Parker O-Ring Reference Guide

Excerpts from ORD 5700 and ORD 5712

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Table of content

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Basic O-Ring Elastomers

2.0 Elastomers

The basic core polymer of an elastomeric compound is called a rubber, produced either as natural gum rubber in the wild, on commercial rubber plantations or manufactured synthetically by the chemical industry. Today, more than 32 synthetic rubbers are known, the most important ones are listed in Table 2-1.

Modern elastomeric sealing compounds generally contain 50 to 60% base polymer and are often described simply as "rubber." The balance of an elastomer compound consists of various fillers, vulcanizing agents, accelerators, aging retardants and other chemical additives which modify and improve the basic physical properties of the base polymer to meet the particular requirements of a specific application.

Elastomers used in producing seals, and particularly those used in O-rings, will usually provide reliable, leak-free function if fundamental design requirements are observed.

"Cross-linking" between the polymer chains is formed during the vulcanization process, see Figure 2-1. Cross-linking of the molecules changes the rubber from a plastic-like material to an elastic material.

After vulcanization, including any required "post-cure," an elastomer compound attains the physical properties required for a good sealing material. As with all chemical reactions, temperature is responsible for the speed of reaction. Only when the ideal process temperature is constant during the entire vulcanization time, will the optimum degree of curing be reached. For this reason, the conditions of vulcanization are closely controlled and recorded as part of the Parker quality assurance process.

2.1 Introduction to Elastomers

Before reviewing the available elastomers and their general properties, it is necessary to fully understand the terms "polymer," "rubber," "elastomer" and "compound" as they are used in this handbook.

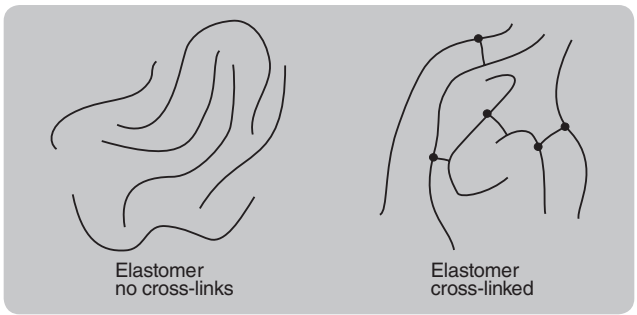

Figure 2-1: Schematic Representation of Polymer Chains Before and After Vulcanization

2.1.1 Polymer

A polymer is the "result of a chemical linking of molecules into a long chain-like structure." Both plastics and elastomers are classified as polymers. In this handbook, polymer generally refers to a basic class of elastomer, members of which have similar chemical and physical properties. O-rings are made from many polymers, but a few polymers account for the majority of O-rings produced, namely Nitrile, EPDM and Neoprene.

Synthetic Rubber		
	Abbreviation	
Chemical Name	DIN/ISO 1629	ASTM D1418
M-Group (saturated carbon molecules in main macro-molecule chain):		
Polyacrylate Rubber	ACM	ACM
Ethylene Acrylate	—	AEM
Chlorosulfonated Polyethylene Rubber	CSM	CSM
Ethylene Propylene Diene Rubber	EPDM	EPDM
Ethylene Propylene Rubber	EPDM	EPM
Fluorocarbon Rubber	FPM	FKM
Tetrafluorethylene Propylene Copolymer	FEPM	FEPM
Perfluorinated Elastomer	—	FFKM
O-Group (with oxygen molecules in the main macro-molecule chain):		
Epichlorohydrin Rubber	CO	CO
Epichlorohydrin Copolymer Rubber	ECO	ECO
R-Group (unsaturated hydrogen carbon chain):		
Butadiene Rubber	BR	BR
Chloroprene Rubber	CR	CR
Isobutene Isoprene Rubber (Butyl Rubber)	IIR	IIR
Chlorobutyl Rubber	CIIR	CIIR
Isoprene Rubber	IR	IR
Nitrile Butadiene Rubber	NBR	NBR
Styrene Butadiene Rubber	SBR	SBR
Hydrogenated Nitrile	—	HNBR
Carboxylated Nitrile	XNBR	XNBR
Q-Group (with Silicone in the main chain):		
Fluorosilicone Rubber	FMQ	FVMQ
Methyl Phenyl Silicone Rubber	PMQ	PMQ
Methyl Phenyl Vinyl Silicone Rubber	PMVQ	PVMQ
Methyl Silicone Rubber	MQ	MQ
Methyl Vinyl Silicone Rubber	VMQ	VMQ
U-Group (with carbon, oxygen and nitrogen in the main chain):		
Polyester Urethane	AU	AU
Polyether Urethane	EU	EU

Table 2-1: The Most Important Types of Synthetic Rubber, Their Groupings and Abbreviations

2.1.2 Rubber

Rubber-like materials first produced from sources other than rubber trees were referred to as "synthetic rubber." This distinguished them from natural gum rubber. Since then, usage in the industry has broadened the meaning of the term "rubber" to include both natural as well as synthetic materials having rubber-like qualities. This handbook uses the broader meaning of the word "rubber."

2.1.3 Elastomer

Though "elastomer" is synonymous with "rubber," it is formally defined as a "high molecular weight polymer that can be, or has been modified, to a state exhibiting little plastic flow and rapid, nearly complete recovery from an extending or compressing force." In most instances we call such material before modification "uncured" or "unprocessed" rubber or polymer.

When the basic high molecular weight polymer, without the addition of plasticizers or other dilutents, is converted by appropriate means to an essentially non-plastic state and tested at room temperature, it usually meets the following requirements in order to be called an elastomer:

A. It must not break when stretched approximately 100%.

B. After being held for five minutes at 100% stretch, it must retract to within 10% of its original length within five minutes of release.

Note: Extremely high hardness/modulus materials generally do not exhibit these properties even though they are still considered elastomers.

The American Society for Testing and Materials (ASTM) uses these criteria to define the term "elastomer."

2.1.4 Compound

A compound is a mixture of base polymer and other chemicals that form a finished rubber material. More precisely, a compound refers to a specific blend of chemical ingredients tailored for particular required characteristics to optimize performance in some specific service.

The basis of compound development is the selection of the polymer type. There may be a dozen or more different ones to choose from. The rubber compounder may then add various reinforcing agents such as carbon black, curing or vulcanizing agents (such as sulfur or peroxide, activators, plasticizers, accelerators, antioxidants, or antiozonants) to the elastomer mixture to tailor it into a seal compound with its own distinct physical properties. Since compounders have thousands of compounding ingredients at their disposal, it seems reasonable to visualize two, three, or even one hundred-plus compounds having the same base elastomer, yet exhibiting marked performance differences in the O-ring seal.

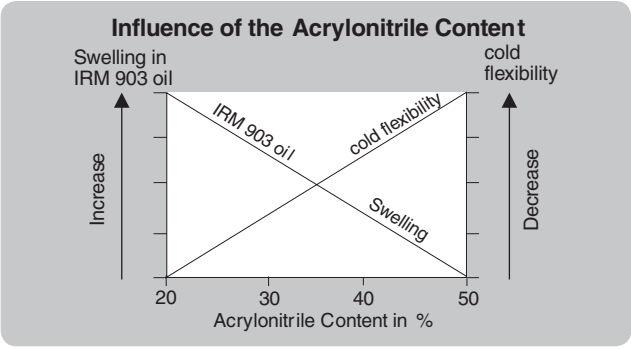

Figure 2-2: Influence of the Acrylonitrile Content

The terms "compound" and "elastomer" are often used interchangeably in a more general sense. This usage usually references a particular type or class of materials such as "nitrile compounds" or "butyl elastomers." Please remember that when one specific compound is under discussion in this handbook, it is a blend of various compounding ingredients (including one or more base elastomers) with its own individual characteristics and identification in the form of a unique compound number, For example, N0674-70 or V1164-75.

2.2 Basic Elastomers for O-Ring Seals

The following paragraphs briefly review the various elastomers currently available for use in O-rings and other elastomeric seals. If any of the rubber terms used in the descriptions are confusing, consult the "Glossary of Seal and Rubber Terms" in the Appendix, Section X. Service recommendations mentioned in this section are necessarily abbreviated. For more comprehensive and specific information on this important subject, see the Fluid Compatibility Tables in Section VII.

2.2.1 Acrylonitrile-Butadiene (NBR)

Nitrile rubber (NBR) is the general term for acrylonitrile butadiene copolymer. The acrylonitrile content of nitrile sealing compounds varies considerably (18% to 50%) and influences the physical properties of the finished material.

The higher the acrylonitrile content, the better the resistance to oil and fuel. At the same time, elasticity and resistance to compression set is adversely affected. In view of these opposing realities, a compromise is often drawn, and a medium acrylonitrile content selected. NBR has good mechanical properties when compared with other elastomers and high wear resistance. NBR is not resistant to weathering and ozone. See Figure 2-2.

Heat resistance

- Up to 100°C (212°F) with shorter life @ 121°C (250°F).

Cold flexibility

- Depending on individual compound, between -34°C and -57°C (-30°F and -70°F).

Chemical resistance

- Aliphatic hydrocarbons (propane, butane, petroleum oil, mineral oil and grease, diesel fuel, fuel oils) vegetable and mineral oils and greases.
- HFA, HFB and HFC hydraulic fluids.
- Dilute acids, alkali and salt solutions at low temperatures.
- Water (special compounds up to 100°C) (212°F).

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Not compatible with:
- Fuels of high aromatic content (for flex fuels a special compound must be used).
- Aromatic hydrocarbons (benzene).
- Chlorinated hydrocarbons (trichloroethylene).
- Polar solvents (ketone, acetone, acetic acid, ethylene-ester).
- Strong acids.
- Brake fluid with glycol base.
- Ozone, weather and atmospheric aging.

2.2.2 Carboxylated Nitrile (XNBR)

Carboxylated Nitrile (XNBR) is a special type of nitrile polymer that exhibits enhanced tear and abrasion resistance. For this reason, XNBR based materials are often specified for dynamic applications such as rod seals and rod wipers.

Heat resistance
- Up to 100°C (212°F) with shorter life @ 121°C (250°F).

Cold flexibility
- Depending on individual compound, between -18°C and -48°C (0°F and -55°F).

Chemical resistance
- Aliphatic hydrocarbons (propane, butane, petroleum oil, mineral oil and grease, diesel fuel, fuel oils) vegetable and mineral oils and greases.
- HFA, HFB and HFC hydraulic fluids.
- Many diluted acids, alkali and salt solutions at low temperatures.

Not compatible with:
- Fuels of high aromatic content (for flex fuels a special compound must be used).
- Aromatic hydrocarbons (benzene).
- Chlorinated hydrocarbons (trichloroethylene).
- Polar solvents (ketone, acetone, acetic acid, ethylene-ester).
- Strong acids.
- Brake fluid with glycol base.
- Ozone, weather and atmospheric aging.

2.2.3 Ethylene Acrylate (AEM, Vamac)

Ethylene acrylate is a terpolymer of ethylene and methyl acrylate with the addition of a small amount of carboxylated curing monomer. Ethylene acrylate rubber is not to be confused with polyacrylate rubber (ACM).

Heat resistance
- Up to 149°C (300°F) with shorter life up to 163°C (325°F).

Cold flexibility
- Between -29°C and -40°C (-20°F and -40°F).

Chemical resistance
- Ozone.
- Oxidizing media.
- Moderate resistance to mineral oils.

Not compatible with:
- Ketones.
- Fuels.
- Brake fluids.

2.2.4 Ethylene Propylene Rubber (EPR, EPDM)

EPR copolymer ethylene propylene and ethylene-propylene-diene rubber (EPDM) terpolymer are particularly useful when sealing phosphate-ester hydraulic fluids and in brake systems that use fluids having a glycol base.

Heat resistance
- Up to 150°C (302°F) (max. 204°C (400°F)) in water and/or steam).

Cold flexibility
- Down to approximately -57°C (-70°F).

Chemical resistance
- Hot water and steam up to 149°C (300°F) with special compounds up to 260°C (500°F).
- Glycol based brake fluids (Dot 3 & 4) and silicone-basaed brake fluids (Dot 5) up to 149°C (300°F).
- Many organic and inorganic acids.
- Cleaning agents, sodium and potassium alkalis.
- Phosphate-ester based hydraulic fluids (HFD-R).
- Silicone oil and grease.
- Many polar solvents (alcohols, ketones, esters).
- Ozone, aging and weather resistant.

