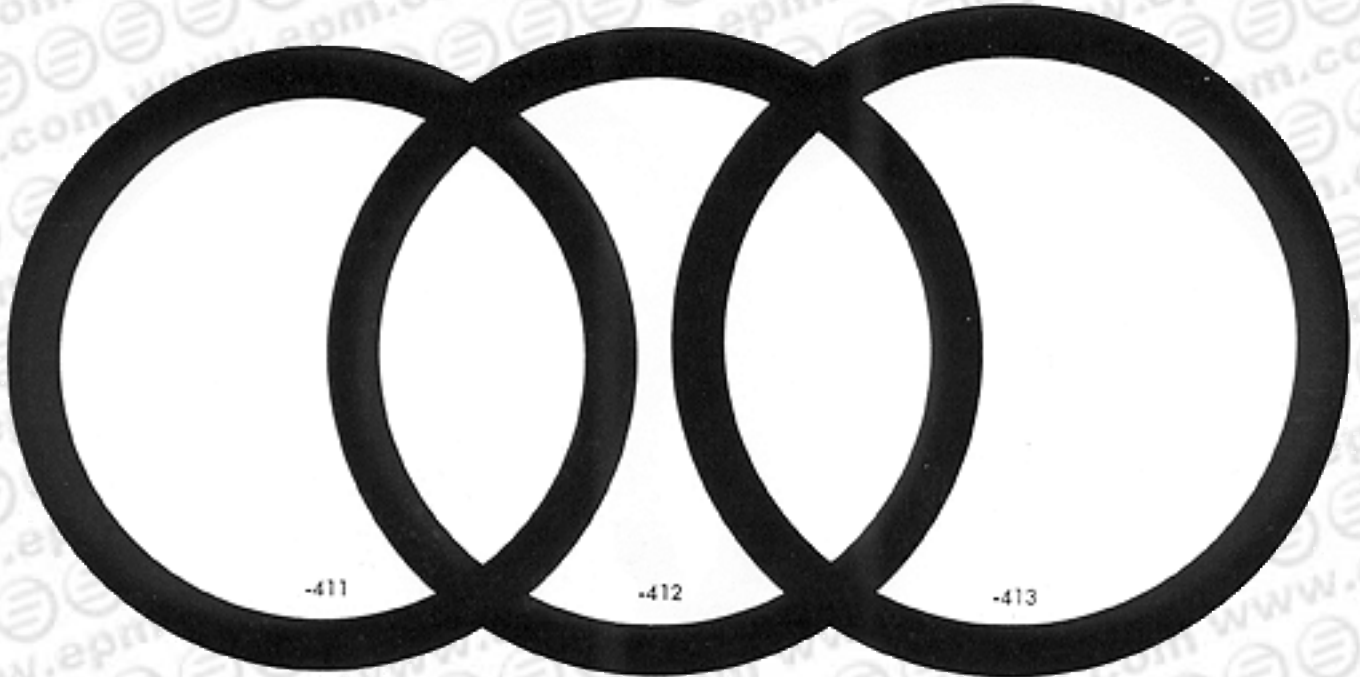
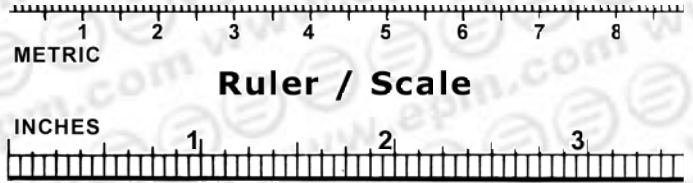
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 1/4" Width

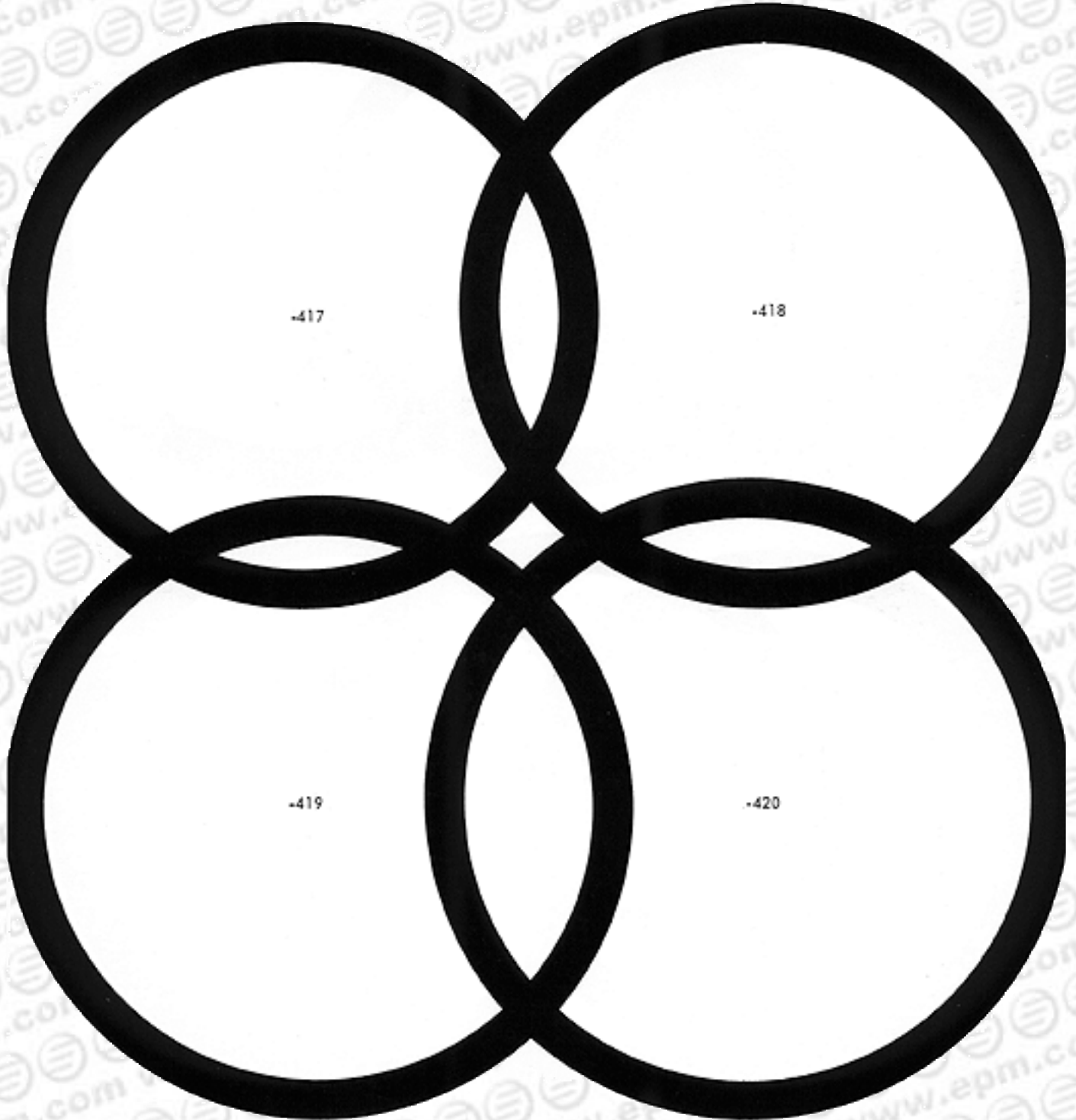
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 1/4" Width

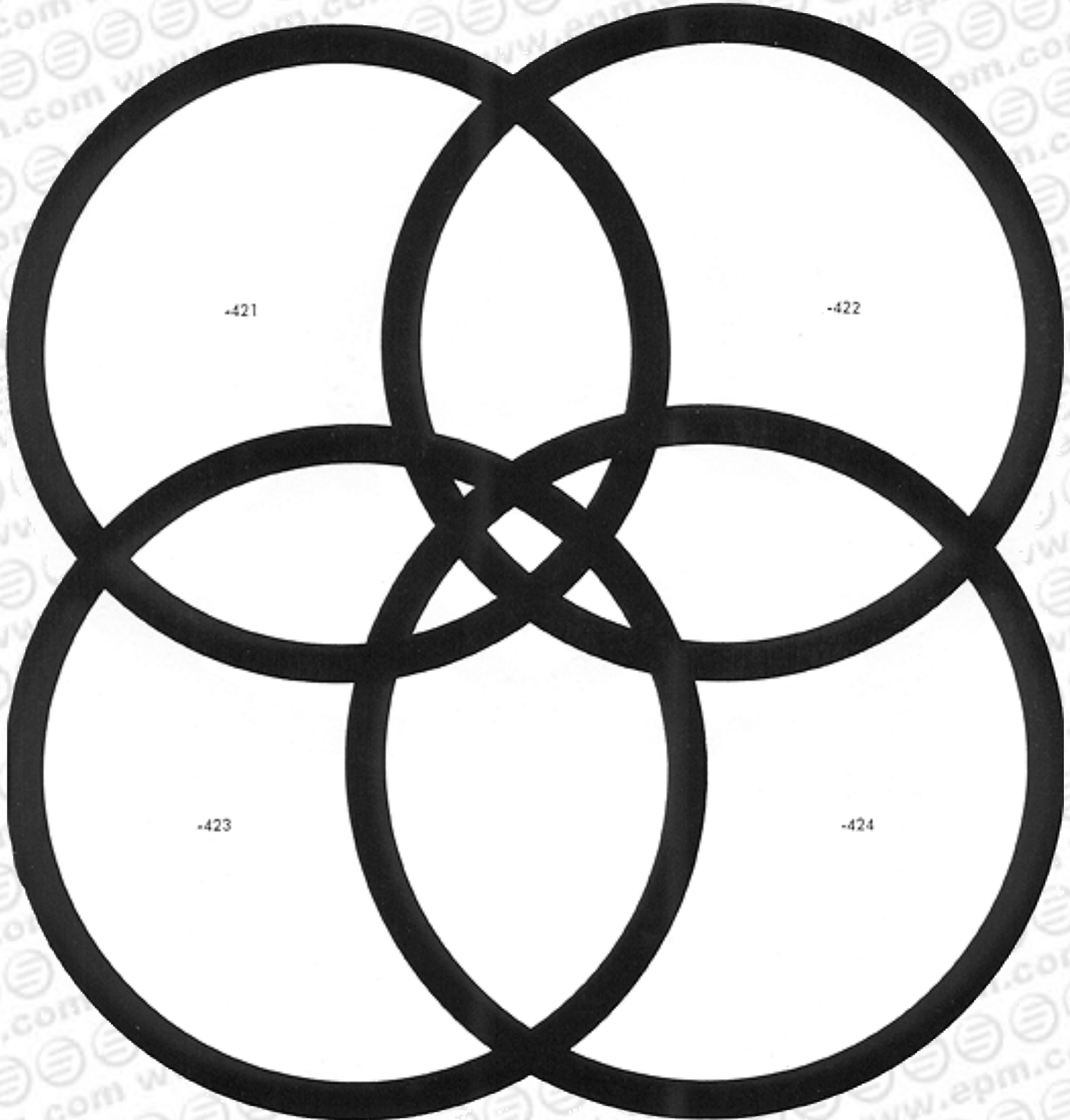
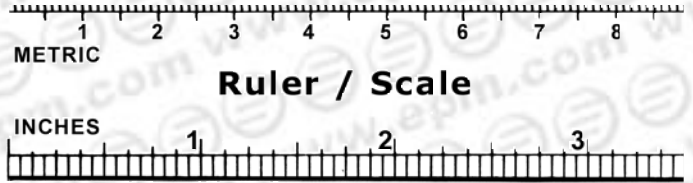
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 1/4" Width

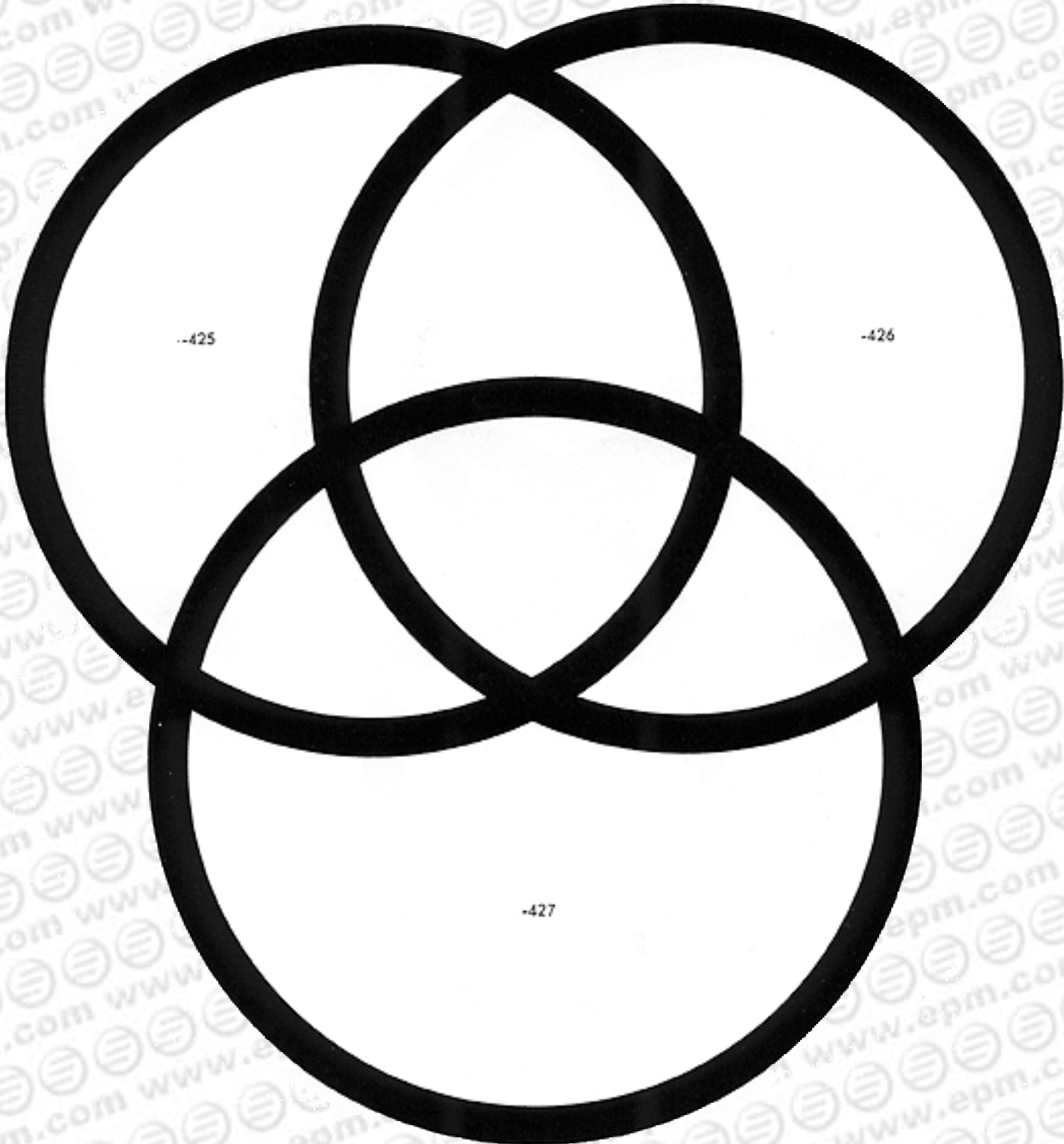
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 1/4" Width

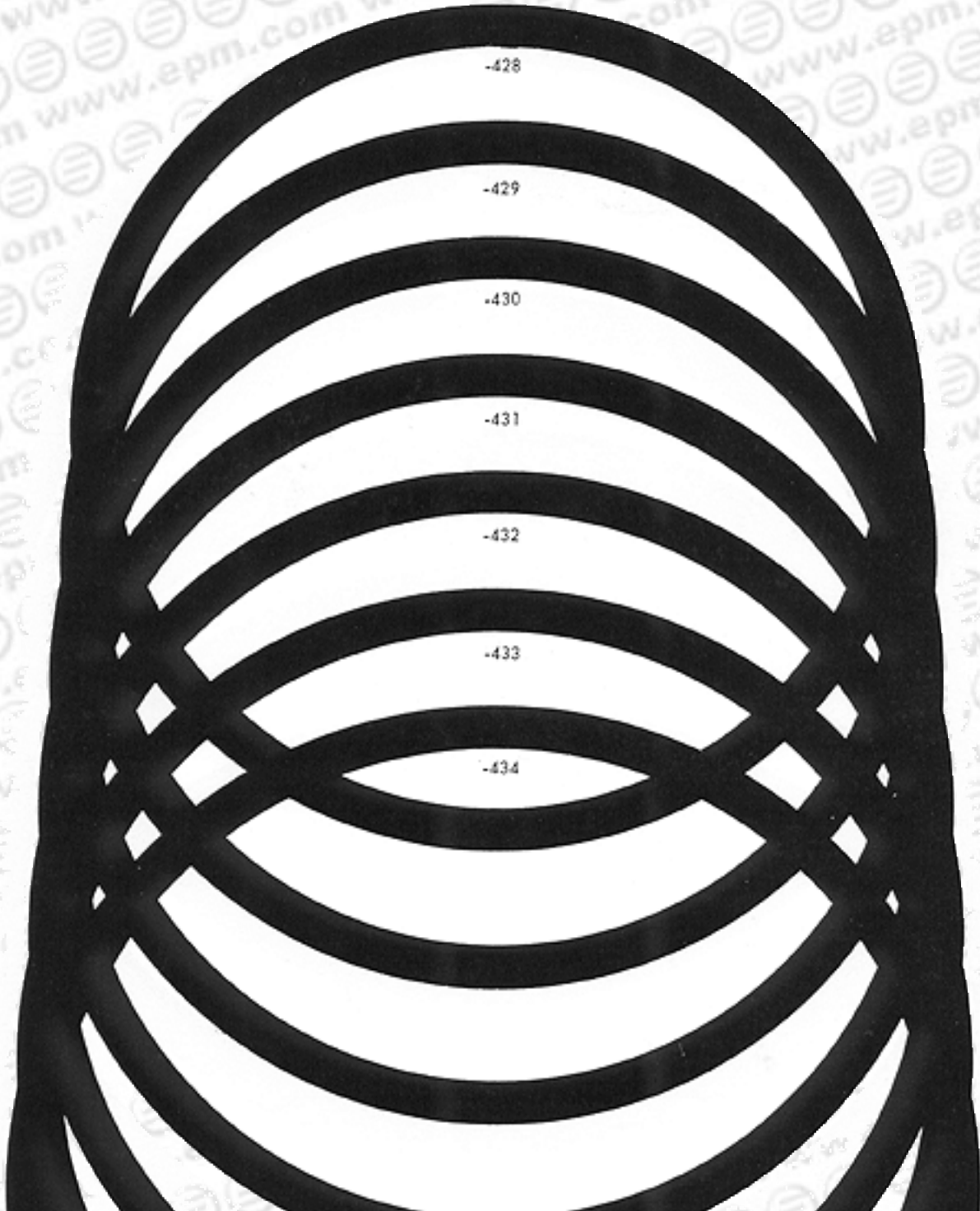
To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.





### Shadow Graphs - 1/4" Width

To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.

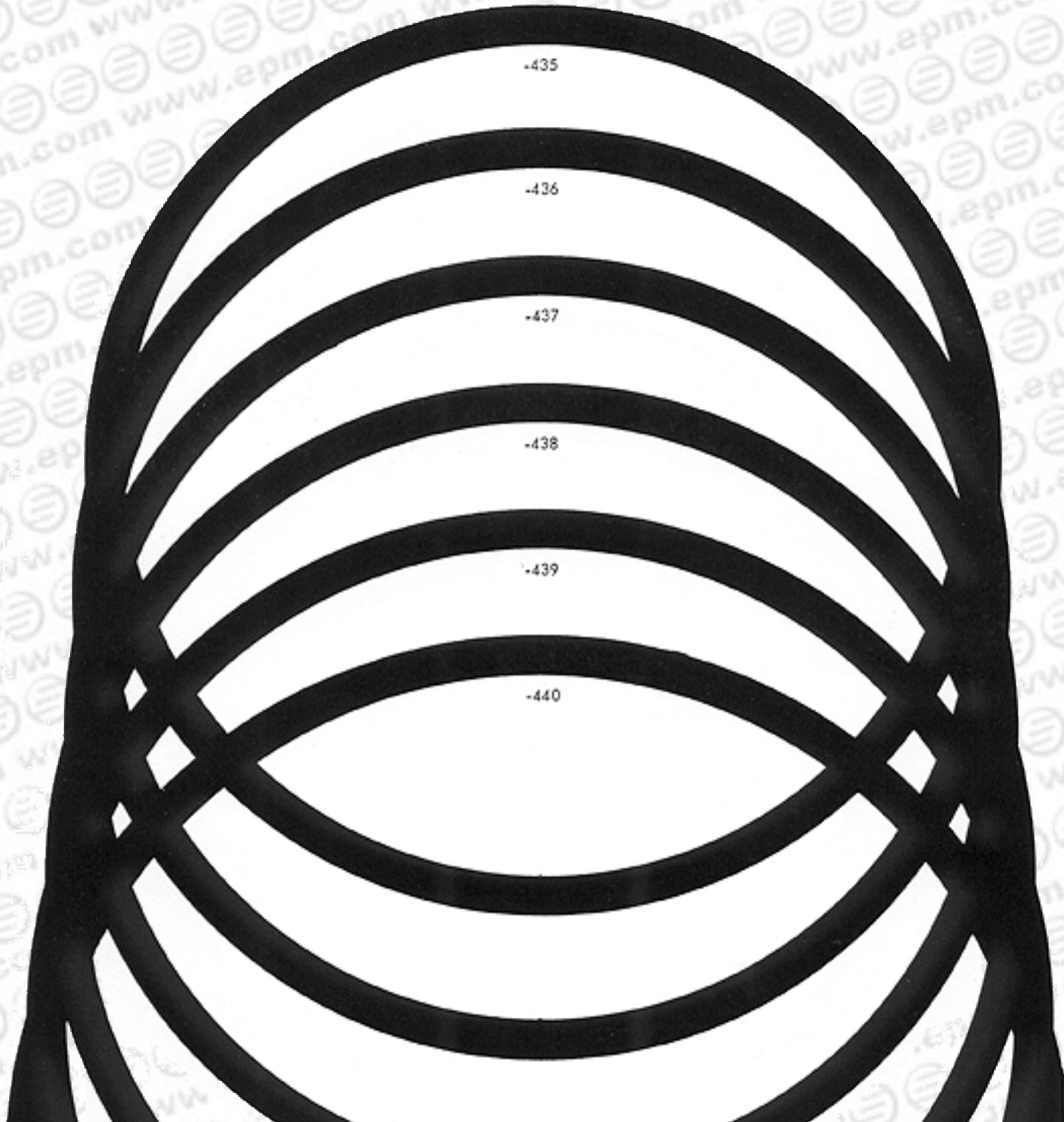


\*Note: These larger O-Rings are not able to fit in whole on a letter-sized page. If you need help identifying your O-Ring, then contact your EPM Customer Helper for further assistance.



### Shadow Graphs - 1/4" Width

To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.



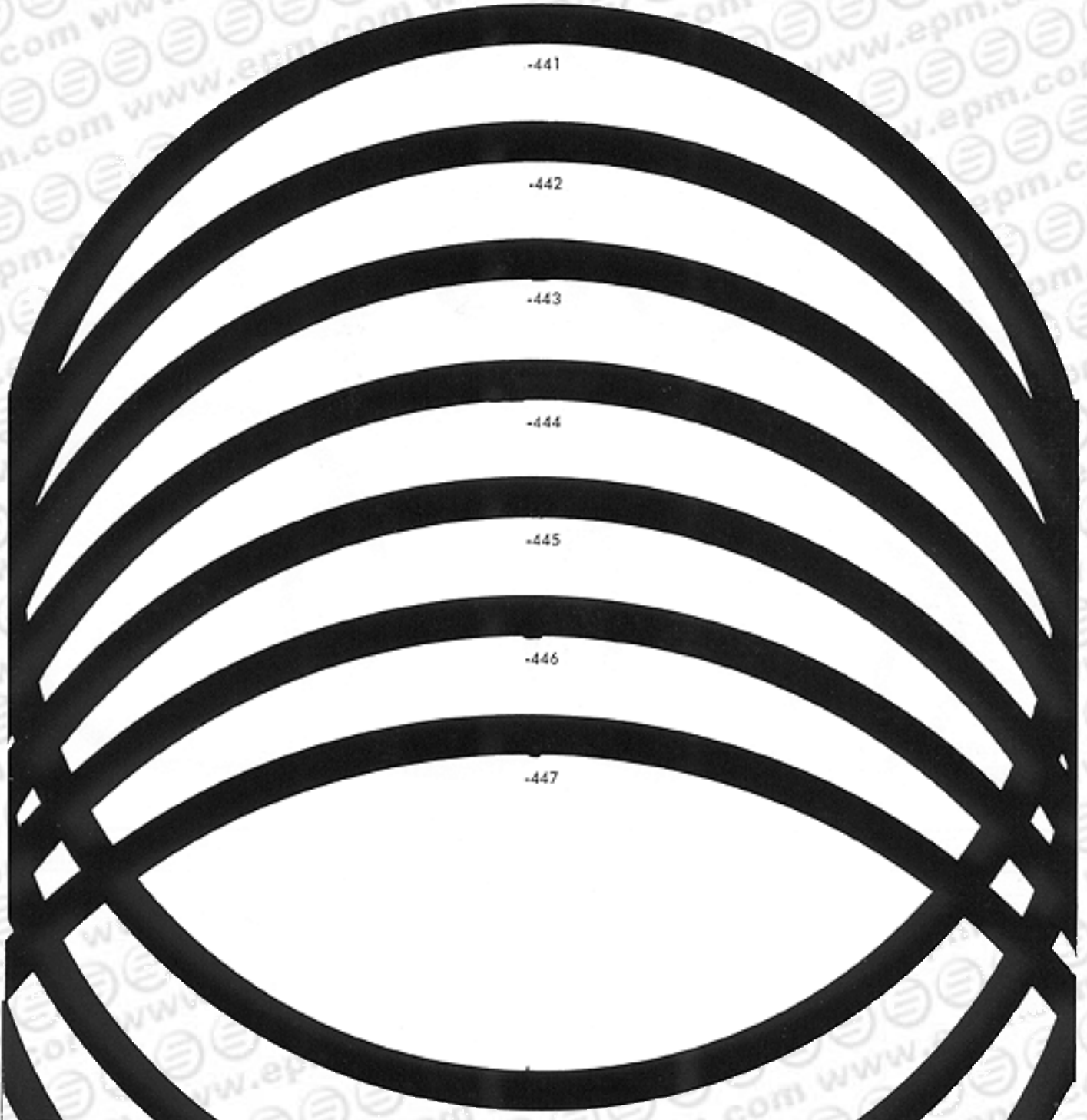
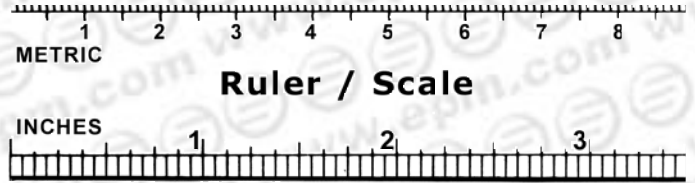
\*Note: These larger O-Rings are not able to fit in whole on a letter-sized page. If you need help identifying your O-Ring, then contact your EPM Customer Helper for further assistance.





### Shadow Graphs - 1/4" Width

To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.

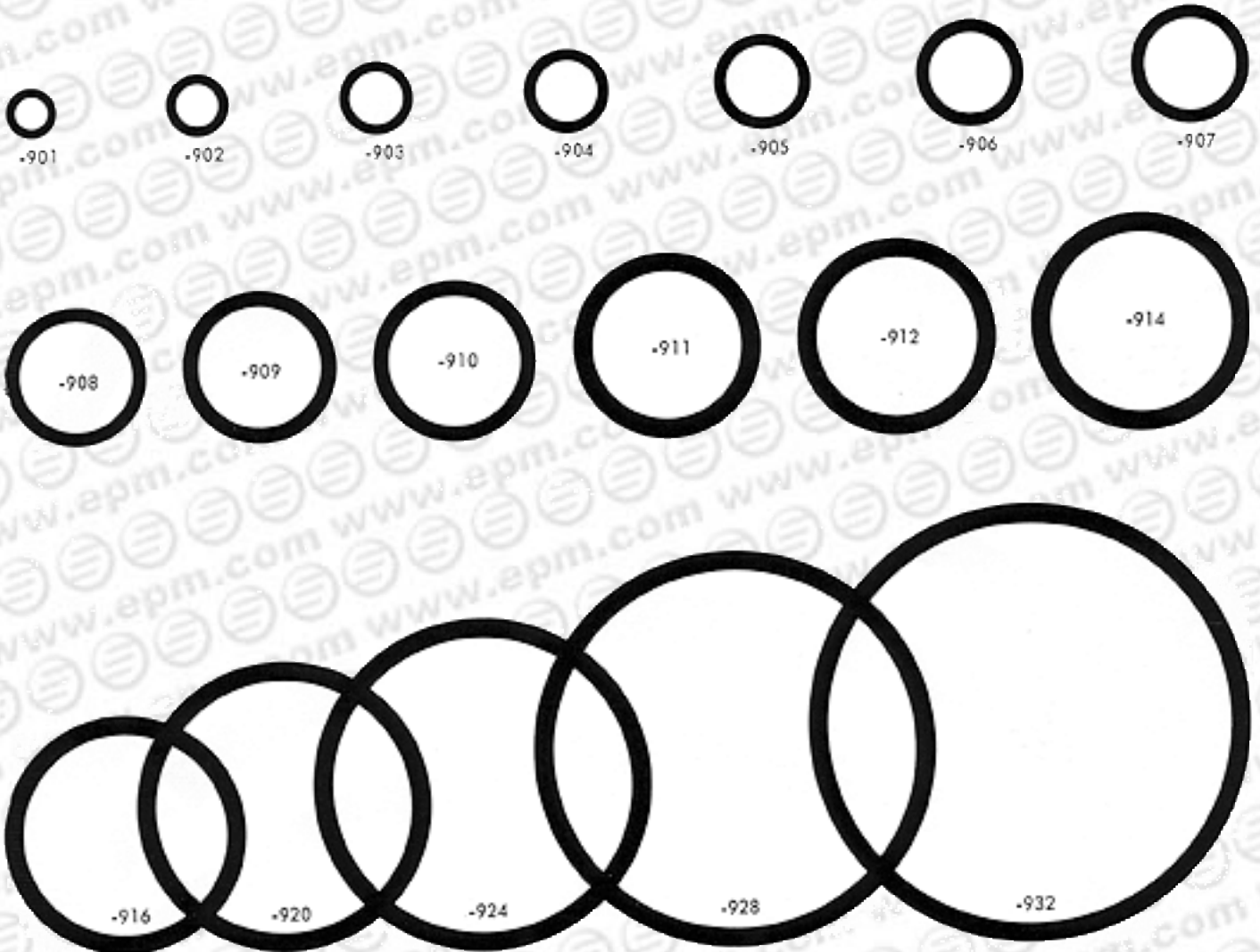
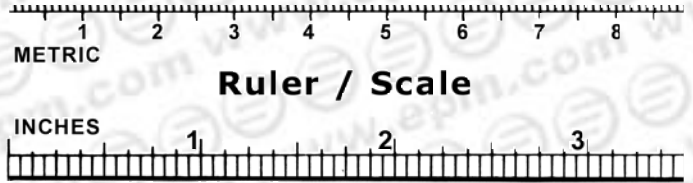


\*Note: These larger O-Rings are not able to fit in whole on a letter-sized page. If you need help identifying your O-Ring, then contact your EPM Customer Helper for further assistance.



**Shadow Graphs - Tube Fitting Bosses**

To identify your O-Ring, print this graph at 100% on any standard printer. If 1 inch on the scale matches up with 1 inch on any ruler, then your page is to scale. This will insure accurate identification of your O-Ring.



## **SUPERSmall™ O-Rings**

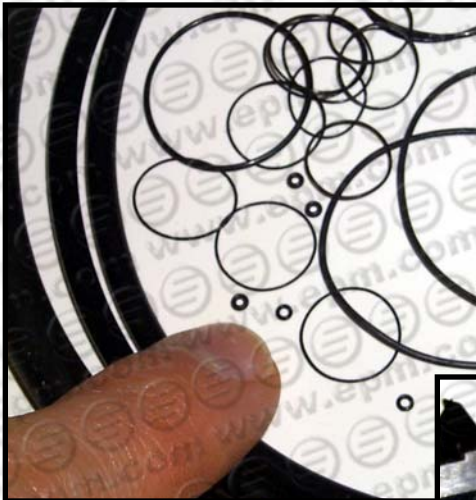
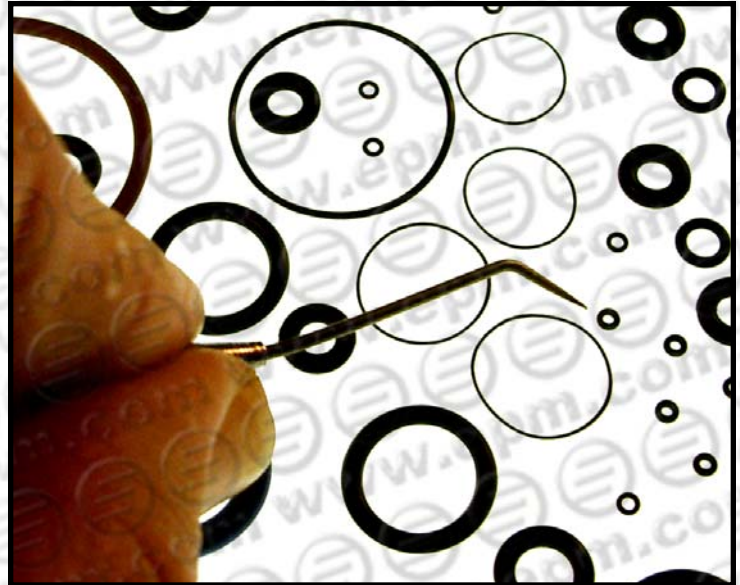
SUPERSmall™ O-Rings are available in sizes as small as .002" ID, which is 0.05 mm and with cross sections of .008" or 0.08mm.