Not compatible with:
Mineral oil products (oils, greases and fuels).

2.2.5 Butyl Rubber (IIR)

Butyl (isobutylene, isoprene rubber, IIR) has a very low permeability rate and good electrical properties.

Heat resistance
- Up to approximately 121°C (250°F).

Cold flexibility
- Down to approximately -59°C (-75°F).

Chemical resistance
- Hot water and steam up to 121°C (250°F).
- Brake fluids with glycol base (Dot 3 & 4).
- Many acids (see Fluid Compatibility Tables in Section VII).
- Salt solutions.
- Polar solvents, (e.g. alcohols, ketones and esters).
- Poly-glycol based hydraulic fluids (HFC fluids) and phosphate-ester bases (HFD-R fluids).
- Silicone oil and grease.
- Ozone, aging and weather resistant.

Not compatible with:
- Mineral oil and grease.
- Fuels.
- Chlorinated hydrocarbons.

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2.2.6 Chloroprene Rubber (CR)

Chloroprene was the first synthetic rubber developed commercially and exhibits generally good ozone, aging and chemical resistance. It has good mechanical properties over a wide temperature range.

Heat resistance
- Up to approximately 121°C (250°F).

Cold flexibility
- Down to approximately -40°C (-40°F).

Chemical resistance
- Paraffin based mineral oil with low DPI, e.g. ASTM oil No. 1.
- Silicone oil and grease.
- Water and water solvents at low temperatures.
- Refrigerants
- Ammonia
- Carbon dioxide
- Improved ozone, weathering and aging resistance compared with nitrile.

Limited compatibility
- Naphthalene based mineral oil (IRM 902 and IRM 903 oils).
- Low molecular weight aliphatic hydrocarbons (propane, butane, fuel).
- Glycol based brake fluids.

Not compatible with:
- Aromatic hydrocarbons (benzene).
- Chlorinated hydrocarbons (trichloroethylene).
- Polar solvents (ketones, esters, ethers).

2.2.7 Fluorocarbon (FKM)

Fluorocarbon (FKM) has excellent resistance to high temperatures, ozone, oxygen, mineral oil, synthetic hydraulic fluids, fuels, aromatics and many organic solvents and chemicals. Low temperature resistance is normally not favorable and for static applications is limited to approximately -26°C (-15°F) although certain compounds are suitable down to -46°C (-50°F). Under dynamic conditions, the lowest service temperature is between -15°C and -18°C (5°F and 0°F).

Gas permeability is very low and similar to that of butyl rubber. Special FKM compounds exhibit an improved resistance to acids and fuels.

Heat resistance
- Up to 204°C (400°F) and higher temperatures with shorter life expectancy.

Cold flexibility
- Down to -26°C (-15°F) (some to -46°C) (-50°F).

Chemical resistance
- Mineral oil and grease, ASTM oil No. 1, and IRM 902 and IRM 903 oils.
- Non-flammable hydraulic fluids (HFD).
- Silicone oil and grease.
- Mineral and vegetable oil and grease.
- Aliphatic hydrocarbons (butane, propane, natural gas).
- Aromatic hydrocarbons (benzene, toluene).
- Chlorinated hydrocarbons (trichloroethylene and carbon tetrachloride).
- Gasoline (including high alcohol content).
- High vacuum.
- Very good ozone, weather and aging resistance.

Not compatible with:
- Glycol based brake fluids.
- Ammonia gas, amines, alkalis.
- Superheated steam.
- Low molecular weight organic acids (formic and acetic acids).

2.2.8 Fluorosilicone (FVMQ)

FVMQ contains trifluoropropyl groups next to the methyl groups. The mechanical and physical properties are very similar to VMQ. However, FVMQ offers improved fuel and mineral oil resistance but poor hot air resistance when compared with VMQ.

Heat resistance
- Up to 177°C (350°F) max.

Cold flexibility
- Down to approximately -73°C (-100°F).

Chemical resistance
- Aromatic mineral oils (IRM 903 oil).
- Fuels.
- Low molecular weight aromatic hydrocarbons (benzene, toluene).

2.2.9 Hydrogenated Nitrile (HNBR, HSN)

Hydrogenated nitrile is a synthetic polymer that results from the hydrogenation of nitrile rubber (NBR). Superior mechanical characteristics, particularly high strength, helps reduce extrusion and wear.

Heat resistance
- Up to 150°C (300°F)

Cold flexibility
- Down to approximately -48°C (-55°F)

Chemical resistance
- Aliphatic hydrocarbons.
- Vegetable and animal fats and oils.
- HFA, HFB and HFC hydraulic fluids.
- Dilute acids, bases and salt solutions at moderate temperatures.
- Water and steam up to 149°C (300°F).
- Ozone, aging and weathering.

Not compatible with:
- Chlorinated hydrocarbons.
- Polar solvents (ketones, esters and ethers).
- Strong acids.

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2.2.10 Perfluoroelastomer (FFKM)

Perfluoroelastomer (FFKM) currently offers the highest operating temperature range, the most comprehensive chemical compatibility, and the lowest off-gassing and extractable levels of any rubber material. Parker's proprietary formulations deliver an extreme performance spectrum that make them ideal for use in critical applications like semiconductor chip manufacturing, jet engines and chemical processing equipment.

Heat resistance
- Up to 320°C (608°F).

Cold flexibility
- -18°C to -26°C (0°F to -15°F).

Chemical resistance
- Aliphatic and aromatic hydrocarbons.
- Chlorinated hydrocarbons.
- Polar solvents (ketones, esters, ethers).
- Inorganic and organic acids.
- Water and steam.
- High vacuum with minimal loss in weight.

Not compatible with:
- Fluorinated refrigerants (R11, 12, 13, 113, 114, etc.)
- Perfluorinated lubricants (PFPE)

2.2.11 Polyacrylate (ACM)

ACM (acrylic rubber) has good resistance to mineral oil, oxygen and ozone. Water compatibility and cold flexibility of ACM are significantly worse than with nitrile.

Heat resistance
- Up to approximately 177°C (350°F).

Cold flexibility
- Down to approximately -21°C (-5°F).

Chemical resistance
- Mineral oil (engine, gear box, ATF oil).
- Ozone, weather and aging.

Not compatible with:
- Glycol based brake fluid (Dot 3 and 4).
- Aromatics and chlorinated hydrocarbons.
- Hot water, steam.
- Acids, alkalis, amines.

2.2.12 Polyurethane (AU, EU)

Polyurethane elastomers, as a class, have excellent wear resistance, high tensile strength and high elasticity in comparison with any other elastomers. Permeability is good and comparable with butyl.

Heat resistance
- Up to approximately 82°C (180°F).

Cold flexibility
- Down to approximately -40°C (-40°F).

Chemical resistance
- Pure aliphatic hydrocarbons (propane, butane).
- Mineral oil and grease.
- Silicone oil and grease.
- Water up to 50°C (125°F).

Not compatible with:
- Ketones, esters, ethers, alcohols, glycols.
- Hot water, steam, alkalis, amines, acids.

2.2.13 Silicone Rubber (Q, MQ, VMQ, PVMQ)

Silicones have good ozone and weather resistance as well as good insulating and physiologically neutral properties. However, silicone elastomers as a group, have relatively low tensile strength, poor tear strength and little wear resistance.

Heat resistance
- Up to approximately 204°C (400°F) special compounds up to 260°C (500°F).

Cold flexibility
- Down to approximately -54°C (-65°F) special compounds down to -115°C (-175°F).

Chemical resistance
- Animal and vegetable oil and grease.
- High molecular weight chlorinated aromatic hydrocarbons (including flame-resistant insulators, and coolant for transformers).
- Moderate water resistance.
- Diluted salt solutions.
- Ozone, aging and weather.

Not compatible with:
- Superheated water steam over 121°C (250°F).
- Acids and alkalis.
- Low molecular weight chlorinated hydrocarbons (trichloroethylene).
- Hydrocarbon based fuels.
- Aromatic hydrocarbons (benzene, toluene).
- Low molecular weight silicone oils.

2.2.14 Tetrafluoroethylene-Propylene (AFLAS)

This elastomer is a copolymer of tetrafluoroethylene (TFE) and propylene. Its chemical resistance is excellent across a wide range of aggressive media.

Heat resistance
- Up to approximately 232°C (450°F).

Cold flexibility
- Down to approximately -9°C (15°F).

Compatible with
- Bases.
- Phosphate Esters.
- Amines.
- Engine Oils.
- Steam and hot water.
- Pulp and paper liquors.

Not compatible with:
- Aromatic Fuels.
- Ketones.
- Chlorinated hydrocarbons.

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2.3 Compound Selection and Numbering Systems

The base elastomer and the hardness of the *finished* product are the main factors which enable a given compound to resist heat, chemical and other physical influences.

The Parker compound code contains all the essential information needed to identify the polymer family as well as the special property description and hardness.

In the Type I numbering system, the base polymer of the compound is identified by the prefix letter:

A = Polyacrylate
B = Butyl or chlorobutyl
C = Neoprene
E = Ethylene-propylene or ethylene propylene diene
F = Parofluor Ultra
H = Hifluor
K = Hydrogenated nitrile
L = Fluorosilicone
N = Acrylonitrile butadiene (nitrile), hydrogenated nitrile and carboxylated nitrile
P = Polyurethane
S = Silicone
V = Fluorocarbon, AFLAS, Parofluor and Hifluor
Z = Exotic or specialty blends

In the Type II numbering system, the special property description is identified by a second letter:

A = General purpose
B = Low compression set
E = Ethylene acrylate
F = Fuel resistant or fully fluorinated
G = High fluorine content
J = NSF/FDA/WRAS approvals
L = Internally lubed
M = MIL/AMS approvals
P = Low temperature or AFLAS
W = Non-black compound
S = Carboxylated

The shore hardness range of a compound is indicated by the suffix numbers, e.g. "70" means that the material's hardness is 70±5 Shore A.

The individual sequential compound number is shown between the suffix and the prefix.

Type I Example: N0674-70 where

N = Acrylonitrile-butadiene or simply nitrile
0674 = Individual sequential compound identifier
-70 = Nominal Shore A hardness

Type II Example: NA151-70 where

N = Acrylonitrile-butadiene or simply nitrile
A = General purpose
151 = Individual sequential compound identifier
-70 = Nominal Shore A hardness

2.3.1 Selection of Base Polymer

System operating temperatures and compatibility with the media to be sealed are the two most important parameters which must be considered when selecting a base polymer. Only when these two factors are identified (including any lubricants and potential cleaning fluids), can a reliable recommendation be given concerning selection of the proper elastomer base. For the seal designed, a compromise often has to be made between specifying high quality, sealing grade materials and cheaper commercial products (which usually contain less base polymer and more inexpensive fillers).

The application temperatures given in Figure 2-3 refer to long-term exposure to non-aggressive media. At higher temperatures, new crosslink sites may be formed between the polymer chains and lead to a loss of seal flexibility. The stiffness in the polymer chains may be observed as excessive compression set in highly filled (loaded) compounds. This condition prevents an O-ring cross-section from returning to its original, pre-compressed shape after deformation forces are removed. During compression, a seal changes its original shape to effect a seal and over time, and with excessive temperature, elastic memory loss in the elastomer seal element can cause leakage. Exceeding the normal maximum temperature limit for a given compound always results in reduced service life.

Practically all elastomers undergo a physical or chemical change when in contact with a sealed medium. The degree of change depends on the chemistry of the medium and on the system temperature. An aggressive medium becomes more active with increasing temperature. Physical changes are caused by three mechanisms which can work concurrently when:

a. The elastomer absorbs a medium.
b. Plasticizers and other components of the compound are dissolved and extracted or leached out by the media.
c. Chemical reactions between the elastomer and the sealed medium.

The result is often volume change, i.e. swelling or shrinkage of the elastomer seal. The degree of volume change depends on the type of medium, molecular structure of the rubber compound, system temperature, geometrical seal shape (material thickness), and the stressed condition of the rubber part (compression or stretch). When deformed and exposed to a medium, rubber, when confined in a gland, swells significantly less than in free state (up to 50%) due to a number of factors including lessened surface area in contact with the medium.

The limit of permissible volume change varies with the application. For static seals, a volume change of 25% to 30% can be tolerated. Swelling leads to some deterioration of the mechanical properties, and in particular, those properties which improve extrusion resistance.

In dynamic applications, swelling leads to increased friction and a higher wear rate. Therefore, a maximum swell of 10% should generally not be exceeded. Shrinkage should also be avoided because the resulting loss of compressive force will increase the risk of leakage.

The extraction of plasticizer from a seal material is sometimes compensated for by partial absorption of the contact medium.

This situation however, can still lead to unexpected shrinkage and resultant leakage when an elastomer dries out and the absorbed fluids evaporate.

A chemical reaction between sealed or excluded medium and the elastomer can bring about structural changes in the form of further crosslinking or degrading. The smallest chemical change in an elastomer can lead to significant changes in physical properties, such as embrittlement.

The suitability of an elastomer for a specific application can be established only when the properties of both the medium and the elastomer are known under typical **working** conditions. If a particular seal material suits a medium, it is referred to as being "compatible" with that medium. See Table 2-2 for a comparison of the properties of commonly used elastomers.

2.4 Physical and Chemical Characteristics

In addition to the basic elastomer descriptions, it is helpful have more information on the important physical and chemical properties of various elastomer compounds. This information is needed to provide a clearer picture of how physical and chemical properties interact and affect the proper selection of an effective seal material. Among the more basic physical properties that have to be considered are:

2.4.1 Resistance to Fluid

As used throughout this handbook, the term "fluid" denotes the substance retained by the seal. It may be a solid, a liquid, a gas, a vapor or a mixture of all. (The term "medium" — plural "media" — is often used with this same meaning intended.)

The chemical effect of the fluid on the seal is of prime importance. The fluid must not alter the operational characteristics or reduce the life expectancy of the seal significantly. Excessive chemical deterioration of the seal must be avoided. It is easy, however, to be misled on this point. A significant amount of volume shrinkage usually results in premature leakage of any O-ring seal, whether static or dynamic. On the other hand, a compound that swells excessively in a fluid, or develops

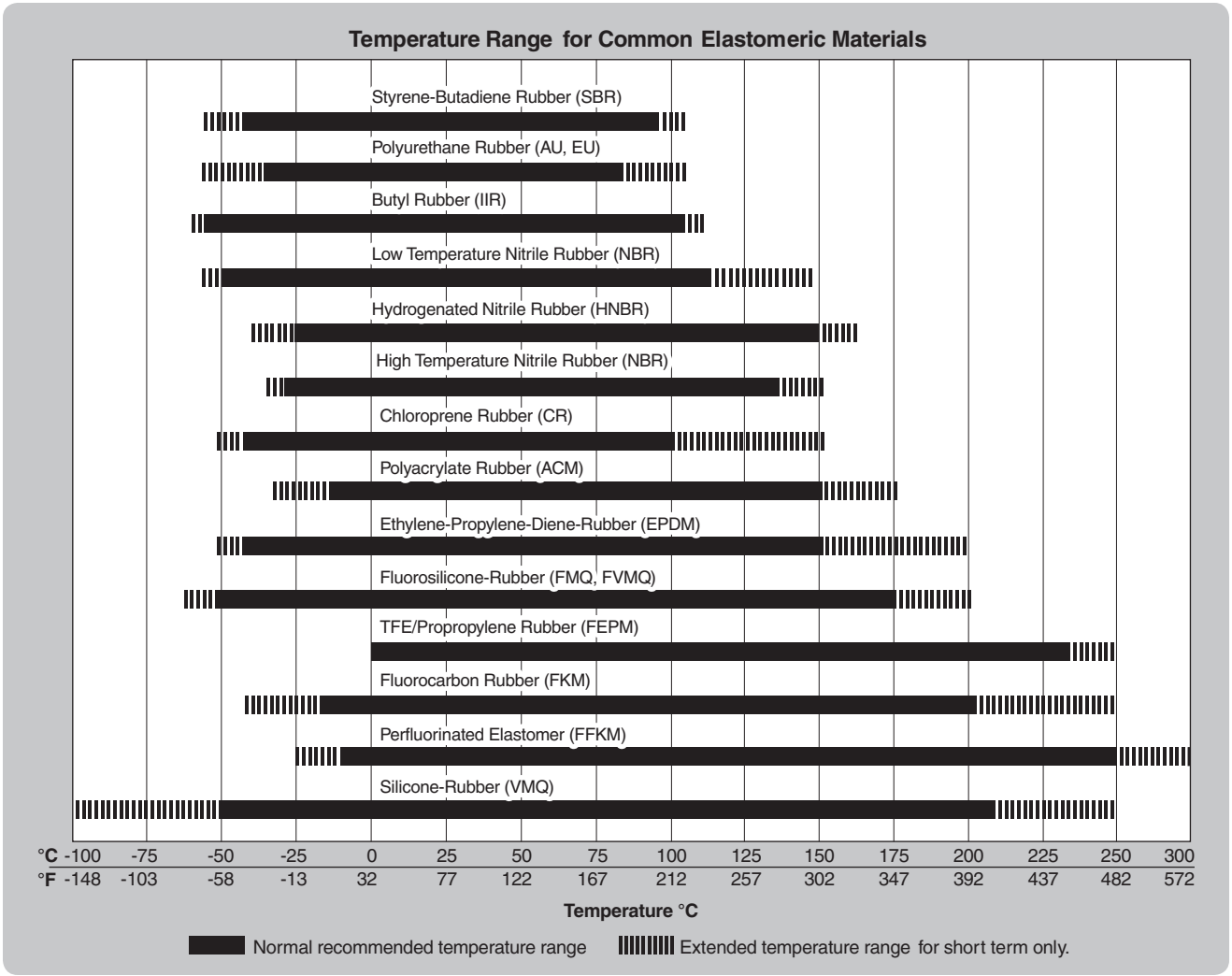

Figure 2-3: Temperature Range for Common Elastomeric Materials

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a large increase or decrease in hardness, tensile strength, or elongation, will often continue to serve well for a long time as a static seal in spite of such undesirable conditions.

2.4.2 Hardness

Throughout the seal industry, the Shore A type durometer scale, manufactured by a variety of manufacturers, is the standard instrument used to measure the hardness of most rubber compounds. It should be noted that there are other hardness scales used to describe elastomers (B, C, D, DO, O, OO) but these are typically not used by the rubber seal industry.

The durometer has a calibrated spring which forces an indentor point into the test specimen against the resistance of the rubber. The indicating scale reads the hardness of the rubber. If there is no penetration, the scale will read 100, as on a flat glass or steel surface. (For specimens that are too thin or provide too small an area for accurate durometer readings, Micro Hardness Testing is recommended).

In the O-ring industry, another hardness scale is used due to the curved surface of the O-ring cross-section causing problems with accurately reading Shore A. The scale is IRHD (International Rubber Hardness Degrees). The size and shape of the indentor used in IRHD readings is much smaller, thus allowing for more accurate measurements on curved surfaces such as an O-ring cross-section. Unfortunately, there is not a direct correlation between the readings of Shore A and IRHD Scales.

Comparison of Properties of Commonly Used Elastomers
(P = Poor – F = Fair – G = Good – E = Excellent)

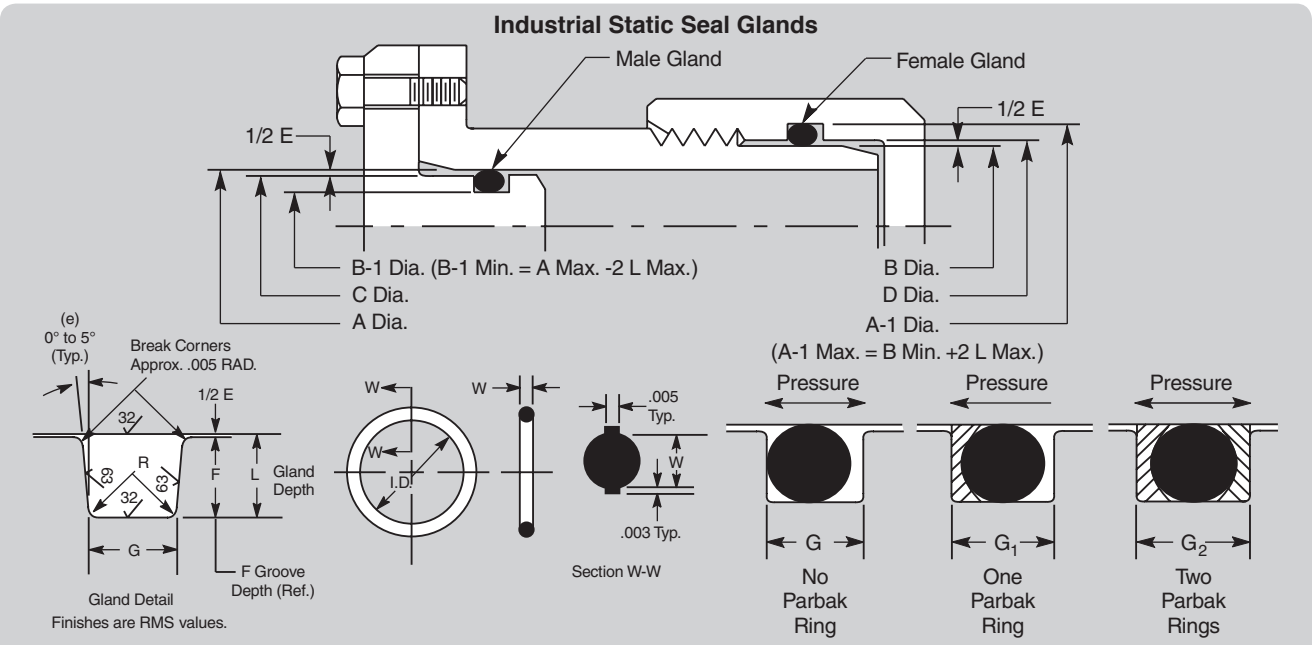
Elastomer Type (Polymer)	Parker Compound Prefix Letter	Abrasion Resistance	Acid Resistance	Chemical Resistance	Cold Resistance	Dynamic Properties	Electrical Properties	Flame Resistance	Heat Resistance	Impermeability	Oil Resistance	Ozone Resistance	Set Resistance	Tear Resistance	Tensile Strength	Water/Steam Resistance	Weather Resistance
AFLAS (TFE/Prop)	V	GE	E	E	P	G	E	E	E	G	E	E	PF	PF	FG	GE	E
Butadiene		E	FG	FG	G	F	G	P	F	F	P	P	G	GE	E	FG	F
Butyl	B	FG	G	E	G	F	G	P	G	E	P	GE	FG	G	G	G	GE
Chlorinated Polyethylene		G	F	FG	PF	G	G	GE	G	G	FG	E	F	FG	G	F	E
Chlorosulfonated Polyethylene		G	G	E	FG	F	F	G	G	G	F	E	F	G	F	F	E
Epichlorohydrin	Y	G	FG	G	GE	G	F	FG	FG	GE	E	E	PF	G	G	F	E
Ethylene Acrylic	A	F	F	FG	G	F	F	P	E	E	F	E	G	F	G	PF	E
Ethylene Propylene	E	GE	G	E	GE	GE	G	P	G	G	P	E	GE	GE	GE	E	E
Fluorocarbon	V	G	E	E	PF	GE	F	E	E	G	E	E	E	F	GE	F	E
Fluorosilicone	L	P	FG	E	GE	P	E	G	E	P	G	E	G	P	F	F	E
Isoprene		E	FG	FG	G	F	G	P	F	F	P	P	G	GE	E	FG	F
Natural Rubber		E	FG	FG	G	E	G	P	F	F	P	P	G	GE	E	FG	F
Neoprene	C	G	FG	FG	FG	F	F	G	G	G	FG	GE	F	FG	G	F	E
HNBR	N, K	G	E	FG	G	GE	F	P	E	G	E	G	GE	FG	E	E	G
Nitrile or Buna N	N	G	F	FG	G	GE	F	P	G	G	E	P	GE	FG	GE	FG	F
Perfluorinated Fluoroelastomer	V, F	P	E	E	PF	F	E	E	E	G	E	E	G	PF	FG	GE	E
Polyacrylate	A	G	P	P	P	F	F	P	E	E	E	E	F	FG	F	P	E
Polysulfide		P	P	G	G	F	F	P	P	E	E	E	P	P	F	F	E
Polyurethane	P	E	P	FG	G	E	FG	P	F	G	G	E	F	GE	E	P	E
SBR or Buna S		G	F	FG	G	G	G	P	FG	F	P	P	G	FG	GE	FG	F
Silicone	S	P	FG	GE	E	P	E	F	E	P	FG	E	GE	P	P	F	E