SUPERSmall™ O-Rings are manufactured out of various materials including silicone, NBR, EPDM and fluorolastomer.

See [pages 30-36](#) for descriptions of materials.

### **Uses:**

- Watch Stems
- Miniature Variable Potentiometers
- Micro Electronic Components
- Micro Valves
- Miniature Mechanical Machinery





## Back-up Rings

Back-up rings are used in conjunction with O-Rings for both static and dynamic sealing applications. They prevent extrusion of the O-Ring when it is subjected to high pressures, or when the extrusion gaps are excessive. Wherever possible two Back-up rings should be used, one on each side of the O-Ring.

### Styles



**Flat Back-up Ring**



**Spiral Back-up Ring**



**Split Back-up Ring**

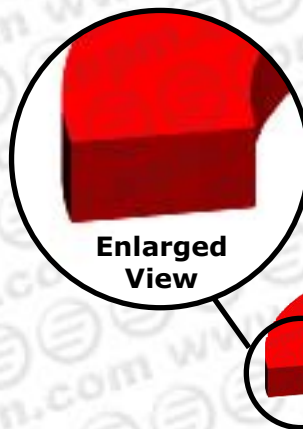
### Types



**Enlarged View**



**Concave**



**Enlarged View**



**Flat**

| O-Ring                |                      | Back-up Ring |             |             |
|-----------------------|----------------------|--------------|-------------|-------------|
| Nominal Width<br>Inch | Actual Width<br>Inch | Part Number  | Width       | Thickness   |
| 1/16                  | .070 ± .003          | -013 to -050 | .053 ± .003 | .040 ± .003 |
| 3/32                  | .103 ± .003          | -111 to -178 | .086 ± .003 | .040 ± .003 |
| 1/8                   | .139 ± .004          | -205 to -273 | .118 ± .004 | .040 ± .003 |
| 3/16                  | .210 ± .005          | -309 to -375 | .183 ± .005 | .055 ± .004 |
| 1/4                   | .275 ± .006          | -425 to -449 | .236 ± .006 | .085 ± .005 |



## Back-up Rings

Back-up rings are in stock and ready to ship in Polyurethane and PTFE materials. However, EPM can make these back-up rings in any material. See [pages 30-36](#) for our [Material Selection Guide](#).

## I N C H SIZING CHART

[Click here](#) to see [pages 114-124](#) for an inch sizing chart.



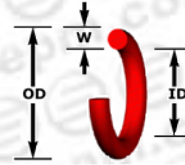
**O-Ring Sizes** - \*All inch sizes are in stock and ready to ship in NBR and VIT materials..

### I N C H

SIZING CHART (continued)



For [Groove Dimensions](#) see [pages 109-111](#).



| AS568A Dash No. | Nominal Inch Size |        |       | Actual Size (inch) |           | Actual Size (in mm's) |           |
|-----------------|-------------------|--------|-------|--------------------|-----------|-----------------------|-----------|
|                 | I.D.              | O.D.   | Width | I.D.               | Width     | I.D.                  | Width     |
| -021            | 15/16             | 1-1/16 | 1/16  | .926±.009          | .070±.003 | 23.52±0.23            | 1.78±0.08 |
| -022            | 1                 | 1-1/8  | 1/16  | .989±.010          | .070±.003 | 25.12±0.25            | 1.78±0.08 |
| -023            | 1-1/16            | 1-3/16 | 1/16  | 1.051±.010         | .070±.003 | 26.70±0.25            | 1.78±0.08 |
| -024            | 1-1/8             | 1-1/4  | 1/16  | 1.114±.010         | .070±.003 | 28.30±0.25            | 1.78±0.08 |
| -025            | 1-3/16            | 1-5/16 | 1/16  | 1.176±.011         | .070±.003 | 29.87±0.28            | 1.78±0.08 |
| -026            | 1-1/4             | 1-3/8  | 1/32  | 1.239±.011         | .070±.003 | 31.47±0.28            | 1.78±0.08 |
| -027            | 1-5/16            | 1-7/16 | 3/64  | 1.301±.011         | .070±.003 | 33.05±0.28            | 1.78±0.08 |
| -028            | 1-3/8             | 1-1/2  | 1/16  | 1.364±.013         | .070±.003 | 34.65±0.33            | 1.78±0.08 |
| -029            | 1-1/2             | 1-5/8  | 1/16  | 1.489±.013         | .070±.003 | 37.82±0.33            | 1.78±0.08 |
| -030            | 1-5/8             | 1-3/4  | 1/16  | 1.614±.013         | .070±.003 | 41.00±0.33            | 1.78±0.08 |
| -031            | 1-3/4             | 1-7/8  | 1/16  | 1.739±.015         | .070±.003 | 44.17±0.38            | 1.78±0.08 |
| -032            | 1-7/8             | 2      | 1/16  | 1.864±.015         | .070±.003 | 47.35±0.38            | 1.78±0.08 |
| -033            | 2                 | 2-1/8  | 1/16  | 1.989±.018         | .070±.003 | 50.52±0.46            | 1.78±0.08 |
| -034            | 2-1/8             | 2-1/4  | 1/16  | 2.114±.018         | .070±.003 | 53.70±0.46            | 1.78±0.08 |
| -035            | 2-1/4             | 2-3/8  | 1/16  | 2.239±.018         | .070±.003 | 56.87±0.46            | 1.78±0.08 |
| -036            | 2-3/8             | 2-1/2  | 1/16  | 2.364±.018         | .070±.003 | 60.05±0.46            | 1.78±0.08 |
| -037            | 2-1/2             | 2-5/8  | 1/16  | 2.489±.018         | .070±.003 | 63.22±0.46            | 1.78±0.08 |
| -038            | 2-5/8             | 2-3/4  | 1/16  | 2.614±.020         | .070±.003 | 66.40±0.51            | 1.78±0.08 |
| -039            | 2-3/4             | 2-7/8  | 1/16  | 2.739±.020         | .070±.003 | 69.57±0.51            | 1.78±0.08 |
| -040            | 2-7/8             | 3      | 1/16  | 2.864±.020         | .070±.003 | 72.75±0.51            | 1.78±0.08 |
| -041            | 3                 | 3-1/8  | 1/16  | 2.989±.024         | .070±.003 | 75.92±0.61            | 1.78±0.08 |
| -042            | 3-1/4             | 3-3/8  | 1/16  | 3.239±.024         | .070±.003 | 82.27±0.61            | 1.78±0.08 |
| -043            | 3-1/2             | 3-5/8  | 1/16  | 3.489±.024         | .070±.003 | 88.62±0.61            | 1.78±0.08 |
| -044            | 3-3/4             | 3-7/8  | 1/16  | 3.739±.027         | .070±.003 | 94.97±0.69            | 1.78±0.08 |
| -045            | 4                 | 4-1/8  | 1/16  | 3.989±.027         | .070±.003 | 101.32±0.69           | 1.78±0.08 |
| -046            | 4-1/4             | 4-3/8  | 1/16  | 4.239±.030         | .070±.003 | 107.67±0.76           | 1.78±0.08 |
| -047            | 4-1/2             | 4-5/8  | 1/16  | 4.489±.030         | .070±.003 | 114.02±0.76           | 1.78±0.08 |
| -048            | 4-3/4             | 4-7/8  | 1/16  | 4.739±.033         | .070±.003 | 120.37±0.83           | 1.78±0.08 |
| -049            | 5                 | 5-1/8  | 1/16  | 4.989±.033         | .070±.003 | 126.72±0.83           | 1.78±0.08 |
| -050            | 5                 | 5-1/8  | 1/16  | 4.989±.033         | .070±.003 | 126.72±0.83           | 1.78±0.08 |

[Click here](#) to see [pages 114-124](#) for an inch sizing chart.



## Back-up Rings

Back-up rings are in stock and ready to ship in Polyurethane and PTFE materials. However, EPM can make these back-up rings in any material. See [pages 30-36](#) for our [Material Selection Guide](#).

## METRIC SIZING CHART

[Click here](#) to see [pages 125-158](#) for a metric sizing chart.

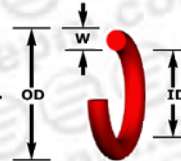


**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

### METRIC SIZING CHART



For [Groove Dimensions](#) see [pages 109-111](#).



| Width (mm)  | I.D. (mm)    | Cross Ref. |
|-------------|--------------|------------|
| 1.00        | 1.15         | -          |
| 1.00        | 1.25         | -          |
| <b>1.00</b> | <b>1.50</b>  | -          |
| 1.00        | 1.80         | -          |
| <b>1.00</b> | <b>2.00</b>  | -          |
| <b>1.00</b> | <b>2.50</b>  | -          |
| 1.00        | 2.70         | -          |
| <b>1.00</b> | <b>3.00</b>  | -          |
| 1.00        | 3.30         | -          |
| <b>1.00</b> | <b>3.50</b>  | -          |
| <b>1.00</b> | <b>4.00</b>  | -          |
| <b>1.00</b> | <b>4.50</b>  | -          |
| <b>1.00</b> | <b>5.00</b>  | -          |
| <b>1.00</b> | <b>5.50</b>  | -          |
| <b>1.00</b> | <b>6.00</b>  | -          |
| <b>1.00</b> | <b>6.50</b>  | -          |
| <b>1.00</b> | <b>7.00</b>  | -          |
| 1.00        | 7.20         | -          |
| <b>1.00</b> | <b>7.50</b>  | -          |
| <b>1.00</b> | <b>8.00</b>  | -          |
| <b>1.00</b> | <b>8.50</b>  | -          |
| <b>1.00</b> | <b>9.00</b>  | -          |
| <b>1.00</b> | <b>9.50</b>  | -          |
| <b>1.00</b> | <b>10.00</b> | -          |
| <b>1.00</b> | <b>10.50</b> | -          |
| <b>1.00</b> | <b>11.00</b> | -          |
| <b>1.00</b> | <b>11.50</b> | -          |
| <b>1.00</b> | <b>12.00</b> | -          |
| <b>1.00</b> | <b>12.50</b> | -          |

| Width (mm)  | I.D. (mm)    | Cross Ref. |
|-------------|--------------|------------|
| <b>1.00</b> | <b>13.50</b> | -          |
| <b>1.00</b> | <b>14.00</b> | -          |
| <b>1.00</b> | <b>14.50</b> | -          |
| <b>1.00</b> | <b>15.00</b> | -          |
| <b>1.00</b> | <b>15.50</b> | -          |
| <b>1.00</b> | <b>16.00</b> | -          |
| <b>1.00</b> | <b>16.50</b> | -          |
| <b>1.00</b> | <b>17.00</b> | -          |
| <b>1.00</b> | <b>17.50</b> | -          |
| <b>1.00</b> | <b>18.00</b> | -          |
| <b>1.00</b> | <b>18.50</b> | -          |
| <b>1.00</b> | <b>19.00</b> | -          |
| <b>1.00</b> | <b>19.50</b> | -          |
| <b>1.00</b> | <b>20.00</b> | -          |
| <b>1.00</b> | <b>20.50</b> | -          |
| <b>1.00</b> | <b>21.00</b> | -          |
| <b>1.00</b> | <b>21.50</b> | -          |
| <b>1.00</b> | <b>22.00</b> | -          |
| <b>1.00</b> | <b>22.50</b> | -          |
| <b>1.00</b> | <b>23.00</b> | -          |
| <b>1.00</b> | <b>23.50</b> | -          |
| <b>1.00</b> | <b>24.00</b> | -          |
| <b>1.00</b> | <b>24.50</b> | -          |
| <b>1.00</b> | <b>25.00</b> | -          |
| 1.00        | 28.00        | -          |
| 1.00        | 29.40        | -          |
| 1.00        | 29.00        | -          |

| Width (mm)  | I.D. (mm)    | Cross Ref. |
|-------------|--------------|------------|
| 1.19        | 4.32         | -          |
| 1.20        | 2.50         | -          |
| 1.20        | 2.60         | -          |
| 1.20        | 3.50         | -          |
| 1.20        | 5.00         | -          |
| 1.20        | 24.00        | -          |
| 1.20        | 26.00        | -          |
| 1.20        | 28.00        | -          |
| 1.20        | 35.00        | -          |
| 1.20        | 40.00        | -          |
| 1.20        | 53.50        | -          |
| 1.20        | 98.00        | -          |
| 1.25        | 3.80         | -          |
| 1.25        | 8.00         | -          |
| 1.25        | 16.00        | -          |
| 1.27        | 3.25         | -          |
| 1.27        | 3.91         | -          |
| 1.27        | 4.47         | -          |
| 1.30        | 2.50         | -          |
| 1.30        | 8.00         | -          |
| 1.30        | 10.00        | -          |
| <b>1.30</b> | <b>11.00</b> | -          |
| 1.30        | 13.50        | -          |
| 1.30        | 20.00        | -          |
|             | 1.80         | -          |

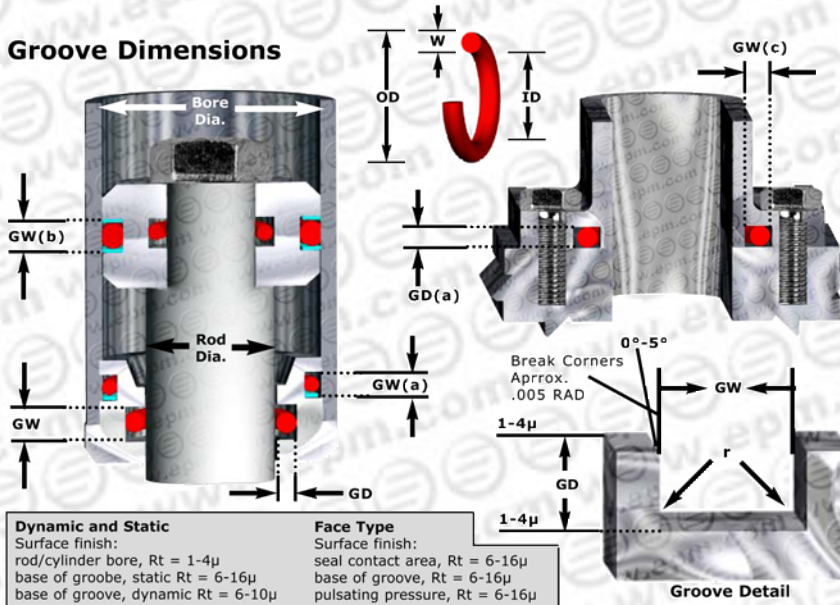
[Click here](#) to see [pages 125-158](#) for a metric sizing chart.

# Back-up Rings

## GROOVE DIMENSIONS

To determine groove dimensions, [click here](#) to see [pages 109-111](#).

Calculate 50% of the squeeze.



| Inch O-Ring<br>W | Metric O-Ring<br>W | Groove Depth<br>GD + 0.06<br>Tol. + 0.06 | Dynamic and Static     |                             |                             | Face Type                           |                                     | Radius               |                   |
|------------------|--------------------|------------------------------------------|------------------------|-----------------------------|-----------------------------|-------------------------------------|-------------------------------------|----------------------|-------------------|
|                  |                    |                                          | Groove Width           |                             |                             | Groove Depth<br>GD(a)<br>Tol. + 0.1 | Groove Width<br>GW(c)<br>Tol. + 0.2 | Without Back-up Ring | With Back-up Ring |
|                  |                    |                                          | GW + 0.2<br>Tol. + 0.2 | GW(a)<br>1 BU<br>Tol. + 0.2 | GW(b)<br>2 BU<br>Tol. + 0.2 |                                     |                                     |                      |                   |
| -                | 1.00               | 0.80                                     | 1.40                   | -                           | -                           | 0.65                                | 1.40                                | 0.2                  | 0.2               |
| -                | 1.02               | 0.80                                     | 1.40                   | -                           | -                           | 0.65                                | 1.40                                | 0.2                  | 0.2               |
| -                | 1.10               | 0.90                                     | 1.50                   | -                           | -                           | 0.75                                | 1.50                                | 0.2                  | 0.2               |
| -                | 1.12               | 0.90                                     | 1.50                   | -                           | -                           | 0.75                                | 1.50                                | 0.2                  | 0.2               |
| -                | 1.15               | 0.90                                     | 1.50                   | -                           | -                           | 0.75                                | 1.50                                | 0.2                  | 0.2               |
| -                | 1.20               | 0.95                                     | 1.70                   | -                           | -                           | 0.80                                | 1.70                                | 0.2                  | 0.2               |
| -                | 1.25               | 1.00                                     | 1.70                   | -                           | -                           | 0.80                                | 1.70                                | 0.2                  | 0.2               |
| -                | 1.27               | 1.00                                     | 1.70                   | -                           | -                           | 0.80                                | 1.70                                | 0.2                  | 0.2               |

To determine groove dimensions, [click here](#) to see [pages 109-111](#).

# O-Ring Cord

Below is a list of standard inch cord sizes and available materials. A "√" indicates material availability in a particular size.