Table 2-2: Comparison of Properties of Commonly Used Elastomers

Guide for Design Table 4-2

If Desired Dimension is Known for	Select Closest Dimension in Column	Read Horizontally in Column	To Determine Dimension for
Bore Dia. male gland	A	B-1 C G	Groove Dia. (male gland) Plug Dia. (male gland) Groove width
Plug Dia. male gland	C	A B-1 G	Bore Dia. (male gland) Groove (male gland) Groove width
Tube OD female gland	B	A-1 D G	Groove Dia. (female gland) Throat Dia. (female gland) Groove width
Throat Dia. female gland	D	A-1 B G	Groove Dia. (female gland) Tube OD (female gland) Groove width

Design Guide 4-2: Guide for Design Table 4-2



Refer to Design Chart 4-2 (below) and Design Table 4-2 for dimensions metric conversion 32√ = .8√

Industrial O-Ring Static Seal Glands

O-Ring 2-Size AS568B-	W Cross-Section Nominal	W Cross-Section Actual	L Gland Depth	Squeeze Actual	Squeeze %	E(a) Diametral Clearance	G - Groove Width: No Parbak Ring (G)	G - Groove Width: One Parbak Ring (G_1)	G - Groove Width: Two Parbak Ring (G_2)	R Groove Radius	Max. Eccentricity (b)
004 through 050	1/16	.070 ±.003 (1.78 mm)	.050 to .052	.015 to .023	22 to 32	.002 to .005	.093 to .098	.138 to .143	.205 to .210	.005 to .015	.002
102 through 178	3/32	.103 ±.003 (2.62 mm)	.081 to .083	.017 to .025	17 to 24	.002 to .005	.140 to .145	.171 to .176	.238 to .243	.005 to .015	.002
201 through 284	1/8	.139 ±.004 (3.53 mm)	.111 to .113	.022 to .032	16 to 23	.003 to .006	.187 to .192	.208 to .213	.275 to .280	.010 to .025	.003
309 through 395	3/16	.210 ±.005 (5.33 mm)	.170 to .173	.032 to .045	15 to 21	.003 to .006	.281 to .286	.311 to .316	.410 to .415	.020 to .035	.004
425 through 475	1/4	.275 ±.006 (6.99 mm)	.226 to .229	.040 to .055	15 to 20	.004 to .007	.375 to .380	.408 to .413	.538 to .543	.020 to .035	.005

(a) Clearance (extrusion gap) must be held to a minimum consistent with design requirements for temperature range variation.
(b) Total indicator reading between groove and adjacent bearing surface.
(c) Reduce maximum diametral clearance 50% when using silicone or fluorosilicone O-rings.
(d) For ease of assembly, when Parbaks are used, gland depth may be increased up to 5%.

Design Chart 4-2: For Industrial O-Ring Static Seal Glands

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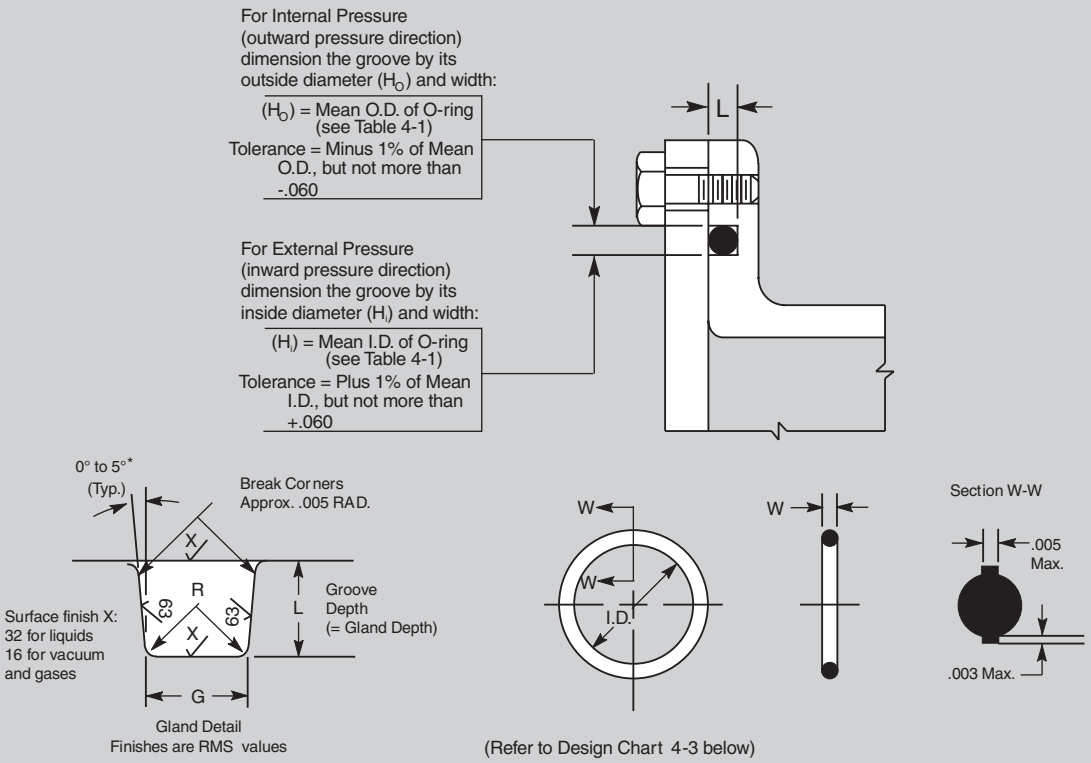

O-Ring Face Seal Glands These dimensions are intended primarily for face type O-ring seals and low temperature applications.

O-Ring Size Parker No. 2	W Cross Section Nominal	W Cross Section Actual	L Gland Depth	Squeeze Actual	Squeeze %	G Groove Width Liquids	G Groove Width Vacuum and Gases	R Groove Radius
004 through 050	1/16	.070 ±.003 (1.78 mm)	.050 to .054	.013 to .023	19 to 32	.101 to .107	.084 to .089	.005 to .015
102 through 178	3/32	.103 ±.003 (2.62 mm)	.074 to .080	.020 to .032	20 to 30	.136 to .142	.120 to .125	.005 to .015
201 through 284	1/8	.139 ±.004 (3.53 mm	.101 to .107	.028 to .042	20 to 30	.177 to .187	.158 to .164	.010 to .025
309 through 395	3/16	.210 ±.005 (5.33 mm)	.152 to .162	.043 to .063	21 to 30	.270 to .290	.239 to .244	.020 to .035
425 through 475	1/4	.275 ±.006 (6.99 mm)	.201 to .211	.058 to .080	21 to 29	.342 to .362	.309 to .314	.020 to .035
Special	3/8	.375 ±.007 (9.52 mm)	.276 to .286	.082 to .106	22 to 28	.475 to .485	.419 to .424	.030 to .045
Special	1/2	.500 ±.008 (12.7 mm)	.370 to .380	.112 to .138	22 to 27	.638 to .645	.560 to .565	.030 to .045

Design Chart 4-3: Design Chart for O-Ring Face Seal Glands

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5.31.2 O-Ring Glands for Industrial Reciprocating Seals

Design Chart 5-2 provides a reasonable basis for calculating reciprocating O-ring seal glands. Design Table 5-2, which follows it, contains recommended gland dimensions for the standard AS568A O-ring sizes. The major difference from the military gland dimensions (Design Table 5-1) is the use of standard cylinder bore and standard rod dimensions.

Although these dimensions are suitable for most reciprocating designs, it is often desirable, or even necessary, to deviate from them. Other portions of this handbook on Basic O-Ring Elastomers (Section II) and O-Ring Applications (Section III) are helpful in determining when such special designs are indicated and provide useful data for such modified designs.

Procedures for using Design Table 5-2 are outlined in Design Guide 5-2. See Section X, Table 10-6 for installation guidelines.

Gland Dimensions for Industrial Reciprocating O-Ring Seals
Groove Diameter (Rod Gland) Tolerance
- .000 for all sizes
+ .002 for sizes 2-006 through 2-324
+ .004 for sizes 2-325 through 2-460
Groove Diameter (Piston) Tolerance
+ .000 for all sizes
- .002 for sizes 2-006 through 2-324
- .004 for sizes 2-325 through 2-460

Design Guide 5-2a: Gland Dimensions for Industrial Reciprocating O-Ring Seals

Guide for Design Table 5-2

If Desired Dimension is Known for	Select Closest Dimension in Column	Read Horizontally in Column	To Determine Dimension for
Bore Dia of cylinder	A	B-1	Groove Dia of piston
		C	OD of piston
		G	Groove width
OD of piston	C	A	Bore Dia of cylinder
		B-1	Groove Dia of piston
		G	Groove width
OD of rod	B	A-1	Groove Dia for rod
		D	Bore ID for rod
		G	Groove width
Bore Dia for rod	D	A-1	Groove Dia for rod
		B	OD of rod
		G	Groove width

Design Guide 5-2b: Guide For Design Table 5-2

After selecting gland dimensions, read horizontally to determine proper O-ring size number. Specify compound.

Industrial Reciprocating O-Ring Packing Glands

O-Ring 2-Size AS568A-	W Cross-Section Nominal	W Cross-Section Actual	L Gland Depth	Squeeze Actual	Squeeze %	E(a) Diametral Clearance	G-GrooveWidth No Parbak Ring(G)	G-GrooveWidth One Parbak Ring(G_1)	G-GrooveWidth Two Parbak Rings(G_2)	R Groove Radius	Max. Eccentricity (b)
006		.070	.055	.010	15	.002	.093	.138	.205	.005	
through	1/16	± .003	to	to	to	to	to	to	to	to	.002
012			.057	.018	25	.005	.098	.143	.210	.015	
104		.103	.088	.010	10	.002	.140	.171	.238	.005	
through	3/32	± .003	to	to	to	to	to	to	to	to	.002
116			.090	.018	17	.005	.145	.176	.243	.015	
201		.139	.121	.012	9	.003	.187	.208	.275	.010	
through	1/8	± .004	to	to	to	to	to	to	to	to	.003
222			.123	.022	16	.006	.192	.213	.280	.025	
309		.210	.185	.017	8	.003	.281	.311	.410	.020	
through	3/16	± .005	to	to	to	to	to	to	to	to	.004
349			.188	.030	14	.006	.286	.316	.415	.035	
425		.275	.237	.029	11	.004	.375	.408	.538	.020	
through	1/4	± .006	to	to	to	to	to	to	to	to	.005
460			.240	.044	16	.007	.380	.413	.543	.035	

(a) Clearance (extrusion gap) must be held to a minimum consistent with design requirements for temperature range variation.
(b) Total indicator reading between groove and adjacent bearing surface.

Design Chart 5-2-a: Design Chart for Industrial Reciprocating O-Ring Packing Glands

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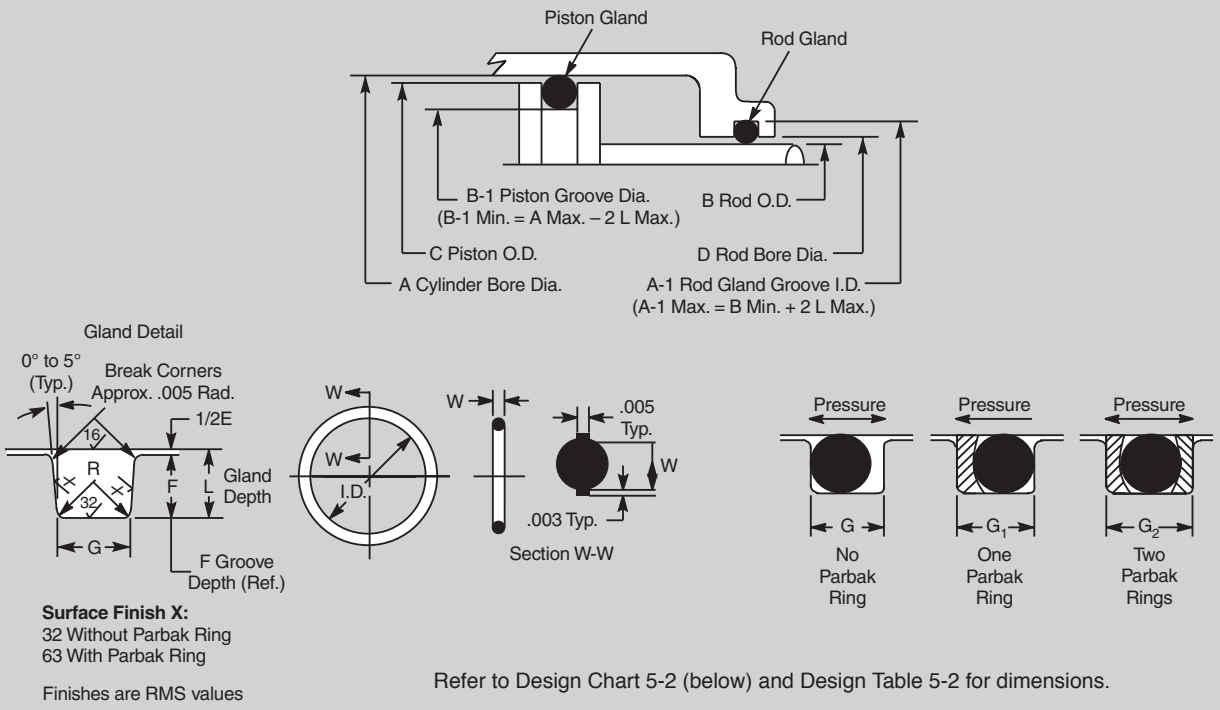
Industrial Reciprocating O-Ring Packing Glands



Surface Finish X:
32 Without Parbak Ring
63 With Parbak Ring

Finishes are RMS values

Refer to Design Chart 5-2 (below) and Design Table 5-2 for dimensions.