**Durometer (Duro) is Shore A.**

## I N C H SIZING CHART



| Nominal Width<br>Inch | Actual Width<br>Inch | Available Materials |              |              |              |                      |                 |                   |              |              |                      |                |            |                    |              |
|-----------------------|----------------------|---------------------|--------------|--------------|--------------|----------------------|-----------------|-------------------|--------------|--------------|----------------------|----------------|------------|--------------------|--------------|
|                       |                      | Duro 90             | Duro 70      | Duro 50      | Duro 40      | Duro 70              | Duro 70         | Duro 70           | Duro 75      | Duro 75      | Duro 90              | Duro 70        | Duro 40    | -                  | Duro 75      |
|                       |                      | Buna-N (NBR)        | Buna-N (NBR) | Buna-N (NBR) | Buna-N (NBR) | Buna-N (NBR) - White | Neoprene® (NEO) | EPDM Rubber (EPD) | Viton® (VIT) | Viton® (VIT) | Viton® (VIT) - Black | Silicone (SIL) | Gum Rubber | Sponge Closed Cell | Aflas® (AFL) |
| 1/16                  | .063 ± .005          |                     | √            |              |              |                      |                 |                   |              |              |                      |                |            |                    |              |
| 1/16                  | .070 ± .007          |                     | √            |              |              |                      |                 | √                 | √            |              |                      | √              |            |                    |              |
| 3/32                  | .093 ± .007          |                     | √            |              |              |                      | √               | √                 | √            |              |                      | √              |            |                    | √            |
| 3/32                  | .103 ± .007          | √                   | √            |              |              |                      | √               | √                 | √            | √            | √                    | √              |            |                    | √            |
| 1/8                   | .125 ± .007          | √                   | √            |              |              |                      | √               | √                 | √            |              | √                    | √              |            | √                  |              |
| 1/8                   | .139 ± .007          | √                   | √            | √            | √            | √                    | √               | √                 | √            | √            | √                    | √              |            |                    | √            |
| 3/16                  | .188 ± .007          |                     | √            |              |              |                      | √               | √                 | √            |              | √                    | √              |            | √                  |              |
| 3/16                  | .210 ± .007          | √                   | √            | √            | √            | √                    | √               | √                 | √            | √            | √                    | √              |            |                    | √            |
| 1/4                   | .250 ± .008          | √                   | √            | √            |              |                      | √               | √                 | √            | √            | √                    | √              |            | √                  | √            |
| 1/4                   | .275 ± .008          | √                   | √            | √            | √            | √                    | √               | √                 | √            | √            | √                    | √              |            |                    | √            |
| 5/16                  | .313 ± .008          | √                   | √            |              |              |                      | √               | √                 | √            | √            | √                    | √              |            | √                  | √            |
| 3/8                   | .375 ± .010          | √                   |              | √            |              | √                    | √               | √                 | √            | √            | √                    | √              | √          | √                  | √            |
| 13/32                 | .406 ± .010          |                     |              |              |              |                      |                 |                   |              |              |                      | √              |            |                    |              |
| 7/16                  | .437 ± .012          | √                   | √            | √            |              | √                    |                 | √                 | √            |              | √                    | √              |            |                    |              |
| 15/32                 | .472 ± .015          |                     | √            | √            |              |                      |                 |                   | √            |              | √                    |                |            |                    |              |
| 1/2                   | .500 ± .015          | √                   | √            | √            |              | √                    | √               | √                 | √            | √            |                      | √              | √          | √                  | √            |
| 9/16                  | .562 ± .015          |                     | √            |              |              |                      | √               | √                 | √            |              |                      |                |            |                    |              |
| 5/8                   | .625 ± .015          |                     | √            | √            |              |                      | √               | √                 | √            |              |                      | √              | √          | √                  |              |
| 3/4                   | .750 ± .015          |                     | √            |              |              |                      | √               | √                 | √            |              |                      | √              | √          | √                  |              |
| 7/8                   | .875 ± .020          |                     | √            |              |              |                      |                 |                   |              |              |                      |                |            |                    |              |
| 1                     | 1.000 ± .020         |                     | √            |              |              |                      |                 |                   | √            |              |                      |                | √          | √                  |              |
| 1-1/16                | 1.062 ± .030         |                     | √            |              |              |                      |                 |                   |              |              |                      |                |            |                    |              |
| 1-1/8                 | 1.125 ± .030         |                     | √            |              |              |                      |                 |                   |              |              |                      |                |            |                    |              |
| 1-1/4                 | 1.250 ± .040         |                     | √            |              |              |                      |                 |                   | √            |              |                      |                |            |                    |              |
| 1-1/2                 | 1.500 ± .060         |                     | √            |              |              |                      |                 |                   |              |              |                      |                |            |                    |              |



## O-Ring Cord

Below is a list of metric cord sizes and available materials. A "√" indicates material availability in a particular size.

**Durometer (Duro) is Shore A.**

# METRIC SIZING CHART



| Width Metric | Width Inch | Available Materials |         |         |         |         |         |         |         |         |  |
|--------------|------------|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|--|
|              |            | Duro 70             | Duro 90 | Duro 70 | Duro 70 | Duro 75 | Duro 90 | Duro 75 | Duro 70 | Duro 75 |  |
| 2.00 ± .10   | .079       | √                   |         |         | √       | √       |         |         | √       |         |  |
| 3.00 ± .12   | .118       | √                   |         |         | √       | √       |         |         | √       |         |  |
| 3.50 ± .15   | .139       | √                   | √       | √       | √       | √       | √       | √       | √       | √       |  |
| 4.00 ± .15   | .158       | √                   |         |         | √       | √       | √       |         | √       |         |  |
| 4.50 ± .15   | .177       | √                   |         |         |         | √       |         |         |         |         |  |
| 5.00 ± .20   | .197       | √                   | √       |         | √       | √       |         |         | √       |         |  |
| 5.70 ± .25   | .224       | √                   | √       | √       | √       | √       |         |         | √       |         |  |
| 6.00 ± .25   | .236       | √                   | √       |         | √       | √       |         |         | √       |         |  |
| 7.00 ± .25   | .275       | √                   | √       | √       | √       | √       | √       | √       | √       | √       |  |
| 7.50 ± .25   | .295       | √                   |         |         |         | √       |         |         |         |         |  |
| 8.50 ± .25   | .335       | √                   |         |         |         | √       |         | √       | √       |         |  |
| 9.00 ± .25   | .354       | √                   |         |         |         | √       |         |         |         |         |  |
| 10.00 ± .25  | .393       | √                   |         |         | √       | √       |         |         | √       |         |  |
| 12.00 ± .45  | .472       | √                   |         |         |         | √       | √       |         |         |         |  |
| 14.00 ± .50  | .550       | √                   |         |         |         | √       |         |         |         |         |  |



## Square Cord

Below is a list of inch square-cut cord sizes and available materials. A "√" indicates material availability in a particular size.

# I N C H

## SIZING CHART

**Durometer is Shore A.**



| Width<br>Inch | Available Materials          |                              |                               |
|---------------|------------------------------|------------------------------|-------------------------------|
|               | Buna-N (NBR)<br>70 Durometer | Viton® (VIT)<br>75 Durometer | Silicone (SIL)<br>70 Duromter |
| .063          |                              |                              |                               |
| .070          |                              |                              |                               |
| .093          |                              |                              |                               |
| .103          | √                            |                              |                               |
| .125          |                              | √                            |                               |
| .139          | √                            |                              |                               |
| .188          |                              | √                            |                               |
| .210          | √                            |                              |                               |
| .250          |                              | √                            | √                             |
| .275          | √                            |                              |                               |
| .313          | √                            | √                            |                               |
| .375          | √                            | √                            | √                             |
| .437          | √                            | √                            |                               |
| .500          | √                            | √                            |                               |
| .625          | √                            | √                            |                               |
| .750          | √                            | √                            |                               |
| .875          |                              |                              |                               |
| 1.000         | √                            |                              |                               |

**Other materials are available in square cross sections.  
Contact your EPM Customer Helper for more information.**

## Q-Lobe Cord

Below is a list of inch quatro ring cord sizes and available materials. A "√" indicates material availability in a particular size.

## I N C H SIZING CHART

Durometer is Shore A.



| Width<br>Inch | Available Materials          |                              |
|---------------|------------------------------|------------------------------|
|               | Buna-N (NBR)<br>70 Durometer | Viton® (VIT)<br>75 Durometer |
|               | .139                         | √                            |
| .210          | √                            | √                            |
| .275          | √                            | √                            |
| .500          |                              | √                            |



# Rectangular Cord

## I N C H SIZING CHART

Below is a list of inch back-up ring cord sizes and available materials. A "✓" indicates material availability in a particular size.



| Inch Size    | Available Materials          |                              |
|--------------|------------------------------|------------------------------|
|              | Buna-N (NBR)<br>70 Durometer | Viton® (VIT)<br>75 Durometer |
| 1/4" x 3/8"  | ✓                            |                              |
| 1/4" x 1/2"  | ✓                            | ✓                            |
| 3/8" x 5/16" |                              | ✓                            |
| 3/8" x 1"    |                              | ✓                            |



# How To Make Spliced, Endless O-Rings Using O-Ring Cord



Laying out tools



Pulling cord from spool



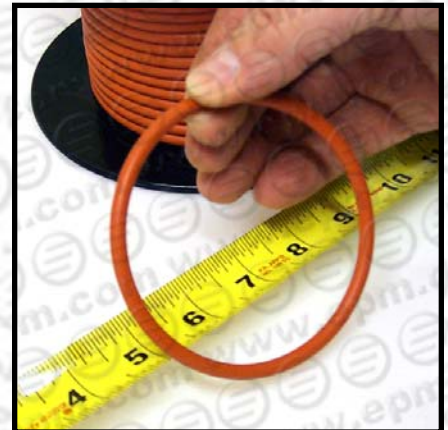
Measuring length of cord



Preparing to cut cord



Cutting O-Ring cord



Finished O-Ring

## O-Ring Cord Cut Length Formula

Use this formula to determine the cut length of the O-Ring cord to achieve a desired inside diameter. Can be used for either millimeters or inches.

$$\left( ( OD + ID ) / 2 \right) \times \text{Pi} = \text{length}$$

Pi = 3.14159

$$ID = OD - ( 2 \times W )$$

Inside Diameter (ID) = Outside Diameter (OD) - twice the width (W)



## Square-Cut Rings

Square-Cut rings are in stock and ready to ship in NBR 70 and VIT 75 durometer materials. However, EPM can make these Square-Cut rings in any material. See [pages 30-36](#) for our [Material Selection Guide](#).

## INCH SIZING CHART

[Click here](#) to see [pages 114-124](#) for an inch sizing chart.

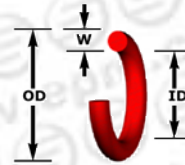


**O-Ring Sizes** - \*All inch sizes are in stock and ready to ship in NBR and VIT materials..

### INCH SIZING CHART (continued)



For [Groove Dimensions](#) see [pages 109-111](#).



| AS568A Dash No. | Nominal Inch Size |        |       | Actual Size (inch) |           | Actual Size (in mm's) |           |
|-----------------|-------------------|--------|-------|--------------------|-----------|-----------------------|-----------|
|                 | I.D.              | O.D.   | Width | I.D.               | Width     | I.D.                  | Width     |
| -021            | 15/16             | 1-1/16 | 1/16  | .926±.009          | .070±.003 | 23.52±0.23            | 1.78±0.08 |
| -022            | 1                 | 1-1/8  | 1/16  | .989±.010          | .070±.003 | 25.12±0.25            | 1.78±0.08 |
| -023            | 1-1/16            | 1-3/16 | 1/16  | 1.051±.010         | .070±.003 | 26.70±0.25            | 1.78±0.08 |
| -024            | 1-1/8             | 1-1/4  | 1/16  | 1.114±.010         | .070±.003 | 28.30±0.25            | 1.78±0.08 |
| -025            | 1-3/16            | 1-5/16 | 1/16  | 1.176±.011         | .070±.003 | 29.87±0.28            | 1.78±0.08 |
| -026            | 1-1/4             | 1-3/8  | 1/32  | 1.239±.011         | .070±.003 | 31.47±0.28            | 1.78±0.08 |
| -027            | 1-5/16            | 1-7/16 | 3/64  | 1.301±.011         | .070±.003 | 33.05±0.28            | 1.78±0.08 |
| -028            | 1-3/8             | 1-1/2  | 1/16  | 1.364±.013         | .070±.003 | 34.65±0.33            | 1.78±0.08 |
| -029            | 1-1/2             | 1-5/8  | 1/16  | 1.489±.013         | .070±.003 | 37.82±0.33            | 1.78±0.08 |
| -030            | 1-5/8             | 1-3/4  | 1/16  | 1.614±.013         | .070±.003 | 41.00±0.33            | 1.78±0.08 |
| -031            | 1-3/4             | 1-7/8  | 1/16  | 1.739±.015         | .070±.003 | 44.17±0.38            | 1.78±0.08 |
| -032            | 1-7/8             | 2      | 1/16  | 1.864±.015         | .070±.003 | 47.35±0.38            | 1.78±0.08 |
| -033            | 2                 | 2-1/8  | 1/16  | 1.989±.018         | .070±.003 | 50.52±0.46            | 1.78±0.08 |
| -034            | 2-1/8             | 2-1/4  | 1/16  | 2.114±.018         | .070±.003 | 53.70±0.46            | 1.78±0.08 |
| -035            | 2-1/4             | 2-3/8  | 1/16  | 2.239±.018         | .070±.003 | 56.87±0.46            | 1.78±0.08 |
| -036            | 2-3/8             | 2-1/2  | 1/16  | 2.364±.018         | .070±.003 | 60.05±0.46            | 1.78±0.08 |
| -037            | 2-1/2             | 2-5/8  | 1/16  | 2.489±.018         | .070±.003 | 63.22±0.46            | 1.78±0.08 |
| -038            | 2-5/8             | 2-3/4  | 1/16  | 2.614±.020         | .070±.003 | 66.40±0.51            | 1.78±0.08 |
| -039            | 2-3/4             | 2-7/8  | 1/16  | 2.739±.020         | .070±.003 | 69.57±0.51            | 1.78±0.08 |
| -040            | 2-7/8             | 3      | 1/16  | 2.864±.020         | .070±.003 | 72.75±0.51            | 1.78±0.08 |
| -041            | 3                 | 3-1/8  | 1/16  | 2.989±.024         | .070±.003 | 75.92±0.61            | 1.78±0.08 |
| -042            | 3-1/4             | 3-3/8  | 1/16  | 3.239±.024         | .070±.003 | 82.27±0.61            | 1.78±0.08 |
| -043            | 3-1/2             | 3-5/8  | 1/16  | 3.489±.024         | .070±.003 | 88.62±0.61            | 1.78±0.08 |
| -044            | 3-3/4             | 3-7/8  | 1/16  | 3.739±.027         | .070±.003 | 94.97±0.69            | 1.78±0.08 |
| -045            | 4                 | 4-1/8  | 1/16  | 3.989±.027         | .070±.003 | 101.32±0.69           | 1.78±0.08 |
| -046            | 4-1/4             | 4-3/8  | 1/16  | 4.239±.030         | .070±.003 | 107.67±0.76           | 1.78±0.08 |
| -047            | 4-1/2             | 4-5/8  | 1/16  | 4.489±.030         | .070±.003 | 114.02±0.76           | 1.78±0.08 |
| -048            | 4-3/4             | 4-7/8  | 1/16  | 4.739±.033         | .070±.003 | 120.37±0.76           | 1.78±0.08 |
| -049            | 5                 | 5-1/8  | 1/16  | 4.989±.033         | .070±.003 | 126.72±0.76           | 1.78±0.08 |
| -050            | 5                 | 5-1/4  | 1/16  | 5.239±.033         | .070±.003 | 133.07±0.76           | 1.78±0.08 |

[Click here](#) to see [pages 114-124](#) for an inch sizing chart.



## Square-Cut Rings

Square-Cut rings are in stock and ready to ship in NBR 70 and VIT 75 durometer materials. However, EPM can make these Square-Cut rings in any material. See [pages 30-36](#) for our [Material Selection Guide](#).

## METRIC SIZING CHART

[Click here](#) to see [pages 125-158](#) for a metric sizing chart.