Industrial Dynamic Metric Cross-Sections

Industrial Dynamic Metric Cross-Sections

W Cross-Section	L Gland Depth	G-Grove Width No Parbak Ring (G)	R Groove Radius
1.50	1.30	1.90	0.20 to 0.40
1.80	1.45	2.40	0.20 to 0.40
2.00	1.70	2.60	0.20 to 0.40
2.50	2.10	3.30	0.20 to 0.40
2.65	2.20	3.60	0.20 to 0.40
3.00	2.60	3.90	0.40 to 0.80
3.55	3.05	4.80	0.40 to 0.80
4.00	3.50	5.30	0.40 to 0.80
5.00	4.45	6.70	0.40 to 0.80
5.30	4.65	7.10	0.40 to 0.80
6.00	5.40	8.00	0.40 to 0.80
7.00	6.20	9.50	0.40 to 0.80

(a) Dimensions are in mm. The ISO/DIN recommendations are preferred.
(b) Parbaks are not available in standard for metric sizes.

Design Chart 5-2-b: Design Chart for Industrial Dynamic Metric Cross-Sections

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Compatibility Tables for Gases, Fluids, Solids

COMPOUND COMPATIBILITY RATING
1 - Satisfactory
2 - Fair (usually OK for static seal)
3 - Doubtful (sometimes OK for static seal)
4 - Unsatisfactory
x - Insufficient Data

	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
— A —																			
A-A-52624	E1267-80	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
A-A-59290	E1267-80	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Abietic Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Acetaldehyde	E0540-80	3	3	2	4	1	1	3	3	3	4	4	2	2	2	2	3	4	2
Acetamide	C0873-70	1	1	1	3	1	1	2	1	4	4	4	2	4	4	4	2	1	2
Acetanilide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Acetic Acid, 30%	E0540-80	X	X	1	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Acetic Acid, 5%	E0540-80	2	2	1	1	1	1	1	1	2	4	4	1	2	2	2	1	2	1
Acetic Acid, Glacial	E0540-80	2	2	1	2	1	1	3	4	2	4	4	2	2	2	2	3	2	1
Acetic Acid, Hot, High Pressure	FF200-75	4	4	3	4	2	1	3	4	4	4	4	4	4	4	4	3	4	3
Acetic Anhydride	C0873-70	3	4	2	4	1	1	2	2	2	4	4	2	2	2	2	2	4	2
Acetoacetic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Acetone	E0540-80	4	4	1	4	2	1	2	4	4	4	4	1	4	4	4	3	4	4
Acetone Cyanohydrin	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Acetonitrile (Methyl Cyanide)	E0540-80	3	3	1	3	1	1	1	X	X	X	X	X	X	X	X	X	X	X
Acetophenetidine	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Acetophenone	E0540-80	4	4	1	4	2	1	2	4	4	4	4	2	4	4	4	4	4	4
Acetotoluidide	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Acetyl Acetone	E0540-80	4	4	1	4	2	1	2	4	4	4	4	1	4	4	4	4	4	4
Acetyl Bromide	V1164-75	4	4	1	1	1	1	2	4	4	4	4	1	4	4	4	4	4	4
Acetyl Chloride	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	1	4
Acetylene	E0540-80	1	1	1	1	1	1	1	2	2	4	4	1	2	2	2	2	X	2
Acetylene Tetrabromide	V1164-75	4	4	1	1	1	1	1	2	4	X	4	1	X	X	X	X	X	X
Acetylene Tetrachloride	V1164-75	4	4	1	1	1	1	1	2	4	X	4	1	X	X	X	X	X	X
Acetylsalicylic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Acids, Non-organic	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Acids, Organic	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Aconitic Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Acridine	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Acrolein	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Acrylic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Acrylonitrile	FF500-75	4	4	4	3	1	1	3	4	3	4	4	4	X	3	3	3	4	4
Adipic Acid	E0540-80	1	1	2	X	1	1	2	X	X	X	X	X	X	X	X	X	X	X
Aero Lubriplate	N0674-70	1	1	4	1	1	1	2	1	2	1	1	4	4	4	4	1	1	2
Aero Shell 17 Grease	N0674-70	1	1	4	1	1	1	2	2	4	1	1	4	4	4	4	1	1	2

Approximate Service Temperature Ranges for Commonly Used Basic Polymer Types*

Nitrile (General Service)	-34°C to 121°C (-30°F to 250°F)*	AFLAS	-9°C to 232°C (15°F to 450°F)*
Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
Hydrogenated Nitrile	-32°C to 149°C (-23°F to 300°F)*	Polyacrylate	-21°C to 177°C (- 5°F to 350°F)*
Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

NOTE: *These temperature ranges will apply to the majority of media for which the material is potentially recommended. With some media however, the service temperature range may be significantly different. ALWAYS TEST UNDER ACTUAL SERVICE CONDITIONS.

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COMPOUND COMPATIBILITY RATING
1 - Satisfactory
2 - Fair (usually OK for static seal)
3 - Doubtful (sometimes OK for static seal)
4 - Unsatisfactory
x - Insufficient Data

	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Aero Shell 560	VM835-70	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Aero Shell 750	V1164-75	2	2	4	1	1	1	2	4	4	2	4	4	4	4	4	4	2	4
Aero Shell 7A Grease (MIL-G-23827)	N0674-70	2	2	4	1	1	1	2	2	4	1	1	4	4	4	4	1	1	2
Aero Shell IAC	N0674-70	1	1	4	1	1	1	2	2	4	1	1	4	4	4	4	1	1	2
Aerosafe 2300	E0540-80	4	4	1	4	1	1	2	4	4	4	4	2	4	4	4	4	3	3
Aerosafe 2300W	E0540-80	4	4	1	4	1	1	2	4	4	4	4	2	4	4	4	4	3	3
Aerozene 50 (50% Hydrazine 50% UDMH)	E0540-80	3	3	1	4	3	2	2	4	4	X	4	1	4	4	4	4	4	4
Air, Below 200° F	E0540-80	2	2	1	1	1	1	1	1	2	1	2	1	2	2	2	1	1	1
Air, 200 - 300° F	S0604-70	3	3	2	1	1	1	1	2	4	2	3	2	4	4	4	2	1	1
Air, 300 - 400° F	S0604-70	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	1
Air, 400 - 500° F	S0455-70	4	4	4	3	2	2	3	4	4	4	4	4	4	4	4	4	4	2
Aliphatic Dicarboxylic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Alkanes (Paraffin Hydrocarbons)	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Alkanesulfonic Acid	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Alkazene	V1164-75	4	4	4	2	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Alkenes (Olefin Hydrocarbons)	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Alkyl Acetone	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Alkyl Alcohol	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Alkyl Amine	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Alkyl Aryl Sulfonates	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Alkyl Aryl Sulfonics	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Alkyl Benzene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Alkyl Chloride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Alkyl Lithium	FF500-75	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Alkyl Sulfide*	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Alkylnaphthalene Sulfonic Acid	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Allyl Chloride	V1164-75	2	2	4	1	1	1	X	1	X	X	X	X	X	X	X	X	X	X
Allylidene Diacetate	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Alpha Picoline	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Aluminum Acetate	E0540-80	2	2	1	4	1	1	2	2	2	4	4	1	4	1	1	4	4	4
Aluminum Bromide	N0674-70	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1
Aluminum Chlorate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Aluminum Chloride	N0674-70	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	2
Aluminum Ethylate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Aluminum Fluoride	N0674-70	1	1	1	1	1	1	1	1	1	X	3	1	1	1	2	1	1	2
Aluminum Fluorosilicate*	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Aluminum Formate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Aluminum Hydroxide	E0540-80	2	X	1	2	1	1	1	X	X	X	X	X	X	X	X	X	X	2
Aluminum Linoleate	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Aluminum Nitrate	N0674-70	1	1	1	1	1	1	1	1	1	X	3	1	1	1	1	1	X	2

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Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
Hydrogenated Nitrile	-32°C to 149°C (-23°F to 300°F)*	Polyacrylate	-21°C to 177°C (- 5°F to 350°F)*
Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Aluminum Oxalate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Aluminum Phosphate	E0540-80	1	1	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	2
Aluminum Potassium Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Aluminum Salts	N0674-70	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1
Aluminum Sodium Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Aluminum Sulfate	N0674-70	1	1	1	1	1	1	1	1	2	4	4	1	1	1	1	1	1	1
Alums-NH3 -Cr -K	N0674-70	1	1	1	4	1	1	2	1	1	4	X	1	1	1	1	1	4	1
Ambrex 33 (Mobil)	N0674-70	1	1	4	1	1	1	2	2	4	1	2	4	4	4	4	3	3	4
Ambrex 830 (Mobil)	N0674-70	1	1	3	1	1	1	2	2	4	1	1	3	4	4	4	2	1	2
Amines-Mixed	C0873-70	4	4	2	4	3	2	3	2	2	4	4	2	2	2	2	4	4	2
Aminoanthraquinone	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Aminoazobenzene	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Aminobenzene Sulfonic Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Aminobenzoic Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Aminopyridine	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Aminosalicylic Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Ammonia (Anhydrous)	C0873-70	2	2	1	4	3	2	2	1	4	4	4	1	4	4	4	4	4	2
Ammonia and Lithium Metal in Solution	E0540-80	2	2	2	4	4	4	3	X	4	4	4	2	4	4	4	4	4	4
Ammonia, Gas, Cold	C0873-70	1	1	1	4	2	1	2	1	1	4	X	1	1	1	1	1	4	1
Ammonia, Gas, Hot	C0873-70	4	4	2	4	3	2	2	2	4	4	X	2	4	4	4	2	4	X
Ammonia, Liquid (Anhydrous)	C0873-70	2	2	1	4	3	2	2	1	4	4	4	1	4	4	4	2	4	2
Ammonium Acetate	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Arsenate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Benzoate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Bicarbonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Bisulfite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Bromide	N0674-70	1	1	1	1	1	1	1	1	1	X	1	1	X	X	1	1	X	X
Ammonium Carbamate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Carbonate	C0873-70	4	4	1	1	1	1	1	1	1	4	4	1	X	X	1	1	X	X
Ammonium Chloride, 2N	N0674-70	1	1	1	1	1	1	1	1	1	X	1	1	X	X	1	1	X	X
Ammonium Citrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Dichromate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Diphosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Fluoride	N0674-70	1	1	1	1	1	1	1	1	1	X	1	1	X	X	1	1	X	X
Ammonium Fluorosilicate*	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Ammonium Formate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Hydroxide, 3 Molar	E0540-80	1	1	1	3	2	2	2	1	2	4	4	1	2	2	2	1	1	1
Ammonium Hydroxide, Concentrated	E0540-80	4	4	1	4	3	2	2	1	3	4	4	1	3	3	3	1	1	1
Ammonium Iodide	N0674-70	1	1	1	1	1	1	1	1	1	X	1	1	X	X	1	1	X	X
Ammonium Lactate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2

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Ammonium Metaphosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Molybdenate*	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Nitrate, 2N	N0674-70	1	1	1	X	X	X	2	1	1	2	X	1	X	X	3	1	X	X
Ammonium Nitrite	N0674-70	1	1	1	X	1	1	2	1	1	X	X	1	1	1	1	1	X	2
Ammonium Oxalate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Perchlorate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Perchloride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Ammonium Persulfate 10%	E0540-80	4	4	1	X	X	X	2	1	4	4	4	1	X	1	1	X	X	X
Ammonium Persulfate Solution	E0540-80	4	4	1	X	1	1	2	X	4	4	4	1	X	1	1	X	X	X
Ammonium Phosphate	N0674-70	1	1	1	4	1	1	2	1	1	X	X	1	X	1	1	1	X	1
Ammonium Phosphate, Dibasic	N0674-70	1	1	1	X	1	1	2	1	1	X	X	1	X	1	1	1	X	1
Ammonium Phosphate, Mono-Basic	N0674-70	1	1	1	X	1	1	2	1	1	X	X	1	X	1	1	1	X	1
Ammonium Phosphate, Tribasic	N0674-70	1	1	1	X	1	1	2	1	1	X	X	1	X	1	1	1	X	1
Ammonium Phosphite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Picrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Polysulfide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Salicylate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Salts	N0674-70	1	1	1	3	1	1	2	1	1	3	X	1	X	1	1	1	3	1
Ammonium Sulfamate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Sulfate	N0674-70	1	1	1	4	1	1	2	1	2	4	X	1	1	1	1	1	X	X
Ammonium Sulfate Nitrate	N0674-70	1	1	1	4	1	1	2	1	2	4	X	1	1	1	1	1	X	X
Ammonium Sulfide	N0674-70	1	1	1	4	1	1	2	1	2	4	X	1	1	1	1	1	X	X
Ammonium Sulfite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Thiocyanate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Thioglycolate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Thiosulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Tungstate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ammonium Valerate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Amyl Acetate	N0674-70	1	1	3	4	1	1	3	4	4	4	4	3	4	4	4	4	4	4
Amyl Alcohol	E0540-80	2	2	1	2	1	1	1	2	2	4	4	1	2	2	2	2	1	4
Amyl Borate	N0674-70	1	1	4	1	1	1	2	1	4	X	X	4	4	4	4	1	X	X
Amyl Butyrate	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Amyl Chloride	V1164-75	X	X	4	1	1	1	2	4	4	4	X	4	4	4	4	4	2	4
Amyl Chloronaphthalene	V1164-75	4	4	4	1	1	1	2	4	4	4	X	4	4	4	4	4	2	4
Amyl Cinnamic Aldehyde	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Amyl Laurate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Amyl Mercaptan	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Amyl Naphthalene	V1164-75	4	4	4	1	1	1	2	4	4	2	4	4	4	4	4	4	1	4
Amyl Nitrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Amyl Nitrite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2

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Amyl Phenol	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Amyl Propionate	N0674-70	1	1	4	1	2	1	X	2	4	1	1	4	4	4	4	2	1	2
Anderol, L- 826 (di-ester)	V1164-75	2	2	4	1	1	1	2	4	4	2	4	4	4	4	4	4	2	4
Anderol, L- 829 (di-ester)	V1164-75	2	2	4	1	1	1	2	4	4	2	4	4	4	4	4	4	2	4
Anderol, L-774 (di-ester)	V1164-75	2	2	4	1	1	1	2	4	4	2	4	4	4	4	4	4	2	4
ANG-25 (Di-ester Base) (TG749)	V1164-75	2	2	4	1	1	1	2	4	4	2	4	4	4	4	4	4	2	2
ANG-25 (Glyceral Ester)	E0540-80	2	2	1	1	1	1	1	2	2	4	4	2	2	2	2	2	2	2
Aniline	E0540-80	4	4	2	3	1	1	2	4	4	4	4	2	4	4	4	4	3	4
Aniline Dyes	E0540-80	4	4	2	2	1	1	2	2	2	4	4	2	2	2	2	2	2	3
Aniline Hydrochloride	E0540-80	2	2	2	2	1	1	2	4	3	4	4	2	4	2	2	4	2	3
Aniline Oil	E0540-80	4	4	2	3	2	2	2	4	4	4	4	2	4	4	4	4	3	4
Aniline Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Aniline Sulfite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Animal Fats	N0674-70	1	1	2	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Animal Oil (Lard Oil)	N0674-70	1	1	2	1	1	1	2	2	4	1	2	2	4	4	4	2	1	2
Anisole	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Anisoyl Chloride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
AN-O-3 Grade M	N0674-70	1	1	4	1	1	1	1	2	4	1	1	4	4	4	4	2	1	2
AN-O-366	N0674-70	1	1	4	1	1	1	2	2	4	1	1	4	4	4	4	2	1	4
AN-O-6	N0674-70	1	1	4	1	1	1	1	2	4	1	1	4	4	4	4	2	1	4
Ansul Ether 161 or 181	V3819-75	3	3	3	4	1	1	3	4	4	4	2	3	4	4	4	4	3	4
Anthracene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Anthranilic Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Anthraquinone	V3819-75	X	X	X	X	2	1	X	X	X	X	X	X	X	X	X	X	X	X
Anti-freeze Solutions	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Antimony Chloride	N0674-70	1	1	4	1	1	1	1	2	4	1	1	4	4	4	4	2	1	4
Antimony Pentachloride	N0674-70	1	1	4	1	1	1	1	2	4	1	1	4	4	4	4	2	1	4
Antimony Pentafluoride	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Antimony Sulfate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Antimony Tribromide	N0674-70	1	1	4	1	1	1	1	2	4	1	1	4	4	4	4	2	1	4
Antimony Trichloride	N0674-70	1	1	4	1	1	1	1	2	4	1	1	4	4	4	4	2	1	4
Antimony Trifluoride	N0674-70	1	1	4	1	1	1	1	2	4	1	1	4	4	4	4	2	1	4
Antimony Trioxide	N0674-70	1	1	4	1	1	1	1	2	4	1	1	4	4	4	4	2	1	4
AN-VV-O-366b Hydr. Fluid	N0674-70	1	1	4	1	1	1	1	2	4	2	2	4	4	4	4	2	1	4
Aqua Regia	V3819-75	4	3	3	2	2	2	3	4	X	X	X	X	X	X	X	X	X	X
Arachidic Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Argon	B0612-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Armor All	N0674-70	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Aroclor, 1248	V1164-75	3	3	2	1	1	1	1	4	4	4	4	2	4	4	4	4	2	2
Aroclor, 1254	V1164-75	4	4	2	1	1	1	1	4	4	4	4	4	4	4	4	4	2	3

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Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
Hydrogenated Nitrile	-32°C to 149°C (-23°F to 300°F)*	Polyacrylate	-21°C to 177°C (- 5°F to 350°F)*
Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Aroclor, 1260	V1164-75	1	1	X	1	1	1	1	1	1	4	4	1	1	1	1	1	1	1
Aromatic Fuel -50%	V1164-75	2	2	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Arsenic Acid	E0540-80	1	1	1	1	1	1	1	1	1	3	3	1	1	1	2	1	1	1
Arsenic Oxide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Arsenic Trichloride	N0674-70	1	1	4	4	1	1	X	1	X	X	X	X	X	X	X	X	X	X
Arsenic Trioxide	N0674-70	1	1	4	4	1	1	X	1	X	X	X	X	X	X	X	X	X	X
Arsenic Trisulfide	N0674-70	1	1	4	4	1	1	X	1	X	X	X	X	X	X	X	X	X	X
Arsenites	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Arsine	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Aryl Orthosilicate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Ascorbic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Askarel Transformer Oil	V1164-75	2	2	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Aspartic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Asphalt	V1164-75	2	2	4	1	1	1	2	2	4	2	2	4	4	4	4	2	2	4
ASTM Oil, No. 1	N0674-70	1	1	4	1	1	1	1	1	4	1	1	4	4	4	4	2	1	1
ASTM Oil, No. 2	N0674-70	1	1	4	1	1	1	1	2	4	1	2	4	4	4	4	4	1	4
ASTM Oil, No. 3	N0674-70	1	1	4	1	1	1	1	4	4	1	2	4	4	4	4	4	1	3
ASTM Oil, No. 4	V1164-75	2	2	4	1	1	1	1	4	4	2	4	4	4	4	4	4	2	4
ASTM Oil, No. 5	V1164-75	1	1	4	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
ASTM Reference Fuel A	N0674-70	1	1	4	1	1	1	1	2	4	2	1	4	4	4	4	2	1	4
ASTM Reference Fuel B	N1500-75	1	1	4	1	1	1	1	4	4	4	2	4	4	4	4	4	1	4
ASTM Reference Fuel C	V1164-75	2	2	4	1	1	1	1	4	4	4	4	4	4	4	4	4	2	4
ASTM Reference Fuel D	V1164-75	2	2	4	1	1	1	4	4	X	X	X	X	X	X	X	X	X	X
ATL-857	V1164-75	2	2	4	1	1	1	1	4	4	2	4	4	4	4	4	4	2	4
Atlantic Dominion F	N0674-70	1	1	4	1	1	1	2	2	4	1	2	4	4	4	4	4	1	4
Atlantic Utro Gear-e	N0674-70	1	1	4	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Atlantic Utro Gear-EP Lube	V1164-75	1	1	4	1	1	1	2	2	4	1	1	4	4	4	4	4	1	4
Aure 903R (Mobil)	N0304-75	1	1	4	1	1	1	2	2	4	1	1	4	4	4	2	4	4	4
AUREX 256	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Automatic Transmission Fluid	N0674-70	1	1	4	1	1	1	2	2	4	1	2	4	4	4	4	3	X	4
Automotive Brake Fluid	E0667-70	3	3	1	4	1	1	2	2	1	4	4	2	X	X	X	2	4	3
AXAREL 9100	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Azobenzene	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
— B —																			
Bardol B	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Barium Carbonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Barium Chlorate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Barium Chloride	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Barium Cyanide	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Barium Hydroxide	N0674-70	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	1	1	1
Barium Iodide	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Barium Nitrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Barium Oxide	N0674-70	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	1	1	1
Barium Peroxide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Barium Polysulfide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Barium Salts	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Barium Sulfate	N0674-70	1	1	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X
Barium Sulfide	N0674-70	1	1	1	1	1	1	1	1	2	4	1	1	2	1	1	1	1	1
Bayol 35	N0674-70	1	1	4	1	1	1	2	2	4	1	2	4	4	4	4	4	1	4
Bayol D	N0674-70	1	1	4	1	1	1	2	2	4	1	4	4	4	4	4	4	1	4
Beer	E3609-70	1	1	1	1	1	1	1	1	1	4	2	1	1	1	1	1	1	1
Beet Sugar Liquids	N0674-70	1	1	1	1	1	1	1	1		X	X	X	X	X	X	X	X	X
Beet Sugar Liquors	N0674-70	1	1	1	1	1	1	1	2	1	4	4	1	1	1	1	1	1	1
Benzaldehyde	E0540-80	4	4	1	4	1	1	2	4	4	4	4	1	4	4	4	1	4	2
Benzaldehyde Disulfonic Acid	FF200-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Benzamide	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Benzanthrone	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Benzene	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	3	4
Benzene Hexachloride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Benzenesulfonic Acid 10%	V1164-75	4	4	4	1	1	1	2	2	4	4	4	4	4	4	4	1	2	4
Benzidine	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Benzidine 3 Sulfonic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Benzil	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Benzilic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Benzine (Ligroin)	N0674-70	1	1	4	1	1	1	2	2	4	1	2	4	4	4	4	3	1	4
Benzocatechol	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Benzochloride	V1164-75	4	4	1	1	1	1	1	4	4	4	X	2	4	4	4	4	1	X
Benzoic Acid	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Benzoin	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Benzonitrile	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Benzophenone	V1164-75	X	X	2	1	1	1	2	X	4	4	4	2	4	4	X	X	1	X
Benzoquinone	V1164-75	X	X	2	1	1	1	2	X	4	4	4	2	4	4	X	X	X	X
Benzotrichloride	V1164-75	4	4	1	1	1	1	1	4	X	X	X	X	X	X	X	X	X	X
Benzotrifluoride	V1164-75	4	4	1	1	1	1	1	4	X	X	X	X	X	X	X	X	X	X
Benzoyl Chloride	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Benzoyl Peroxide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Benzoylsulfonilic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Benzyl Acetate	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Benzyl Alcohol	V1164-75	4	4	2	1	1	1	2	2	4	4	4	2	4	4	4	2	2	2