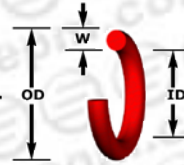


**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

### METRIC SIZING CHART



For [Groove Dimensions](#) see [pages 109-111](#).



| Width (mm)  | I.D. (mm)    | Cross Ref. |
|-------------|--------------|------------|
| 1.00        | 1.15         | -          |
| 1.00        | 1.25         | -          |
| <b>1.00</b> | <b>1.50</b>  | -          |
| 1.00        | 1.80         | -          |
| <b>1.00</b> | <b>2.00</b>  | -          |
| <b>1.00</b> | <b>2.50</b>  | -          |
| 1.00        | 2.70         | -          |
| <b>1.00</b> | <b>3.00</b>  | -          |
| 1.00        | 3.30         | -          |
| <b>1.00</b> | <b>3.50</b>  | -          |
| <b>1.00</b> | <b>4.00</b>  | -          |
| <b>1.00</b> | <b>4.50</b>  | -          |
| <b>1.00</b> | <b>5.00</b>  | -          |
| <b>1.00</b> | <b>5.50</b>  | -          |
| <b>1.00</b> | <b>6.00</b>  | -          |
| <b>1.00</b> | <b>6.50</b>  | -          |
| <b>1.00</b> | <b>7.00</b>  | -          |
| 1.00        | 7.20         | -          |
| <b>1.00</b> | <b>7.50</b>  | -          |
| <b>1.00</b> | <b>8.00</b>  | -          |
| <b>1.00</b> | <b>8.50</b>  | -          |
| <b>1.00</b> | <b>9.00</b>  | -          |
| <b>1.00</b> | <b>9.50</b>  | -          |
| <b>1.00</b> | <b>10.00</b> | -          |
| <b>1.00</b> | <b>10.50</b> | -          |
| <b>1.00</b> | <b>11.00</b> | -          |
| <b>1.00</b> | <b>11.50</b> | -          |
| <b>1.00</b> | <b>12.00</b> | -          |
| <b>1.00</b> | <b>12.50</b> | -          |

| Width (mm)  | I.D. (mm)    | Cross Ref. |
|-------------|--------------|------------|
| <b>1.00</b> | <b>13.50</b> | -          |
| <b>1.00</b> | <b>14.00</b> | -          |
| <b>1.00</b> | <b>14.50</b> | -          |
| <b>1.00</b> | <b>15.00</b> | -          |
| <b>1.00</b> | <b>15.50</b> | -          |
| <b>1.00</b> | <b>16.00</b> | -          |
| <b>1.00</b> | <b>16.50</b> | -          |
| <b>1.00</b> | <b>17.00</b> | -          |
| <b>1.00</b> | <b>17.50</b> | -          |
| <b>1.00</b> | <b>18.00</b> | -          |
| <b>1.00</b> | <b>18.50</b> | -          |
| <b>1.00</b> | <b>19.00</b> | -          |
| <b>1.00</b> | <b>19.50</b> | -          |
| <b>1.00</b> | <b>20.00</b> | -          |
| <b>1.00</b> | <b>20.50</b> | -          |
| <b>1.00</b> | <b>21.00</b> | -          |
| <b>1.00</b> | <b>21.50</b> | -          |
| <b>1.00</b> | <b>22.00</b> | -          |
| <b>1.00</b> | <b>22.50</b> | -          |
| <b>1.00</b> | <b>23.00</b> | -          |
| <b>1.00</b> | <b>23.50</b> | -          |
| <b>1.00</b> | <b>24.00</b> | -          |
| <b>1.00</b> | <b>24.50</b> | -          |
| <b>1.00</b> | <b>25.00</b> | -          |
| 1.00        | 28.00        | -          |
| 1.00        | 29.40        | -          |
| 1.00        | 29.00        | -          |

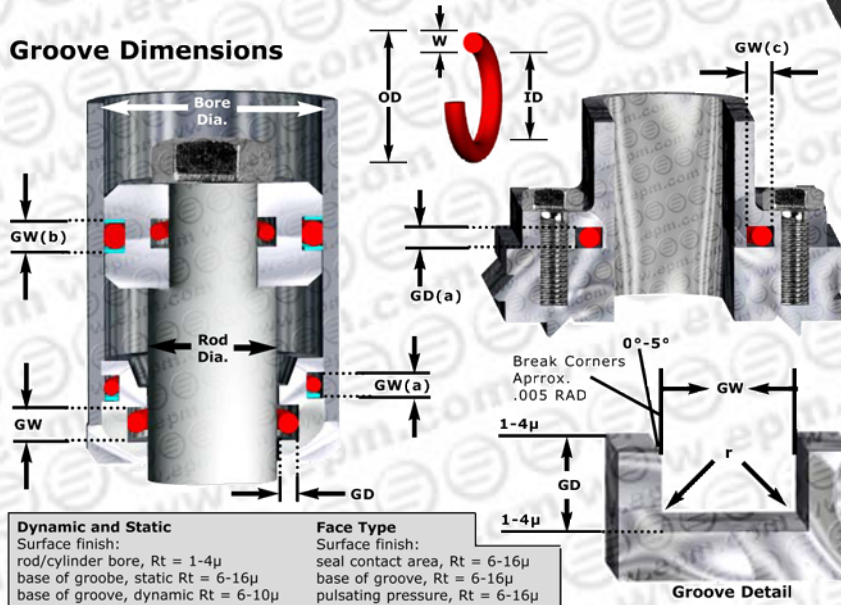
| Width (mm)  | I.D. (mm)    | Cross Ref. |
|-------------|--------------|------------|
| 1.19        | 4.32         | -          |
| 1.20        | 2.50         | -          |
| 1.20        | 2.60         | -          |
| 1.20        | 3.50         | -          |
| 1.20        | 5.00         | -          |
| 1.20        | 24.00        | -          |
| 1.20        | 26.00        | -          |
| 1.20        | 28.00        | -          |
| 1.20        | 35.00        | -          |
| 1.20        | 40.00        | -          |
| 1.20        | 53.50        | -          |
| 1.20        | 98.00        | -          |
| 1.25        | 3.80         | -          |
| 1.25        | 8.00         | -          |
| 1.25        | 16.00        | -          |
| 1.27        | 3.25         | -          |
| 1.27        | 3.91         | -          |
| 1.27        | 4.47         | -          |
| 1.30        | 2.50         | -          |
| 1.30        | 8.00         | -          |
| 1.30        | 10.00        | -          |
| <b>1.30</b> | <b>11.00</b> | -          |
| 1.30        | 13.50        | -          |
| 1.30        | 20.00        | -          |
| 1.80        | 1.80         | -          |

[Click here](#) to see [pages 125-158](#) for a metric sizing chart.

# Square-Cut Rings

## GROOVE DIMENSIONS

To determine groove dimensions, [click here](#) to see [pages 109-111](#).



|                                                                                                                                                         |                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dynamic and Static</b><br>Surface finish:<br>rod/cylinder bore, Rt = 1-4µ<br>base of groove, static Rt = 6-16µ<br>base of groove, dynamic Rt = 6-10µ | <b>Face Type</b><br>Surface finish:<br>seal contact area, Rt = 6-16µ<br>base of groove, Rt = 6-16µ<br>pulsating pressure, Rt = 6-16µ |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|

| Inch O-Ring<br>W | Metric O-Ring<br>W | Groove Depth<br>GD + 0.06<br>Tol. + 0.06 | Dynamic and Static     |                             |                             | Face Type                           |                                     | Radius               |                   |
|------------------|--------------------|------------------------------------------|------------------------|-----------------------------|-----------------------------|-------------------------------------|-------------------------------------|----------------------|-------------------|
|                  |                    |                                          | Groove Width           |                             |                             | Groove Depth<br>GD(a)<br>Tol. + 0.1 | Groove Width<br>GW(c)<br>Tol. + 0.2 | Without Back-up Ring | With Back-up Ring |
|                  |                    |                                          | GW + 0.2<br>Tol. + 0.2 | GW(a)<br>1 BU<br>Tol. + 0.2 | GW(b)<br>2 BU<br>Tol. + 0.2 |                                     |                                     |                      |                   |
| -                | 1.00               | 0.80                                     | 1.40                   | -                           | 0.65                        | 1.40                                | 0.2                                 | 0.2                  |                   |
| -                | 1.02               | 0.80                                     | 1.40                   | -                           | 0.65                        | 1.40                                | 0.2                                 | 0.2                  |                   |
| -                | 1.10               | 0.90                                     | 1.50                   | -                           | 0.75                        | 1.50                                | 0.2                                 | 0.2                  |                   |
| -                | 1.12               | 0.90                                     | 1.50                   | -                           | 0.75                        | 1.50                                | 0.2                                 | 0.2                  |                   |
| -                | 1.15               | 0.90                                     | 1.50                   | -                           | 0.75                        | 1.50                                | 0.2                                 | 0.2                  |                   |
| -                | 1.20               | 0.95                                     | 1.70                   | -                           | 0.80                        | 1.70                                | 0.2                                 | 0.2                  |                   |
| -                | 1.25               | 1.00                                     | 1.70                   | -                           | 0.80                        | 1.70                                | 0.2                                 | 0.2                  |                   |
| -                | 1.27               | 1.00                                     | 1.70                   | -                           | 0.80                        | 1.70                                | 0.2                                 | 0.2                  |                   |

To determine groove dimensions, [click here](#) to see [page 109-111](#).





## Q-Lobe Rings

Q-Lobe rings are in stock and ready to ship in NBR 70 and VIT 75 durometer materials. However, EPM can make these Q-Lobe rings in any material. See [pages 30-36](#) for our [Material Selection Guide](#).

## INCH SIZING CHART

[Click here](#) to see [pages 114-124](#) for an inch sizing chart.



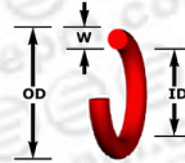
**O-Ring Sizes** - \*All inch sizes are in stock and ready to ship in NBR and VIT materials..

## INCH

SIZING CHART (continued)



For [Groove Dimensions](#) see [pages 109-111](#).



| AS568A<br>Dash<br>No. | Nominal Inch Size |        |       | Actual Size (inch) |           | Actual Size (in mm's) |           |
|-----------------------|-------------------|--------|-------|--------------------|-----------|-----------------------|-----------|
|                       | I.D.              | O.D.   | Width | I.D.               | Width     | I.D.                  | Width     |
| -021                  | 15/16             | 1-1/16 | 1/16  | .926±.009          | .070±.003 | 23.52±0.23            | 1.78±0.08 |
| -022                  | 1                 | 1-1/8  | 1/16  | .989±.010          | .070±.003 | 25.12±0.25            | 1.78±0.08 |
| -023                  | 1-1/16            | 1-3/16 | 1/16  | 1.051±.010         | .070±.003 | 26.70±0.25            | 1.78±0.08 |
| -024                  | 1-1/8             | 1-1/4  | 1/16  | 1.114±.010         | .070±.003 | 28.30±0.25            | 1.78±0.08 |
| -025                  | 1-3/16            | 1-5/16 | 1/16  | 1.176±.011         | .070±.003 | 29.87±0.28            | 1.78±0.08 |
| -026                  | 1-1/4             | 1-3/8  | 1/32  | 1.239±.011         | .070±.003 | 31.47±0.28            | 1.78±0.08 |
| -027                  | 1-5/16            | 1-7/16 | 3/64  | 1.301±.011         | .070±.003 | 33.05±0.28            | 1.78±0.08 |
| -028                  | 1-3/8             | 1-1/2  | 1/16  | 1.364±.013         | .070±.003 | 34.65±0.33            | 1.78±0.08 |
| -029                  | 1-1/2             | 1-5/8  | 1/16  | 1.489±.013         | .070±.003 | 37.82±0.33            | 1.78±0.08 |
| -030                  | 1-5/8             | 1-3/4  | 1/16  | 1.614±.013         | .070±.003 | 41.00±0.33            | 1.78±0.08 |
| -031                  | 1-3/4             | 1-7/8  | 1/16  | 1.739±.015         | .070±.003 | 44.17±0.38            | 1.78±0.08 |
| -032                  | 1-7/8             | 2      | 1/16  | 1.864±.015         | .070±.003 | 47.35±0.38            | 1.78±0.08 |
| -033                  | 2                 | 2-1/8  | 1/16  | 1.989±.018         | .070±.003 | 50.52±0.46            | 1.78±0.08 |
| -034                  | 2-1/8             | 2-1/4  | 1/16  | 2.114±.018         | .070±.003 | 53.70±0.46            | 1.78±0.08 |
| -035                  | 2-1/4             | 2-3/8  | 1/16  | 2.239±.018         | .070±.003 | 56.87±0.46            | 1.78±0.08 |
| -036                  | 2-3/8             | 2-1/2  | 1/16  | 2.364±.018         | .070±.003 | 60.05±0.46            | 1.78±0.08 |
| -037                  | 2-1/2             | 2-5/8  | 1/16  | 2.489±.018         | .070±.003 | 63.22±0.46            | 1.78±0.08 |
| -038                  | 2-5/8             | 2-3/4  | 1/16  | 2.614±.020         | .070±.003 | 66.40±0.51            | 1.78±0.08 |
| -039                  | 2-3/4             | 2-7/8  | 1/16  | 2.739±.020         | .070±.003 | 69.57±0.51            | 1.78±0.08 |
| -040                  | 2-7/8             | 3      | 1/16  | 2.864±.020         | .070±.003 | 72.75±0.51            | 1.78±0.08 |
| -041                  | 3                 | 3-1/8  | 1/16  | 2.989±.024         | .070±.003 | 75.92±0.61            | 1.78±0.08 |
| -042                  | 3-1/4             | 3-3/8  | 1/16  | 3.239±.024         | .070±.003 | 82.27±0.61            | 1.78±0.08 |
| -043                  | 3-1/2             | 3-5/8  | 1/16  | 3.489±.024         | .070±.003 | 88.62±0.61            | 1.78±0.08 |
| -044                  | 3-3/4             | 3-7/8  | 1/16  | 3.739±.027         | .070±.003 | 94.97±0.69            | 1.78±0.08 |
| -045                  | 4                 | 4-1/8  | 1/16  | 3.989±.027         | .070±.003 | 101.32±0.69           | 1.78±0.08 |
| -046                  | 4-1/4             | 4-3/8  | 1/16  | 4.239±.030         | .070±.003 | 107.67±0.76           | 1.78±0.08 |
| -047                  | 4-1/2             | 4-5/8  | 1/16  | 4.489±.030         | .070±.003 | 114.02±0.76           | 1.78±0.08 |
| -048                  | 4-3/4             | 4-7/8  | 1/16  | 4.739±.033         | .070±.003 | 120.37±0.83           | 1.78±0.08 |
| -049                  | 5                 | 5-1/8  | 1/16  | 4.989±.033         | .070±.003 | 126.72±0.83           | 1.78±0.08 |
| -050                  | 5                 | 5-1/8  | 1/16  | 4.989±.033         | .070±.003 | 126.72±0.83           | 1.78±0.08 |

[Click here](#) to see [pages 114-124](#) for an inch sizing chart.

## Q-Lobe Rings

Q-Lobe rings are in stock and ready to ship in NBR 70 and VIT 75 durometer materials. However, EPM can make these Q-Lobe rings in any material. See [pages 30-36](#) for our [Material Selection Guide](#).

## METRIC SIZING CHART

[Click here](#) to see [pages 125-158](#) for a metric sizing chart.

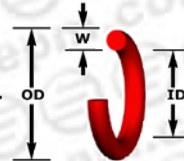


**O-Ring Sizes** - \*Sizes in bold print are in stock and ready to ship in NBR and VIT materials.

### METRIC SIZING CHART



For [Groove Dimensions](#) see [pages 109-111](#).



| Width (mm)  | I.D. (mm)    | Cross Ref. |
|-------------|--------------|------------|
| 1.00        | 1.15         | -          |
| 1.00        | 1.25         | -          |
| <b>1.00</b> | <b>1.50</b>  | -          |
| 1.00        | 1.80         | -          |
| <b>1.00</b> | <b>2.00</b>  | -          |
| <b>1.00</b> | <b>2.50</b>  | -          |
| 1.00        | 2.70         | -          |
| <b>1.00</b> | <b>3.00</b>  | -          |
| 1.00        | 3.30         | -          |
| <b>1.00</b> | <b>3.50</b>  | -          |
| <b>1.00</b> | <b>4.00</b>  | -          |
| <b>1.00</b> | <b>4.50</b>  | -          |
| <b>1.00</b> | <b>5.00</b>  | -          |
| <b>1.00</b> | <b>5.50</b>  | -          |
| <b>1.00</b> | <b>6.00</b>  | -          |
| <b>1.00</b> | <b>6.50</b>  | -          |
| <b>1.00</b> | <b>7.00</b>  | -          |
| 1.00        | 7.20         | -          |
| <b>1.00</b> | <b>7.50</b>  | -          |
| <b>1.00</b> | <b>8.00</b>  | -          |
| <b>1.00</b> | <b>8.50</b>  | -          |
| <b>1.00</b> | <b>9.00</b>  | -          |
| <b>1.00</b> | <b>9.50</b>  | -          |
| <b>1.00</b> | <b>10.00</b> | -          |
| <b>1.00</b> | <b>10.50</b> | -          |
| <b>1.00</b> | <b>11.00</b> | -          |
| <b>1.00</b> | <b>11.50</b> | -          |
| <b>1.00</b> | <b>12.00</b> | -          |
| <b>1.00</b> | <b>12.50</b> | -          |

| Width (mm)  | I.D. (mm)    | Cross Ref. |
|-------------|--------------|------------|
| <b>1.00</b> | <b>13.50</b> | -          |
| <b>1.00</b> | <b>14.00</b> | -          |
| <b>1.00</b> | <b>14.50</b> | -          |
| <b>1.00</b> | <b>15.00</b> | -          |
| <b>1.00</b> | <b>15.50</b> | -          |
| <b>1.00</b> | <b>16.00</b> | -          |
| <b>1.00</b> | <b>16.50</b> | -          |
| <b>1.00</b> | <b>17.00</b> | -          |
| <b>1.00</b> | <b>17.50</b> | -          |
| <b>1.00</b> | <b>18.00</b> | -          |
| <b>1.00</b> | <b>18.50</b> | -          |
| <b>1.00</b> | <b>19.00</b> | -          |
| <b>1.00</b> | <b>19.50</b> | -          |
| <b>1.00</b> | <b>20.00</b> | -          |
| <b>1.00</b> | <b>20.50</b> | -          |
| <b>1.00</b> | <b>21.00</b> | -          |
| <b>1.00</b> | <b>21.50</b> | -          |
| <b>1.00</b> | <b>22.00</b> | -          |
| <b>1.00</b> | <b>22.50</b> | -          |
| <b>1.00</b> | <b>23.00</b> | -          |
| <b>1.00</b> | <b>23.50</b> | -          |
| <b>1.00</b> | <b>24.00</b> | -          |
| <b>1.00</b> | <b>24.50</b> | -          |
| <b>1.00</b> | <b>25.00</b> | -          |
| 1.00        | 28.00        | -          |
| 1.00        | 29.40        | -          |
| 1.00        | 29.00        | -          |