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Benzyl Amine	FF500-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Benzyl Benzoate	V1164-75	4	4	4	1	1	1	2	4	4	4	4	2	4	4	4	4	1	4
Benzyl Bromide	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	1	4
Benzyl Butyl Phthalate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Benzyl Chloride	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	1	4
Benzyl Phenol	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Benzyl Salicylate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Beryllium Chloride	N0674-70	1	1	1	1	1	1	1	3	3	3	3	1	3	3	3	3	3	3
Beryllium Fluoride	N0674-70	1	1	1	1	1	1	1	3	3	3	3	1	3	3	3	3	3	3
Beryllium Oxide	N0674-70	1	1	1	1	1	1	1	3	3	3	3	1	3	3	3	3	3	3
Beryllium Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Bismuth Carbonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Bismuth Nitrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Bismuth Oxychloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Bittern	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Black Liquor	E0540-80	2	X	1	1	4	3	1	1	X	X	X	X	X	X	X	X	X	X
Black Point 77	N0674-70	1	1	1	1	1	1	1	3	3	3	3	1	3	3	3	3	3	3
Blast Furnace Gas	S0604-70	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	1
Bleach Liquor	E0540-80	3	3	1	1	1	1	1	2	3	4	4	1	2	2	3	1	2	2
Bleach Solutions	E0540-80	X	X	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Blood	E3609-70	2	0	1	1	1	1	3	1	X	X	X	X	X	X	X	X	X	2
Borax	E0540-80	2	2	1	1	1	1	1	4	2	2	1	1	2	2	2	4	2	2
Borax Solutions	E0540-80	X	X	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Bordeaux Mixture	E0540-80	2	2	1	1	1	1	1	2	2	4	4	1	2	2	2	1	2	2
Boric Acid	N0674-70	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1
Boric Oxide	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Borneol	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Bornyl Acetate	V1164-75	2	2	4	1	2	1	X	4	4	4	3	4	4	4	4	4	2	X
Bornyl Chloride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Bornyl Formate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Boron Fluids (HEF)	V1164-75	2	2	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Boron Hydride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Boron Phosphate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Boron Tribromide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Boron Trichloride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Boron Trifluoride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Boron Trioxide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
BP Turbine Oil 2197	VM835-75	4	4	4	3	1	1	2	4	4	4	4	4	4	4	4	4	4	4
Brake Fluid DOT 3 (Glycol Type)	E0667-70	3	3	1	4	1	1	2	2	1	X	4	2	X	X	X	2	4	3
Brake Fluid DOT 4	E0667-70	3	3	1	4	1	1	2	2	1	X	4	2	X	X	X	2	4	3

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Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
Hydrogenated Nitrile	-32°C to 149°C (-23°F to 300°F)*	Polyacrylate	-21°C to 177°C (- 5°F to 350°F)*
Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Brake Fluid DOT 5	E0667-70	2	1	1	1	1	1	1	2	X	X	X	1	X	X	X	X	3	4
Bray GG-130	V1164-75	2	2	4	1	1	1	2	4	4	2	4	4	4	4	4	4	2	4
Brayco 719-R (VV-H-910)	E0603-70	3	3	1	4	1	1	2	2	X	4	4	2	2	2	2	2	2	2
Brayco 885 (MIL-L-6085A)	V1164-75	2	2	4	1	1	1	2	4	4	2	1	4	4	4	4	4	2	4
Brayco 910	E0540-80	2	2	1	4	1	1	2	2	2	3	3	1	1	1	1	1	4	4
Bret 710	E0540-80	2	2	1	4	1	1	2	2	2	3	3	1	1	1	1	1	4	4
Brine	N0674-70	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Brine (Seawater)	N0674-70	1	1	1	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Brom - 113	V3819-75	3	3	4	X	X	X	3	4	4	X	X	4	X	X	X	4	X	4
Brom - 114	V3819-75	2	2	4	2	1	1	3	2	4	X	X	4	4	4	4	2	X	4
Bromic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Bromine	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Bromine Pentafluoride	Factory	4	4	4	4	2	2	3	4	4	4	4	4	4	4	4	4	4	4
Bromine Trifluoride	Factory	4	4	4	4	2	2	3	4	4	4	4	4	4	4	4	4	4	4
Bromine Water	V1164-75	4	4	2	1	1	1	3	4	4	4	4	4	4	4	4	1	2	4
Bromobenzene	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	1	4
Bromobenzene Cyanide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Bromochlorotrifluoroethane (Halothane)	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Bromoform	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Bromomethane (Methyl Bromide)	V1164-75	2	2	4	1	1	1	1	4	4	3	X	4	4	4	4	4	1	X
Bromotrifluoroethylene (BFE)	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Bromotrifluoromethane (F-13B1)	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Brucine Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Buffered Oxide Etchants	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Bunker Oil	N0674-70	1	1	4	1	1	1	2	4	4	1	2	4	4	4	4	4	1	2
Bunker's "C" (Fuel Oil)	N0674-70	1	X	X	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Butadiene (Monomer)	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	1	4
Butane	N0674-70	1	1	4	1	1	1	2	1	3	1	1	4	4	4	4	2	3	4
Butane, 2, 2-Dimethyl	N0674-70	1	1	4	1	1	1	2	2	3	1	4	4	4	4	4	2	3	4
Butane, 2, 3-Dimethyl	N0674-70	1	1	4	1	1	1	2	2	3	1	4	4	4	4	4	2	3	4
Butanedial	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Butanol (Butyl Alcohol)	N0674-70	1	1	2	1	1	1	1	1	1	4	4	2	1	1	1	1	1	2
Butene 2-Ethyl (1-Butene 2-Ethyl)	N0674-70	1	1	4	1	1	1	1	4	4	1	4	4	4	4	4	4	3	4
Butter	E1028-70	1	1	1	1	1	1	1	2	X	X	1	3	X	X	X	X	X	2
Butter-Animal Fat	N0508-75	1	1	1	1	1	1	1	2	4	1	1	2	4	4	4	2	1	2
Butyl Acetate or n-Butyl Acetate	E0540-80	4	4	2	4	1	1		4	4	4	4	2	4	4	4	4	4	4
Butyl Acetyl Ricinoleate	E0540-80	2	2	1	1	1	1	1	2	4	X	4	1	4	4	4	2	2	X
Butyl Acrylate	E0540-80	4	4	1	4	1	1	4	4	4	4	X	4	4	4	4	4	4	2
Butyl Alcohol	N0674-70	1	1	2	1	1	1	1	1	1	4	4	2	1	1	1	1	1	2
Butyl Alcohol (Secondary)	V1164-75	2	2	2	1	1	1	1	2	2	4	4	2	2	2	2	2	2	2

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Butyl Alcohol (Tertiary)	V1164-75	2	2	2	1	1	1	1	2	2	4	4	2	2	2	2	2	2	2
Butyl Amine or N-Butyl Amine	N0674-70	1	1	3	4	1	1	3	4	4	4	4	4	4	4	4	4	4	4
Butyl Benzoate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Butyl Benzoate or n-Butyl Benzoate	E0540-80	4	4	1	1	1	1		4	2	4	X	1	4	4	4	4	1	X
Butyl Benzolate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Butyl Butyrate or n-Butyl Butyrate	E0540-80	4	4	1	1	1	1		4	4	4	X	1	4	4	4	4	1	X
Butyl Carbitol	E0540-80	4	4	1	3	1	1	2	3	4	4	X	1	4	4	4	2	4	4
Butyl Cellosolve	E0540-80	3	3	2	4	1	1	2	3	4	4	4	2	4	4	4	4	4	X
Butyl Cellosolve Acetate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Butyl Cellosolve Adipate	E0540-80	4	4	2	2	1	1	2	4	4	4	4	2	4	4	4	4	2	2
Butyl Chloride	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Butyl Ether or n-Butyl Ether	V3819-75	3	3	3	4	1	1		4	4	4	3	3	4	4	4	4	3	4
Butyl Glycolate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Butyl Lactate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Butyl Laurate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Butyl Mercaptan (Tertiary)	V1164-75	4	4	4	1	1	1		4	4	4	4	4	4	4	4	4	X	4
Butyl Methacrylate	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Butyl Oleate	V1164-75	4	4	2	1	1	1	2	4	4	X	X	2	4	X	4	4	2	X
Butyl Oxalate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Butyl Stearate	V1164-75	2	2	4	1	1	1	2	4	4	X	X	4	4	4	4	4	2	X
Butylbenzoic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Butylene	V1164-75	2	2	4	1	1	1	2	3	4	4	4	4	4	4	4	4	2	4
Butyraldehyde	E0540-80	4	4	2	4	1	1	2	4	4	4	4	2	4	4	4	4	4	4
Butyric Acid	V1164-75	4	4	2	2	1	1	1	4	4	4	X	2	4	X	X	4	X	X
Butyric Anhydride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Butyrolacetone	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Butyryl Chloride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
— C —																			
Cadmium Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Cadmium Cyanide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Cadmium Nitrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Cadmium Oxide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Cadmium Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Cadmium Sulfide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcine Liquors	N0674-70	1	1	1	1	1	1	1	X	X	4	4	1	X	X	X	X	1	X
Calcium Acetate	E0540-80	2	2	1	4	1	1	2	2	4	4	4	1	4	1	1	2	4	4
Calcium Arsenate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Benzoate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Calcium Bicarbonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Bisulfide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Bisulfite	E0540-80	2	2	1	2	1	1	1	2	2	3	3	1	4	4	4	1	3	3

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Calcium Bromide	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Calcium Carbide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Calcium Carbonate	N0674-70	1	1	1	1	1	1	1	1	1	3	3	1	1	1	1	1	1	1
Calcium Chlorate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Chloride	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Calcium Chromate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Cyanamide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Calcium Cyanide	N0674-70	1	1	1	X	1	1	1	1	1	X	X	1	1	1	1	1	X	1
Calcium Fluoride	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Calcium Gluconate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Hydride	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Calcium Hydrosulfide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Hydroxide	N0674-70	1	1	1	1	1	1	1	1	1	4	2	1	1	1	1	1	1	1
Calcium Hypochlorite	E0540-80	2	2	1	1	1	1	1	2	2	4	4	1	2	2	2	1	2	2
Calcium Hypophosphite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Lactate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Naphthenate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Calcium Nitrate	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Calcium Oxalate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Oxide	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Calcium Permanganate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Calcium Peroxide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Calcium Phenolsulfonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Phosphate	N0674-70	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	X	1
Calcium Phosphate Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Propionate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Pyridine Sulfonate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Calcium Salts	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Calcium Silicate	N0674-70	1	1	1	1	1	1	1	1	1	X	X	1	1	1	1	1	X	X
Calcium Stearate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Calcium Sulfamate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Calcium Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Sulfide	N0674-70	1	1	1	1	1	1	1	1	2	4	1	1	2	2	2	1	1	1
Calcium Sulfite	N0674-70	1	1	1	1	1	1	1	1	2	4	1	1	2	2	2	1	1	1
Calcium Thiocyanate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Calcium Thiosulfate	E0540-80	2	2	1	1	1	1	1	1	2	4	1	1	2	2	2	1	1	1
Calcium Tungstate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Caliche Liquors	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Camphene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Camphor	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X