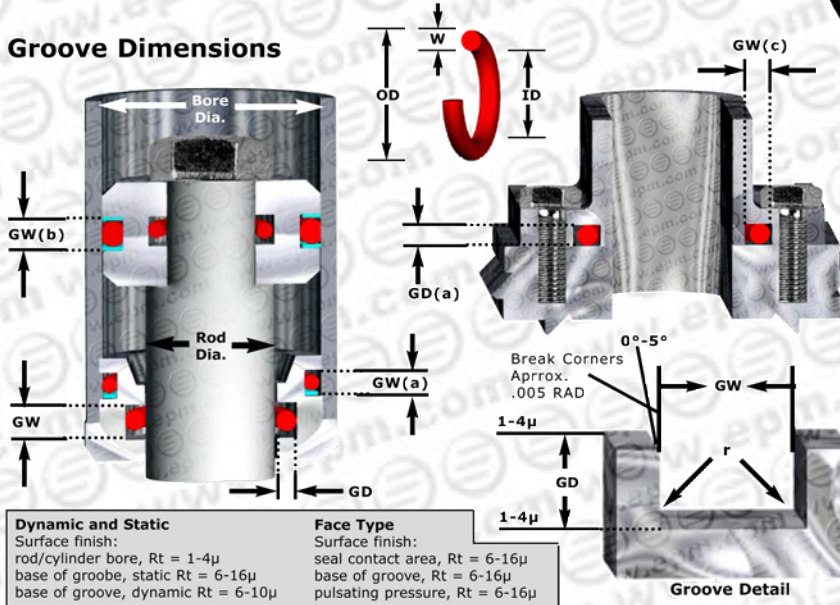
| Width (mm)  | I.D. (mm)    | Cross Ref. |
|-------------|--------------|------------|
| 1.19        | 4.32         | -          |
| 1.20        | 2.50         | -          |
| 1.20        | 2.60         | -          |
| 1.20        | 3.50         | -          |
| 1.20        | 5.00         | -          |
| 1.20        | 24.00        | -          |
| 1.20        | 26.00        | -          |
| 1.20        | 28.00        | -          |
| 1.20        | 35.00        | -          |
| 1.20        | 40.00        | -          |
| 1.20        | 53.50        | -          |
| 1.20        | 98.00        | -          |
| 1.25        | 3.80         | -          |
| 1.25        | 8.00         | -          |
| 1.25        | 16.00        | -          |
| 1.27        | 3.25         | -          |
| 1.27        | 3.91         | -          |
| 1.27        | 4.47         | -          |
| 1.30        | 2.50         | -          |
| 1.30        | 8.00         | -          |
| 1.30        | 10.00        | -          |
| <b>1.30</b> | <b>11.00</b> | -          |
| 1.30        | 13.50        | -          |
| 1.30        | 20.00        | -          |
|             | 1.80         | -          |

[Click here](#) to see [pages 125-158](#) for a metric sizing chart.

# Q-Lobe Rings

## GROOVE DIMENSIONS

To determine groove dimensions, [click here](#) to see [pages 109-111](#).



| Inch O-Ring<br>W | Metric O-Ring<br>W | Groove Depth<br>GD + 0.06<br>Tol. + 0.06 | Dynamic and Static     |                             |                             | Face Type                           |                                     | Radius               |                   |
|------------------|--------------------|------------------------------------------|------------------------|-----------------------------|-----------------------------|-------------------------------------|-------------------------------------|----------------------|-------------------|
|                  |                    |                                          | Groove Width           |                             |                             | Groove Depth<br>GD(a)<br>Tol. + 0.1 | Groove Width<br>GW(c)<br>Tol. + 0.2 | Without Back-up Ring | With Back-up Ring |
|                  |                    |                                          | GW + 0.2<br>Tol. + 0.2 | GW(a)<br>1 BU<br>Tol. + 0.2 | GW(b)<br>2 BU<br>Tol. + 0.2 |                                     |                                     |                      |                   |
| -                | 1.00               | 0.80                                     | 1.40                   | -                           | 0.65                        | 1.40                                | 0.2                                 | 0.2                  |                   |
| -                | 1.02               | 0.80                                     | 1.40                   | -                           | 0.65                        | 1.40                                | 0.2                                 | 0.2                  |                   |
| -                | 1.10               | 0.90                                     | 1.50                   | -                           | 0.75                        | 1.50                                | 0.2                                 | 0.2                  |                   |
| -                | 1.12               | 0.90                                     | 1.50                   | -                           | 0.75                        | 1.50                                | 0.2                                 | 0.2                  |                   |
| -                | 1.15               | 0.90                                     | 1.50                   | -                           | 0.75                        | 1.50                                | 0.2                                 | 0.2                  |                   |
| -                | 1.20               | 0.95                                     | 1.70                   | -                           | 0.80                        | 1.70                                | 0.2                                 | 0.2                  |                   |
| -                | 1.25               | 1.00                                     | 1.70                   | -                           | 0.80                        | 1.70                                | 0.2                                 | 0.2                  |                   |
| -                | 1.27               | 1.00                                     | 1.70                   | -                           | 0.80                        | 1.70                                | 0.2                                 | 0.2                  |                   |

To determine groove dimensions, [click here](#) to see [pages 109-111](#).

## O-Ring Kits & Assortments

Contact your EPM Customer Helper for prices and availability on these O-Ring kits.

### EPM Inch O-Ring Kit

This kit contains a total of 382 O-Rings in 30 different inch sizes, providing an extremely low cost per size value.

Kit contents:

| Part Number  | Quantity |
|--------------|----------|
| -006 to -012 | 20       |
| -110 to -116 | 13       |
| -210 to -222 | 10       |
| -325 to -327 | 7        |



### EPM Metric O-Ring Kit

This metric O-Ring kit contains a total of 386 O-Rings in 30 different metric sizes.

Kit contents:

| I.D. x Width (mm) | Quantity | I.D. x Width (mm) | Quantity |
|-------------------|----------|-------------------|----------|
| 3 x 2.0           | 16       | 20 x 3.0          | 12       |
| 4 x 2.0           | 16       | 22 x 3.0          | 12       |
| 5 x 2.0           | 16       | 24 x 3.0          | 12       |
| 6 x 2.0           | 16       | 25 x 3.0          | 12       |
| 7 x 2.0           | 16       | 27 x 3.0          | 12       |
| 8 x 2.0           | 16       | 28 x 3.0          | 12       |
| 10 x 2.0          | 16       | 30 x 3.0          | 12       |
| 10 x 2.5          | 16       | 32 x 3.0          | 12       |
| 11 x 2.5          | 13       | 33 x 3.0          | 12       |
| 12 x 2.5          | 13       | 35 x 3.0          | 12       |
| 14 x 2.5          | 13       | 36 x 3.0          | 12       |
| 16 x 2.5          | 13       | 38 x 3.0          | 12       |
| 17 x 2.5          | 13       | 38 x 4.0          | 9        |
| 19 x 2.5          | 13       | 41 x 4.0          | 9        |
| 19 x 3.0          | 12       | 44 x 4.0          | 9        |

## O-Ring Kits & Assortments

Contact your EPM Customer Helper for prices and availability on these O-Ring kits.

### Mini Inch O-Ring Kit

This mini inch size kit contains a total of 225 O-Rings in 18 different inch sizes.

Kit contents:

| Part Number | Quantity | Part Number | Quantity |
|-------------|----------|-------------|----------|
| -006        | 20       | -110        | 10       |
| -007        | 20       | -111        | 10       |
| -008        | 20       | -112        | 10       |
| -009        | 15       | -113        | 10       |
| -010        | 15       | -114        | 10       |
| -011        | 15       | -115        | 10       |
| -012        | 10       | -116        | 10       |
| -014        | 10       | -210        | 10       |
| -016        | 10       | -211        | 10       |



### Mini Metric O-Ring Kit

This mini metric size kit contains a total of 225 O-Rings in 18 different metric sizes.

Kit contents:

| I.D. x Width (mm) | Quantity | I.D. x Width (mm) | Quantity |
|-------------------|----------|-------------------|----------|
| 3 x 2.0           | 20       | 10 x 2.5          | 10       |
| 4 x 2.0           | 20       | 11 x 2.5          | 10       |
| 5 x 2.0           | 20       | 12 x 2.5          | 10       |
| 6 x 2.0           | 15       | 14 x 2.5          | 10       |
| 7 x 2.0           | 15       | 16 x 2.5          | 10       |
| 8 x 2.0           | 15       | 17 x 2.5          | 10       |
| 10 x 2.0          | 10       | 19 x 2.5          | 10       |
| 12 x 2.0          | 10       | 19 x 3.0          | 10       |
| 14 x 2.0          | 10       | 20 x 3.0          | 10       |

## O-Ring Kits & Assortments

Contact your EPM Customer Helper for prices and availability on these O-Ring kits.

### U.S. Industrial Inch O-Ring Kit

This kit contains a total of 436 70 Durometer O-Rings in 36 different inch sizes.

Kit contents:

| Part Number  | Quantity | Part Number  | Quantity |
|--------------|----------|--------------|----------|
| -005 to -011 | 25       | -111 to -116 | 10       |
| -012         | 15       | -117 to -121 | 7        |
| -013 to -018 | 10       | -210 to -211 | 10       |
| -110         | 15       | -212 to -219 | 7        |



### 90 Durometer Inch O-Ring Kit

This kit contains a total of 436 90 durometer O-Rings in 36 different inch sizes.

Kit contents:

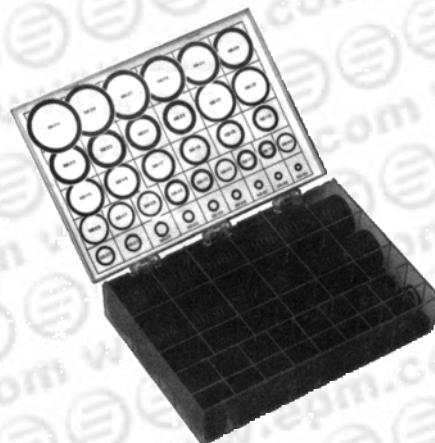
| Part Number  | Quantity | Part Number  | Quantity |
|--------------|----------|--------------|----------|
| -005 to -011 | 25       | -111 to -116 | 10       |
| -012         | 15       | -117 to -121 | 7        |
| -013 to -018 | 10       | -210 to -211 | 10       |
| -110         | 15       | -212 to -219 | 7        |

### Fluorocarbon (Viton®) Inch O-Ring Kit

This kit contains a total of 436 75 Durometer Fluorocarbon O-Rings in 36 different inch sizes.

Kit contents:

| Part Number  | Quantity | Part Number  | Quantity |
|--------------|----------|--------------|----------|
| -005 to -011 | 25       | -111 to -116 | 10       |
| -012         | 15       | -117 to -121 | 7        |
| -013 to -018 | 10       | -210 to -211 | 10       |
| -110         | 15       | -212 to -219 | 7        |



## O-Ring Kits & Assortments

Contact your EPM Customer Helper for prices and availability on these O-Ring kits.

### O-Ring Warehouse Kit

This O-Ring Warehouse kit is ideally suited for the repair shop that needs a large on-hand selection of O-Rings to insure quick repair of all machine types. This kit includes 1,110 O-Rings in 150 different inch sizes. Each size is individually packaged in heavy duty ziploc bags to protect against environmental exposure and contamination. All packages are then stored in a sturdy styrene cabinet with pull-out drawers for easy access to parts. Included card shows size, dimensions, and drawer location for each ring.



Kit contents:

| Part Number  | Quantity | Part Number  | Quantity | Part Number  | Quantity |
|--------------|----------|--------------|----------|--------------|----------|
| -001 to -016 | 20       | -125 to -142 | 5        | -325 to -328 | 5        |
| -017 to -024 | 10       | -143 to -146 | 3        | -329 to -330 | 4        |
| -025 to -031 | 7        | -147 to -151 | 2        | -331 to -338 | 2        |
| -032 to -043 | 5        | -210 to -216 | 10       | -901 to -914 | 5        |
| -044 to -046 | 2        | -217 to -229 | 5        | -916, -918   | 5        |
| -110 to -116 | 15       | -230 to -232 | 3        | -920, -924   | 5        |
| -117 to -124 | 10       | -233 to -237 | 2        | -928, -932   | 5        |

### 90 Durometer O-Ring Warehouse Kit

This kit is similar to the above warehouse kit, except all O-Rings are 90 Durometer. This kit contains 1,110 O-Rings in 150 different inch sizes.

Kit contents:

| Part Number   | Quantity | Part Number  | Quantity |
|---------------|----------|--------------|----------|
| -001 to -016  | 20       | -217 to -229 | 5        |
| -017 to -024  | 10       | -230 to -232 | 3        |
| -025 to -031  | 7        | -233 to -237 | 2        |
| -032 to -043  | 5        | -325 to -328 | 5        |
| -044 to -046  | 2        | -329 to -330 | 4        |
| -0110 to -116 | 15       | -331 to -338 | 2        |
| -117 to -124  | 10       | -901 to -914 | 5        |
| -125 to -142  | 5        | -916, -918   | 5        |
| -143 to -146  | 3        | -920, -924   | 5        |
| -147 to -151  | 2        | -928, -932   | 5        |
| -210 to -216  | 10       |              |          |



## O-Ring Kits & Assortments

Contact your EPM Customer Helper for prices and availability on these O-Ring kits.

### Ultimate Nitrile O-Ring Warehouse Kit

This ultimate O-Ring kit contains a large selection of nitrile O-Rings in a wide variety of inch sizes.

Contact your EPM Customer Helper for more information on this ultimate kit.



**LARGEST  
O-RING KIT  
IN NITRILE**



**LARGEST  
O-RING KIT  
IN VITON®**

### Ultimate Fluorocarbon O-Ring Warehouse Kit

This ultimate O-Ring kit contains a large selection of fluorocarbon (Viton®) O-Rings in a wide variety of inch sizes.

Contact your EPM Customer Helper for more information on this ultimate kit.



## O-Ring Kits & Assortments

Contact your EPM Customer Helper for prices and availability on these O-Ring kits.

### O-Ring Face Kit

This kit contains a total of 155 90 Durometer O-Rings in 8 different inch sizes.

Kit contents:

| Part Number | Quantity | Part Number | Quantity |
|-------------|----------|-------------|----------|
| -011        | 25       | -018        | 20       |
| -012        | 25       | -021        | 15       |
| -014        | 25       | -025        | 10       |
| -016        | 25       | -029        | 10       |



### O-Ring Flange Kit

This kit contains a total of 70, 90 Durometer O-Rings, in 7 different inch sizes.

Kit contents:

| Part Number | Quantity | Part Number | Quantity |
|-------------|----------|-------------|----------|
| -210        | 10       | -225        | 10       |
| -214        | 10       | -228        | 10       |
| -219        | 10       | -232        | 10       |
| -222        | 10       |             |          |

### PTFE O-Ring Kit

This kit contains a total of 325 PTFE O-Rings (55 to 58 Shore D) in 36 different inch sizes. PTFE O-Rings can withstand temperatures up to 500°F and are impervious to a wide range of chemicals.

Kit contents:

| Part Number  | Quantity |
|--------------|----------|
| -005 to -012 | 15       |
| -013 to -018 | 10       |
| -110 to -116 | 10       |
| -117 to -121 | 5        |
| -210 to -219 | 5        |



## O-Ring Kits & Assortments

Contact your EPM Customer Helper for prices and availability on these O-Ring kits.

### 900 Boss O-Ring Kit

This 250 piece assortment contains the most popular size 90 Durometer Boss O-Rings, individually boxed.

Kit contents:

| Part Number  | Quantity | Part Number  | Quantity |
|--------------|----------|--------------|----------|
| -904         | 35       | -911 to -914 | 15       |
| -905 to -906 | 30       | -916         | 15       |
| -907 to -910 | 20       |              |          |



### 900 Boss Fluorocarbon (Viton®) O-Ring Kit

This 250 piece assortment contains the most popular size 90 Durometer O-Rings, individually boxed.

Kit contents:

| Part Number  | Quantity | Part Number  | Quantity |
|--------------|----------|--------------|----------|
| -904         | 35       | -911 to -914 | 15       |
| -905 to -906 | 30       | -916         | 15       |
| -907 to -910 | 20       |              |          |



### CAT Silicone O-Ring Kit

This kit, in an unbreakable box, contains 149 silicone O-Rings in the 32 most popular sized used on Caterpillar® equipment.

### CAT Nitrile O-Ring Kit

This kit, in an unbreakable box, contains 570 nitrile O-Rings in the 32 most popular sizes used on Caterpillar® equipment.



## O-Ring Kits & Assortments

Contact your EPM Customer Helper for prices and availability on these O-Ring kits.

### European Size O-Ring Kit (70 Durometer)

This 500 piece kit contains the most popular European metric O-Ring sizes.

Kit contents:

| I.D. | Width | Quantity |
|------|-------|----------|
| 5.0  | 1.5   | 20       |
| 13.0 | 1.5   | 15       |
| 16.0 | 1.5   | 10       |
| 2.2  | 1.6   | 20       |
| 3.1  | 1.6   | 20       |
| 4.1  | 1.6   | 20       |
| 7.1  | 1.6   | 20       |
| 9.1  | 1.6   | 15       |
| 10.1 | 1.6   | 15       |
| 13.1 | 1.6   | 15       |
| 4.0  | 2.0   | 20       |
| 8.0  | 2.0   | 15       |
| 9.0  | 2.0   | 15       |
| 10.0 | 2.0   | 15       |

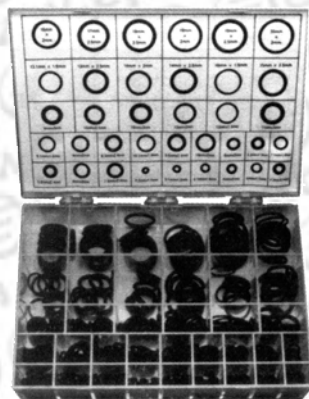
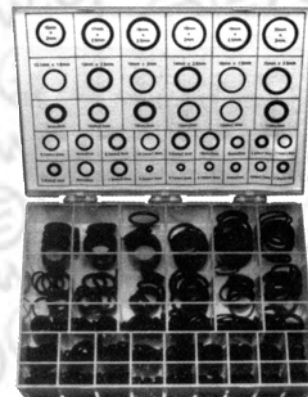
|      |     |    |
|------|-----|----|
| 5.0  | 1.5 | 20 |
| 13.0 | 1.5 | 15 |
| 16.0 | 1.5 | 10 |
| 2.2  | 1.6 | 20 |
| 3.1  | 1.6 | 20 |
| 4.1  | 1.6 | 20 |
| 7.1  | 1.6 | 20 |
| 9.1  | 1.6 | 15 |
| 10.1 | 1.6 | 15 |
| 13.1 | 1.6 | 15 |
| 4.0  | 2.0 | 20 |
| 8.0  | 2.0 | 15 |
| 9.0  | 2.0 | 15 |
| 10.0 | 2.0 | 15 |

| I.D. | Width | Quantity |
|------|-------|----------|
| 12.0 | 2.0   | 15       |
| 14.0 | 2.0   | 10       |
| 16.0 | 2.0   | 10       |
| 19.0 | 2.0   | 10       |
| 20.0 | 2.0   | 10       |
| 4.3  | 2.4   | 15       |
| 5.3  | 2.4   | 15       |
| 5.6  | 2.4   | 15       |
| 6.0  | 2.4   | 20       |
| 7.6  | 2.4   | 15       |
| 8.3  | 2.4   | 15       |
| 8.6  | 2.4   | 15       |
| 10.0 | 2.5   | 10       |
| 13.0 | 2.5   | 10       |

|      |     |    |
|------|-----|----|
| 12.0 | 2.0 | 15 |
| 14.0 | 2.0 | 10 |
| 16.0 | 2.0 | 10 |
| 19.0 | 2.0 | 10 |
| 20.0 | 2.0 | 10 |
| 4.3  | 2.4 | 15 |
| 5.3  | 2.4 | 15 |
| 5.6  | 2.4 | 15 |
| 6.0  | 2.4 | 20 |
| 7.6  | 2.4 | 15 |
| 8.3  | 2.4 | 15 |
| 8.6  | 2.4 | 15 |
| 10.0 | 2.5 | 10 |
| 13.0 | 2.5 | 10 |

| I.D. | Width | Quantity |
|------|-------|----------|
| 14.0 | 2.5   | 10       |
| 15.0 | 2.5   | 10       |
| 17.0 | 2.5   | 10       |
| 18.0 | 2.5   | 10       |
| 19.0 | 2.5   | 10       |
| 9.0  | 3.0   | 10       |
| 10.0 | 3.0   | 10       |
| 11.0 | 3.0   | 10       |

|      |     |    |
|------|-----|----|
| 14.0 | 2.5 | 10 |
| 15.0 | 2.5 | 10 |
| 17.0 | 2.5 | 10 |
| 18.0 | 2.5 | 10 |
| 19.0 | 2.5 | 10 |
| 9.0  | 3.0 | 10 |
| 10.0 | 3.0 | 10 |
| 11.0 | 3.0 | 10 |



### European Size O-Ring Kit (90 Durometer)

This 500 piece kit contains the most popular European metric O-Ring sizes.

Kit contents:

| I.D. | Width | Quantity |
|------|-------|----------|
| 5.0  | 1.5   | 20       |
| 13.0 | 1.5   | 15       |
| 16.0 | 1.5   | 10       |
| 2.2  | 1.6   | 20       |
| 3.1  | 1.6   | 20       |
| 4.1  | 1.6   | 20       |
| 7.1  | 1.6   | 20       |
| 9.1  | 1.6   | 15       |

|      |     |    |
|------|-----|----|
| 5.0  | 1.5 | 20 |
| 13.0 | 1.5 | 15 |
| 16.0 | 1.5 | 10 |
| 2.2  | 1.6 | 20 |
| 3.1  | 1.6 | 20 |
| 4.1  | 1.6 | 20 |
| 7.1  | 1.6 | 20 |
| 9.1  | 1.6 | 15 |

| I.D. | Width | Quantity |
|------|-------|----------|
| 10.1 | 1.6   | 15       |
| 13.1 | 1.6   | 15       |
| 4.0  | 2.0   | 20       |
| 6.0  | 2.0   | 20       |
| 8.0  | 2.0   | 15       |
| 9.0  | 2.0   | 15       |
| 10.0 | 2.0   | 15       |
| 12.0 | 2.0   | 15       |
| 14.0 | 2.0   | 10       |
| 16.0 | 2.0   | 10       |
| 19.0 | 2.0   | 10       |
| 20.0 | 2.0   | 10       |
| 4.3  | 2.4   | 15       |
| 5.3  | 2.4   | 15       |

|      |     |    |
|------|-----|----|
| 10.1 | 1.6 | 15 |
| 13.1 | 1.6 | 15 |
| 4.0  | 2.0 | 20 |
| 6.0  | 2.0 | 20 |
| 8.0  | 2.0 | 15 |
| 9.0  | 2.0 | 15 |
| 10.0 | 2.0 | 15 |
| 12.0 | 2.0 | 15 |
| 14.0 | 2.0 | 10 |
| 16.0 | 2.0 | 10 |
| 19.0 | 2.0 | 10 |
| 20.0 | 2.0 | 10 |
| 4.3  | 2.4 | 15 |
| 5.3  | 2.4 | 15 |

| I.D. | Width | Quantity |
|------|-------|----------|
| 5.6  | 2.4   | 15       |
| 7.6  | 2.4   | 15       |
| 8.3  | 2.4   | 15       |
| 8.6  | 2.4   | 15       |
| 10.0 | 2.5   | 10       |
| 13.0 | 2.5   | 10       |
| 14.0 | 2.5   | 10       |
| 15.0 | 2.5   | 10       |
| 17.0 | 2.5   | 10       |
| 18.0 | 2.5   | 10       |
| 19.0 | 2.5   | 10       |
| 9.0  | 3.0   | 10       |
| 10.0 | 3.0   | 10       |
| 11.0 | 3.0   | 10       |

|      |     |    |
|------|-----|----|
| 5.6  | 2.4 | 15 |
| 7.6  | 2.4 | 15 |
| 8.3  | 2.4 | 15 |
| 8.6  | 2.4 | 15 |
| 10.0 | 2.5 | 10 |
| 13.0 | 2.5 | 10 |
| 14.0 | 2.5 | 10 |
| 15.0 | 2.5 | 10 |
| 17.0 | 2.5 | 10 |
| 18.0 | 2.5 | 10 |
| 19.0 | 2.5 | 10 |
| 9.0  | 3.0 | 10 |
| 10.0 | 3.0 | 10 |
| 11.0 | 3.0 | 10 |

## O-Ring Kits & Assortments

Contact your EPM Customer Helper for prices and availability on these O-Ring kits.

### Japanese Size O-Ring Kit (70 Durometer)

This 380 piece kit contains the most popular Japanese Industrial metric O-Ring sizes.



Kit contents:

| I.D. | Width | Quantity |
|------|-------|----------|
| 2.8  | 1.9   | 25       |
| 3.8  | 1.9   | 20       |
| 4.8  | 1.9   | 20       |
| 5.8  | 1.9   | 20       |
| 6.8  | 1.9   | 15       |
| 7.8  | 1.9   | 15       |
| 8.8  | 1.9   | 15       |
| 9.8  | 1.9   | 15       |
| 9.8  | 2.4   | 15       |
| 10.8 | 2.4   | 15       |
| 11.0 | 2.4   | 15       |
| 11.8 | 2.4   | 12       |
| 12.8 | 2.4   | 12       |
| 13.8 | 2.4   | 12       |
| 14.8 | 2.4   | 12       |
| 15.8 | 2.4   | 12       |
| 17.8 | 2.4   | 8        |
| 19.8 | 2.4   | 8        |
| 20.8 | 2.4   | 8        |
| 21.8 | 2.4   | 8        |
| 24.4 | 3.1   | 6        |
| 29.4 | 3.1   | 7        |
| 21.7 | 3.5   | 5        |
| 22.1 | 3.5   | 5        |
| 23.7 | 3.5   | 7        |
| 24.7 | 3.5   | 7        |
| 25.2 | 3.5   | 7        |
| 25.7 | 3.5   | 7        |
| 27.7 | 3.5   | 7        |
| 28.7 | 3.5   | 6        |
| 29.2 | 3.5   | 6        |
| 29.7 | 3.5   | 6        |
| 30.7 | 3.5   | 6        |
| 31.2 | 3.5   | 6        |
| 14.5 | 4.0   | 4        |
| 23.5 | 4.0   | 6        |

| I.D. | Width | Quantity |
|------|-------|----------|
| 2.8  | 1.9   | 25       |
| 3.8  | 1.9   | 20       |
| 4.8  | 1.9   | 20       |
| 5.8  | 1.9   | 20       |
| 6.8  | 1.9   | 15       |
| 7.8  | 1.9   | 15       |
| 8.8  | 1.9   | 15       |
| 9.8  | 1.9   | 15       |
| 9.8  | 2.4   | 15       |
| 10.8 | 2.4   | 15       |
| 11.0 | 2.4   | 15       |
| 11.8 | 2.4   | 12       |
| 12.8 | 2.4   | 12       |
| 13.8 | 2.4   | 12       |
| 14.8 | 2.4   | 12       |
| 15.8 | 2.4   | 12       |
| 17.8 | 2.4   | 8        |
| 19.8 | 2.4   | 8        |
| 20.8 | 2.4   | 8        |
| 21.8 | 2.4   | 8        |
| 24.4 | 3.1   | 6        |
| 29.4 | 3.1   | 7        |
| 21.7 | 3.5   | 5        |
| 22.1 | 3.5   | 5        |
| 23.7 | 3.5   | 7        |
| 24.7 | 3.5   | 7        |
| 25.2 | 3.5   | 7        |
| 25.7 | 3.5   | 7        |
| 27.7 | 3.5   | 7        |
| 28.7 | 3.5   | 6        |
| 29.2 | 3.5   | 6        |
| 29.7 | 3.5   | 6        |
| 30.7 | 3.5   | 6        |
| 31.2 | 3.5   | 6        |
| 14.5 | 4.0   | 4        |
| 23.5 | 4.0   | 6        |

| I.D. | Width | Quantity |
|------|-------|----------|
| 2.8  | 1.9   | 25       |
| 3.8  | 1.9   | 20       |
| 4.8  | 1.9   | 20       |
| 5.8  | 1.9   | 20       |
| 6.8  | 1.9   | 15       |
| 7.8  | 1.9   | 15       |
| 8.8  | 1.9   | 15       |
| 9.8  | 1.9   | 15       |
| 9.8  | 2.4   | 15       |
| 10.8 | 2.4   | 15       |
| 11.0 | 2.4   | 15       |
| 11.8 | 2.4   | 12       |
| 12.8 | 2.4   | 12       |
| 13.8 | 2.4   | 12       |
| 14.8 | 2.4   | 12       |
| 15.8 | 2.4   | 12       |
| 17.8 | 2.4   | 8        |
| 19.8 | 2.4   | 8        |
| 20.8 | 2.4   | 8        |
| 21.8 | 2.4   | 8        |
| 24.4 | 3.1   | 6        |
| 29.4 | 3.1   | 7        |
| 21.7 | 3.5   | 5        |
| 22.1 | 3.5   | 5        |
| 23.7 | 3.5   | 7        |
| 24.7 | 3.5   | 7        |
| 25.2 | 3.5   | 7        |
| 25.7 | 3.5   | 7        |
| 27.7 | 3.5   | 7        |
| 28.7 | 3.5   | 6        |
| 29.2 | 3.5   | 6        |
| 29.7 | 3.5   | 6        |
| 30.7 | 3.5   | 6        |
| 31.2 | 3.5   | 6        |
| 14.5 | 4.0   | 4        |
| 23.5 | 4.0   | 6        |



### Japanese Size O-Ring Kit (90 Durometer)

This 380 piece kit contains the most popular Japanese Industrial metric O-Ring sizes in 90 Durometer NBR.

Kit contents:

| I.D. | Width | Quantity |
|------|-------|----------|
| 9.8  | 2.4   | 15       |
| 10.8 | 2.4   | 15       |
| 11.0 | 2.4   | 15       |
| 11.8 | 2.4   | 12       |
| 12.8 | 2.4   | 12       |
| 13.8 | 2.4   | 12       |
| 14.8 | 2.4   | 12       |
| 15.8 | 2.4   | 12       |
| 17.8 | 2.4   | 8        |
| 19.8 | 2.4   | 8        |
| 20.8 | 2.5   | 8        |
| 21.8 | 2.4   | 8        |
| 24.4 | 3.1   | 6        |
| 29.4 | 3.1   | 7        |
| 21.7 | 3.5   | 5        |
| 22.1 | 3.5   | 5        |
| 23.7 | 3.5   | 7        |
| 24.7 | 3.5   | 7        |
| 25.2 | 3.5   | 7        |
| 25.7 | 3.5   | 7        |
| 27.7 | 3.5   | 7        |
| 28.7 | 3.5   | 6        |
| 29.2 | 3.5   | 6        |
| 29.7 | 3.5   | 6        |
| 30.7 | 3.5   | 6        |
| 31.2 | 3.5   | 6        |
| 14.5 | 4.0   | 4        |
| 23.5 | 4.0   | 6        |

| I.D. | Width | Quantity |
|------|-------|----------|
| 9.8  | 2.4   | 15       |
| 10.8 | 2.4   | 15       |
| 11.0 | 2.4   | 15       |
| 11.8 | 2.4   | 12       |
| 12.8 | 2.4   | 12       |
| 13.8 | 2.4   | 12       |
| 14.8 | 2.4   | 12       |
| 15.8 | 2.4   | 12       |
| 17.8 | 2.4   | 8        |
| 19.8 | 2.4   | 8        |
| 20.8 | 2.5   | 8        |
| 21.8 | 2.4   | 8        |
| 24.4 | 3.1   | 6        |
| 29.4 | 3.1   | 7        |
| 21.7 | 3.5   | 5        |
| 22.1 | 3.5   | 5        |
| 23.7 | 3.5   | 7        |
| 24.7 | 3.5   | 7        |
| 25.2 | 3.5   | 7        |
| 25.7 | 3.5   | 7        |
| 27.7 | 3.5   | 7        |
| 28.7 | 3.5   | 6        |
| 29.2 | 3.5   | 6        |
| 29.7 | 3.5   | 6        |
| 30.7 | 3.5   | 6        |
| 31.2 | 3.5   | 6        |
| 14.5 | 4.0   | 4        |
| 23.5 | 4.0   | 6        |

| I.D. | Width | Quantity |
|------|-------|----------|
| 9.8  | 2.4   | 15       |
| 10.8 | 2.4   | 15       |
| 11.0 | 2.4   | 15       |
| 11.8 | 2.4   | 12       |
| 12.8 | 2.4   | 12       |
| 13.8 | 2.4   | 12       |
| 14.8 | 2.4   | 12       |
| 15.8 | 2.4   | 12       |
| 17.8 | 2.4   | 8        |
| 19.8 | 2.4   | 8        |
| 20.8 | 2.5   | 8        |
| 21.8 | 2.4   | 8        |
| 24.4 | 3.1   | 6        |
| 29.4 | 3.1   | 7        |
| 21.7 | 3.5   | 5        |
| 22.1 | 3.5   | 5        |
| 23.7 | 3.5   | 7        |
| 24.7 | 3.5   | 7        |
| 25.2 | 3.5   | 7        |
| 25.7 | 3.5   | 7        |
| 27.7 | 3.5   | 7        |
| 28.7 | 3.5   | 6        |
| 29.2 | 3.5   | 6        |
| 29.7 | 3.5   | 6        |
| 30.7 | 3.5   | 6        |
| 31.2 | 3.5   | 6        |
| 14.5 | 4.0   | 4        |
| 23.5 | 4.0   | 6        |



## O-Ring Kits & Assortments

Contact your EPM Customer Helper for prices and availability on these O-Ring kits.

### Max O-Ring Kits

These sturdy kits, packaged in a heavy duty box, contain 1,415 O-Rings in the most popular sizes. Five internal boxes contain 1/16" width, 3/32" width, 1/8" width, Boss and Flange fitting O-Rings.



Kit contents:

#### FLANGE SEALS

| Flange Number | Quantity |
|---------------|----------|
| 8             | 10       |
| 12            | 10       |
| 16            | 10       |
| 20            | 5        |
| 24            | 5        |
| 32            | 5        |

#### Boss O-Rings

| Boss Number | Quantity |
|-------------|----------|
| -903        | 15       |
| -904        | 25       |
| -906        | 15       |
| -906        | 25       |
| -907        | 25       |
| -910        | 25       |
| -912        | 15       |
| -916        | 10       |

#### 1/16" Width

| O-Ring Number | Quantity |
|---------------|----------|
| -006 to -118  | 25       |
| -019 to -021  | 20       |
| -022 to -026  | 15       |
| -028          | 15       |
| -029          | 10       |
| -030          | 10       |

#### 3/32" Width

| O-Ring Number | Quantity |
|---------------|----------|
| -109 to -118  | 25       |
| -119 to -120  | 20       |
| -121 to -127  | 15       |
| -128          | 10       |
| -129          | 10       |
| -131          | 10       |
| -133          | 10       |
| -135          | 5        |

#### 1/8" Width O-Rings

| O-Ring Number | Quantity |
|---------------|----------|
| -210 to -214  | 20       |
| -215 to -222  | 15       |
| -223 to -224  | 10       |
| -226          | 10       |
| -228          | 10       |
| -232          | 10       |
| -236          | 10       |

## O-Ring Kits & Assortments

Contact your EPM Customer Helper for prices and availability on these O-Ring kits.

### Q-Lobe Ring Kit

This kit contains a total of 226 Q-Lobe rings (four-lobed rings) in 36 different inch sizes.

Kit contents:

| Part Number    | Quantity | Part Number    | Quantity |
|----------------|----------|----------------|----------|
| -4005 to -4012 | 10       | -4118 to -4116 | 6        |
| -4013 to -4016 | 6        | -4117 to -4121 | 4        |
| -4017 to -4018 | 5        | -4210 to -4219 | 5        |



### Q-Lobe Ring Warehouse Kit

This Q-Lobe Ring kit contains a total of 583 four-lobed seals in 145 different inch sizes.

Kit contents:

| Part Number    | Quantity | Part Number    | Quantity |
|----------------|----------|----------------|----------|
| -4004 to -4012 | 10       | -4125 to -4135 | 3        |
| -4013 to -4030 | 5        | -4136 to -4154 | 2        |
| -4031 to -4038 | 3        | -4204 to -4216 | 5        |
| -4039 to -4048 | 2        | -4217 to -4229 | 3        |
| -4108 to -4116 | 10       | -4230 to -4338 | 2        |
| -4117 to -4124 | 5        |                |          |



## O-Ring Kits & Assortments

Contact your EPM Customer Helper for prices and availability on these O-Ring kits.

### O-Ring Splice Kit (Inch Sizes)

Kit contents:

1. Stock of 70 durometer nitrile O-Ring cord
2. Razor blade
3. Splicing tool
4. Tube of adhesive

\*EPM can supply additional O-Ring cord. Ask your EPM Customer Helper or see [pages 200-201](#) for more information.



### O-Ring Splice Kit (Metric & Inch Sizes)

This kit can produce O-Rings of any standard inch size width plus a wide variety of metric sizes.

Kit contents:

1. Quick drying adhesive
2. Cutting & splicing jig
3. Razor blade
4. 14 lengths of 70 Durometer nitrile cord stock

#### Inch widths included:

1/16" (.070), 3/32" (.103), 1/8" (.139), 3/16" (.210), 1/4" (.275)

#### Metric widths included (mm):

1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 5.7, 8.4

### Fluorocarbon O-Ring Splice Kit (Inch Sizes)

Kit contents:

1. Stock of 75 durometer fluorocarbon cord
2. Razor blade
3. Splicing tool
4. Tube of adhesive

\*EPM can supply additional O-Ring cord in a number of sizes and materials. Ask your EPM Customer Helper or see [pages 200-201](#) for more information.



## O-Ring Kits & Assortments

Contact your EPM Customer Helper for prices and availability on these O-Ring kits.

### 574 Back-up Ring Kit

This 293 piece kit contains 36 of the most popular inch size "Parback®" Style Dished Cross Section back-up rings. Molded of 90A durometer nitrile rubber, they stretch for installation and return quickly to their original size. Sizes correspond to O-Ring dash numbers.



Kit contents:

| Part Number | Quantity | Part Number | Quantity | Part Number | Quantity |
|-------------|----------|-------------|----------|-------------|----------|
| 574-005     | 10       | 574-017     | 10       | 574-120     | 5        |
| 574-006     | 10       | 574-018     | 10       | 574-121     | 5        |
| 574-007     | 10       | 574-110     | 10       | 574-210     | 7        |
| 574-008     | 10       | 574-111     | 10       | 574-211     | 7        |
| 574-009     | 10       | 574-112     | 10       | 574-212     | 7        |
| 574-010     | 10       | 574-113     | 10       | 574-213     | 7        |
| 574-011     | 10       | 574-114     | 10       | 574-214     | 5        |
| 574-012     | 10       | 574-115     | 10       | 574-215     | 5        |
| 574-013     | 10       | 574-116     | 10       | 574-216     | 5        |
| 574-014     | 10       | 574-117     | 5        | 574-217     | 5        |
| 574-015     | 10       | 574-118     | 5        | 574-218     | 5        |
| 574-016     | 10       | 574-119     | 5        | 574-219     | 5        |

### 575 Back-up Ring Kit

This 475 piece kit contains 24 of the most popular inch size urethane back-up rings.

Kit contents:



| Part Number | Quantity | Part Number | Quantity |
|-------------|----------|-------------|----------|
| 575-111     | 25       | 575-216     | 25       |
| 575-112     | 25       | 575-217     | 15       |
| 575-113     | 25       | 575-218     | 15       |
| 575-114     | 25       | 575-219     | 15       |
| 575-115     | 25       | 575-220     | 15       |
| 575-116     | 25       | 575-221     | 15       |
| 575-210     | 25       | 575-222     | 15       |
| 575-211     | 25       | 575-223     | 15       |
| 575-212     | 25       | 575-224     | 15       |
| 575-213     | 25       | 575-325     | 10       |
| 575-214     | 25       | 575-326     | 10       |
| 575-215     | 25       | 575-327     | 10       |





## O-Ring Kits & Assortments

Contact your EPM Customer Helper for prices and availability on these O-Ring kits.

### PTFE Back-up Ring Kit

This 325 piece kit contains 36 of the most popular size PTFE back-up rings. These rings are compatible with all hydraulic fluids, since they are virtually chemically inert, and can be used in applications involving elevated operating temperatures. These rings are scar cut to facilitate installation.



Kit contents:

| Part Number | Quantity | Part Number | Quantity | Part Number | Quantity |
|-------------|----------|-------------|----------|-------------|----------|
| 575-005     | 15       | 575-017     | 10       | 575-120     | 5        |
| 575-006     | 15       | 575-018     | 10       | 575-121     | 5        |
| 575-007     | 15       | 575-110     | 10       | 575-210     | 5        |
| 575-008     | 15       | 575-111     | 10       | 575-211     | 5        |
| 575-009     | 15       | 575-112     | 10       | 575-212     | 5        |
| 575-010     | 15       | 575-113     | 10       | 575-213     | 5        |
| 575-011     | 15       | 575-114     | 10       | 575-214     | 5        |
| 575-012     | 15       | 575-115     | 10       | 575-215     | 5        |
| 575-013     | 10       | 575-116     | 10       | 575-216     | 5        |
| 575-014     | 10       | 575-117     | 5        | 575-217     | 5        |
| 575-015     | 10       | 575-118     | 5        | 575-218     | 5        |
| 575-016     | 10       | 575-119     | 5        | 575-219     | 5        |

## O-Ring Tools

Contact your EPM Customer Helper for prices and availability on these O-Ring tools.

### O-Ring Measuring Cone

Handy cone provides O-Ring dash numbers instantly. Measures 184 of the most widely used sizes in 5 standard widths, 1/4" ID to 5-5/8" ID. Made of high density polyurethane, the cone stands 17-1/2" high.



### O-Ring Sizing Chart

Durable, accurate, and fast, this chart allows for easy standard O-Ring size identification.



### O-Ring Pick Set 1

These bronze O-Ring picks, with black vinyl case, aid in the installation and extraction of O-Ring.



### O-Ring Pick Set 2

Available in brass or stainless steel, these tools have been specifically engineered to enhance O-Ring removal and replacement. Coated handles increase the tools performance in less than perfect environments.



### O-Ring Pick Set 3

Packaged in a clear vinyl pouch, kit contains a knurled handle and four screw-in picks with different hook configurations. Set includes straight tip, O-Ring 90° tip, hook tip, and angle tip.

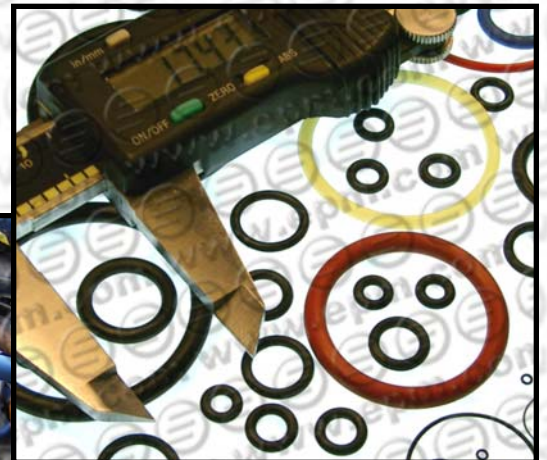
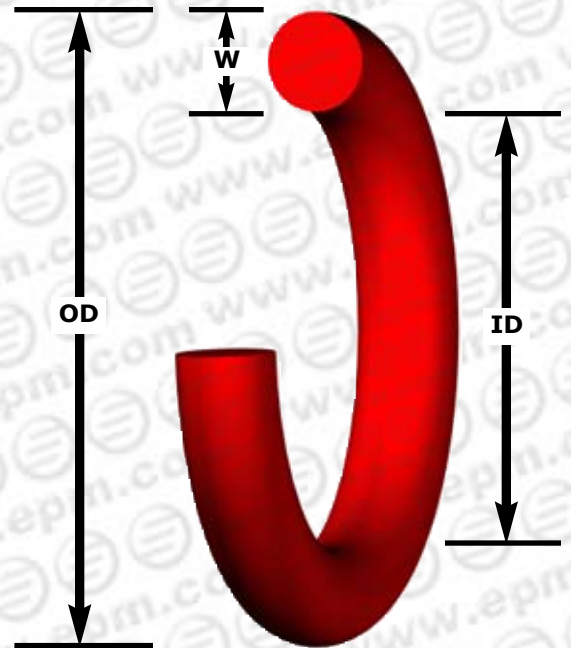


### O-Ring Pick Set 4

Packaged in a plastic pouch, these highly visible picks feature screwdriver-type colored handles. Set includes awl, hook tip, 45° bent tip tool, and 90° bent tip tool.

## How To Order The O-Ring You Need

- What is the inside diameter?
- What is the width (or cross section)?
- Is it an inch size or a metric size?
- What is the material?
- What is the hardness of the material?
- How many do you need?





## How To Select The Material You Need

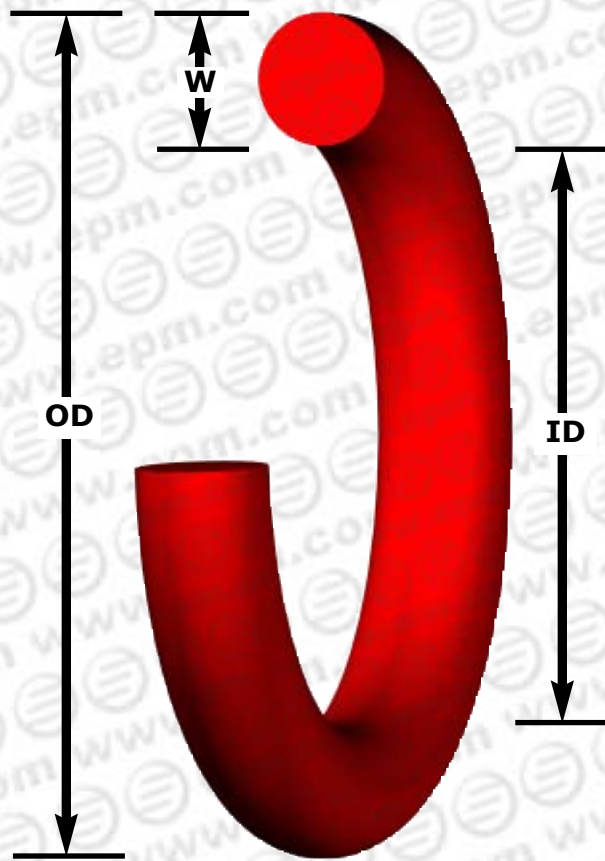
### **S.T.A.M.P.S.**

- An Easy To Remember Term -

(**'S'**ize, **'T'**emperature, **'A'**pplication, **'M'**edia, **'P'**ressure, **'S'**peed)

This information will be used by your EPM Custom Helper to aid you in your selection of an O-Ring for your particular application.

- S**- What is the size of the O-Ring?  
See [Inch Sizes](#), [Metric Sizes](#), or [Groove Dimensions](#).
- T**- What is the temperature of the product being sealed in °C or °F?  
See [Temperature Range](#)
- A**- What is the application action?  
What is the type of equipment (pump, valve, mixer, etc.)?  
Reciprocating?           Static?  
Rotary?                    Combination?
- M**- What is the media/material to be sealed? (solvent, acid, caustic, abrasive?)  
See [Fluid Compatibility Guide](#)
- P**- What is the actual operating pressure?
- S**- What is the speed in fpm (feet per minute) or rpm (revolutions per minute)?  
See [Surface Speed Limitations](#)



### What country did my O-Ring come from?

| Country | Reference Numbers        |
|---------|--------------------------|
| England | BS 1806 & BS 4518        |
| France  | French "R" & NF T 47-501 |
| Italy   | 106 to 2687              |
| Italy   | 3021 to 4975             |
| Italy   | 6042 to 82600            |

| Country   | Reference Numbers |
|-----------|-------------------|
| Japan     | JIS 2401 ref. "P" |
| Japan     | JIS 2401 ref. "G" |
| Sweden    | SMS1588           |
| USA       | -001 to -475      |
| Worldwide | ISO/DIN           |

## O-Ring Storage, Handling, and Installation

To achieve the expected lifespan of an O-Ring, proper storage, proper handling and careful installation of O-Rings is necessary to avoid damage to the material and surface, both prior to and during installation - which would adversely affect service life.

The best practical way to store O-Rings is inside a sealed polyurethane bag and then placed in a closed box or container which light cannot penetrate. Options include individually packaging O-Rings in polyethylene-lined craft paper bags - heat sealed to close.

- A. Proper Temperature and Humidity Levels:** O-Rings should be kept cool (below 30°C / 86°F) with an average relative humidity of 40% to 70%. Excessive humidity will deteriorate some seal element material as well as cause corrosive damage to metal cases and spring.
- B. Shield from direct sunlight and ozone:** To slow ozone aging, O-Ring should be kept away from direct or reflected sunlight and electrical equipment that may generate ozone. Excessive heat build-up in the storage area and/or exposure to ozone can cause premature deterioration of the O-Ring, this reducing expected life.
- C. To avoid mechanical damage:** O-Rings should be stored in a place other than a work area to avoid possible mechanical damage by equipment or falling objects. A sealed, closed container should provide protection from mechanical damage, as well as from dirt, dust, grit and other contaminants. When boxes of O-Rings are stacked, take care to avoid damage and crushing to the bottom box of parts due to excessive weight resting on the container.
- D. Avoid radioactive materials:** O-Rings should be protected from radioactive materials and certain fumes which can also cause deterioration of seal element.
- E. First in / first out:** O-Rings should be stored and selected on a "first in, first out" basis, since, even under ideal conditions, an unusually long shelf-life may cause deterioration of element materials.
- F. Rodents and insects:** O-Rings should be protected from rodents and insects, some of which thrive on molded rubber products.
- G. Packaging for shipping:** The O-Rings should be protected from damage and foreign material during shipping from the manufacturer and during final storage. They should not be removed from their packaging until ready for installation; this will ensure protection and clear identification. During unpacking, take care so as not to cut or tear the seal element with sharp instruments, such as knives, screwdrivers, etc.

Special note: Some O-Ring compounds can aggressively attack clear polycarbonate plastic known as Plexiglas. For best results, avoid storing or shipping O-Rings in containers made from this material.