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Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
Hydrogenated Nitrile	-32°C to 149°C (-23°F to 300°F)*	Polyacrylate	-21°C to 177°C (- 5°F to 350°F)*
Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Camphoric Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Cane Sugar Liquors	N0674-70	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	1	1	1
Capric Acid	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Caproic Acid	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Caproic Aldehyde	E0540-80	X	X	2	4	1	1	3	X	X	4	4	2	2	2	2	X	4	2
Caprolactam	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Capronaldehyde	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Carbamate	V1164-75	3	3	2	1	1	1	1	2	4	4	4	2	4	4	4	2	1	X
Carbazole	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Carbitol	E0540-80	2	2	2	2	1	1	1	2	2	4	4	2	2	2	2	2	2	2
Carbolic Acid (Phenol)	V0494-70	4	4	2	1	1	1	1	4	4	4	3	2	4	4	4	4	1	4
Carbon Bisulfide	V1164-75	4	4	4	1	1	1	2	4	4	3	X	4	4	4	4	4	1	4
Carbon Dioxide	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Carbon Dioxide (Explosive Decompression Use)	E0962-90	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Carbon Disulfide	V1164-75	4	4	4	1	1	1	2	4	4	3	X	4	4	4	4	4	1	4
Carbon Fluorides	V1164-75	2	2	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Carbon Monoxide	N0674-70	1	1	1	1	1	1	1	2	2	X	1	1	2	2	2	2	2	1
Carbon Tetrabromide	V1164-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Carbon Tetrachloride	V1164-75	2	2	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Carbon Tetrafluoride	V1164-75	2	2	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Carbonic Acid	E0540-80	2	2	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1
Casein	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Castor Oil	N0674-70	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Caustic Lime	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Caustic Potash	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Caustic Soda (Sodium Hydroxide)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Cellosolve	E0540-80	4	4	2	4	1	1	3	4	4	4	4	2	4	4	4	4	4	4
Cellosolve, Acetate	E0540-80	4	4	2	4	1	1	2	4	4	4	4	2	4	4	4	4	4	4
Cellosolve, Butyl	E0540-80	4	4	2	4	1	1	2	4	4	4	4	2	4	4	4	4	4	4
Celluguard	N0674-70	1	1	1	1	1	1	1	1	1	3	4	1	1	1	1	1	1	1
Cellulose Acetate	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Cellulose Acetate Butyrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Cellulose Ether	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Cellulose Nitrate*	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Cellulose Tripropionate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Cellulube (Phosphate Esters)	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cellutherm 2505A	V1164-75	2	2	4	1	1	1	2	4	4	2	4	4	4	4	4	4	2	4
Cerium Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Cerous Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Cerous Fluoride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2

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Cerous Nitrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Cesium Formate	E0962-90	X	X	2	4	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cetane (Hexadecane)	N0674-70	1	1	4	1	1	1	2	2	4	1	4	4	4	4	4	2	3	4
Cetyl Alcohol	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Chaulmoogric Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
China Wood Oil (Tung Oil)	N0674-70	1	1	4	1	1	1	2	2	4	X	3	3	4	4	4	3	2	4
Chloral	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Chloramine	E1257-70	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Chloranthraquinone	V1164-75	2	2	4	1	2	1	X	4	4	4	3	4	4	4	4	4	2	X
Chlordane	V1164-75	2	2	4	1	1	1	2	3	4	X	X	4	4	4	4	3	2	4
Chlorextol	V1164-75	2	2	4	1	1	1	2	2	4	2	4	4	4	4	4	4	2	4
Chloric Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Chlorinated Solvents, Dry	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	1	4
Chlorinated Solvents, Wet	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	1	4
Chlorine (Dry)	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Chlorine (Plasma)	V3819-75	X	X	X	X	3	2	X	X	X	X	X	X	X	X	X	X	X	X
Chlorine (Wet)	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Chlorine Dioxide	V1164-75	4	4	3	1	1	1	2	4	4	4	4	3	4	4	4	3	2	X
Chlorine Dioxide, 8% Cl as NaClO2 in solution	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	X
Chlorine Trifluoride	Factory	4	4	4	4	2	2	4	4	4	4	4	4	4	4	4	4	4	4
Chlorine Water (Chemical Processing)	V1164-75	3	3	2	1	1	1	1	4	X	X	X	X	X	X	X	X	X	X
Chloro 1-Nitro Ethane (1-Chloro 1-Nitro Ethane)	Factory	4	4	4	4	1	1	3	4	4	4	4	4	4	4	4	4	4	4
Chloro Oxyfluorides	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Chloro Xylenols	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Chloroacetaldehyde	E0540-80	3	3	1	3	2	2	X	1	1	4	4	1	1	1	1	1	1	2
Chloroacetic Acid	E0540-80	4	4	2	4	1	1	2	4	4	4	4	2	4	4	4	1	4	X
Chloroacetone	E0540-80	4	4	1	4	2	1	2	4	4	4	4	2	4	4	4	4	4	4
Chloroacetyl Chloride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Chloroamino Benzoic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Chloroaniline	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Chlorobenzaldehyde	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Chlorobenzene	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Chlorobenzene (Mono)	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Chlorobenzene Chloride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Chlorobenzene Trifluoride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Chlorobenzochloride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Chlorobenzotrifluoride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Chlorobromo Methane	V1164-75	4	4	2	1	1	1	1	4	4	4	4	2	4	4	4	4	2	4
Chlorobromopropane	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Chlorobutadiene	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4

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Chlorobutane (Butyl Chloride)	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Chlorododecane	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	1	4
Chloroethane	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Chloroethane Sulfonic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Chloroethylbenzene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Chloroform	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	4	4
Chlorohydrin	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Chloronaphthalene or o-Chloronaphthalene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Chloronitrobenzene	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Chlorophenol or o-Chlorophenol	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Chloropicrin	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Chloroprene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Chlorosilanes	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Chlorosulfonic Acid	Factory	4	4	4	4	1	1	4	4	4	4	4	4	4	4	4	4	4	4
Chlorotoluene	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Chlorotoluene Sulfonic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Chlorotoluidine	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Chlorotrifluoroethylene (CTFE)	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Chlorox	E0540-80	2	2	1	1	1	1	1	2	4	4	4	2	4	4	4	2	1	X
Chloroxylols	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cholesterol	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Chrome Alum	N0674-70	1	1	1	1	1	1	1	1	1	4	X	1	1	1	1	1	X	1
Chrome Plating Solutions	V1164-75	4	4	2	1	1	1	1	4	4	4	4	2	4	4	4	4	2	2
Chromic Acid	V1164-75	4	4	2	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Chromic Chloride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Chromic Fluorides	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Chromic Hydroxide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Chromic Nitrates	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Chromic Oxide	V1164-75	4	4	2	1	1	1	1	4	X	X	X	X	X	X	X	X	X	X
Chromic Phosphate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Chromic Sulfate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Chromium Potassium Sulfate (Alum)	V1164-75	2	X	2	1	1	1	2	X	X	X	X	X	X	X	X	X	X	X
Chromyl Chlorides	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cinnamic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Cinnamic Alcohol	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Cinnamic Aldehyde	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Circo Light Process Oil	N0674-70	1	1	4	1	1	1	2	2	4	1	1	4	4	4	4	2	1	4
Citric Acid	C0873-70	1	1	1	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1
City Service #65 #120 #250	N0674-70	1	1	4	1	1	1	2	2	4	1	2	4	4	4	4	4	1	4
City Service Koolmoter-AP Gear Oil 140-EP Lube	N0674-70	1	1	4	1	1	1	2	2	4	1	1	4	4	4	4	2	1	4

Approximate Service Temperature Ranges for Commonly Used Basic Polymer Types*

Nitrile (General Service)	-34°C to 121°C (-30°F to 250°F)*	AFLAS	-9°C to 232°C (15°F to 450°F)*
Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
Hydrogenated Nitrile	-32°C to 149°C (-23°F to 300°F)*	Polyacrylate	-21°C to 177°C (- 5°F to 350°F)*
Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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3 - Doubtful (sometimes OK for static seal)
4 - Unsatisfactory
x - Insufficient Data

	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
City Service Pacemaker #2	N0674-70	1	1	4	1	1	1	2	2	4	1	2	4	4	4	4	4	1	4
Clorox	E0540-80	2	2	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Coal Tar	N0674-70	1	X	X	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cobalt Chloride	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Cobalt Chloride, 2N	N0674-70	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	1	1	1
Cobaltous Acetate	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Cobaltous Bromide	N0674-70	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	1	1	1
Cobaltous Linoleate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cobaltous Naphthenate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cobaltous Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Coconut Oil	N0674-70	1	1	3	1	1	1	2	3	4	1	3	3	4	4	4	3	1	1
Cod Liver Oil	N0674-70	1	1	1	1	1	1	1	2	4	1	1	1	4	4	4	2	1	2
Codeine	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Coffee	N0508-75	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	1	1	1
Coke Oven Gas	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	2
Coliche Liquors	C0873-70	2	2	2	X	X	X	2	1	2	X	X	2	1	1	1	X	X	X
Convelex 10	Factory	4	4	X	X	X	X	X	4	4	X	2	4	4	4	4	4	X	4
Coolanol 20 25R 35R 40& 45A (Monsanto)	V1164-75	1	1	3	1	1	1	2	2	4	4	1	4	4	4	4	2	1	4
Copper Acetate	E0540-80	2	2	1	4	1	1	2	2	4	4	4	1	4	1	1	2	4	4
Copper Ammonium Acetate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Copper Carbonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Copper Chloride	N0674-70	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1
Copper Cyanide	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Copper Gluconate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Copper Naphthenate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Copper Nitrate	V1164-75	2	X	2	1	1	1	2	X	X	X	X	X	X	X	X	X	X	X
Copper Oxide	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Copper Salts	N0674-70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Copper Sulfate	N0674-70	1	1	1	1	1	1	1	1	2	4	1	2	2	2	2	1	1	1
Copper Sulfate 10%	N0674-70	1	1	1	1	1	1	1	1	2	4	2	2	2	2	2	1	1	1
Copper Sulfate 50%	N0674-70	1	1	1	1	1	1	1	1	2	4	3	2	2	2	1	1	1	1
Corn Oil	N0674-70	1	1	3	1	1	1	2	3	4	1	1	3	4	4	4	2	1	1
Cottonseed Oil	N0674-70	1	1	3	1	1	1	2	3	4	1	1	3	4	4	4	2	2	1
Creosote, Coal Tar	N0674-70	1	1	4	1	1	1	2	2	4	1	3	4	4	4	4	4	1	4
Creosote, Wood	N0674-70	1	1	4	1	1	1	2	2	4	1	3	4	4	4	4	4	1	4
Cresol (Methyl Phenol)	V1164-75	X	X	X	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cresols	V0834-70	4	4	4	2	1	1	2	4	4	4	X	4	4	4	4	4	X	4
Cresylic Acid	V0834-70	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	X	4
Crotonaldehyde	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Crotonic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X

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Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Crude Oil	V1164-75	2	2	4	1	1	1	2	4	4	1	X	4	4	4	4	4	2	4
Cumaldehyde	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Cumene	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Cumene Hydroperoxide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cupric Sulfate	V1164-75	2	X	2	1	1	1	2	X	X	X	X	X	X	X	X	X	X	X
Cutting Oil	N0674-70	1	1	4	1	1	1	2	2	4	1	1	4	4	4	4	2	1	4
Cyanamide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cyanides	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cyanogen Chloride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cyanogen Gas	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cyanohydrin	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cyanuric Chloride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cyclohexane	N0674-70	1	1	4	1	1	1	2	3	4	2	1	4	4	4	4	4	1	4
Cyclohexanol	N0674-70	1	1	4	1	1	1	2	2	4	X	X	4	4	4	4	2	1	4
Cyclohexanone	E0540-80	4	4	2	4	1	1	3	4	4	4	4	2	4	4	4	4	4	4
Cyclohexene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Cyclohexylamine	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Cyclohexylamine Carbonate	FF500-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Cyclohexylamine Laurate	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Cyclopentadiene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Cyclopentane	N0674-70	1	1	4	1	1	1	2	3	4	2	1	4	4	4	4	4	1	4
Cyclopolyolefins	V1164-75	1	1	4	1	1	1	2	3	4	2	1	4	4	4	4	4	1	4
Cymene or p-Cymene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
— D —																			
DDT (Dichlorodiphenyltrichloroethane)	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Decalin	V1164-75	4	4	4	1	1	1	2	4	4	X	X	4	4	4	4	4	1	4
Decane	N0674-70	1	1	4	1	1	1	2	3	4	1	2	4	4	4	4	3	1	2
Delco Brake Fluid	E0667-70	3	3	1	4	1	1	2	2	1	X	X	2	X	X	X	2	4	3
Denatured Alcohol	N0674-70	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	1	1	1
Detergent, Water Solution	E0540-80	1	1	1	1	1	1	1	2	2	4	4	1	2	2	2	2	1	1
Developing Fluids (Photo)	N0674-70	1	1	2	1	1	1	1	1	2	X	X	2	2	1	1	1	1	1
Dexron	N0674-70	1	1	4	1	1	1	2	2	4	1	2	4	4	4	4	4	2	4
Dextrin	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Dextro Lactic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Dextron	N0674-70	1	1	4	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Dextrose	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
DF200	E0540-80	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
DI Water	E0540-80	2	X	1	2	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Diacetone	E0540-80	4	4	1	4	1	1	2	4	4	4	4	1	4	4	4	4	4	4
Diacetone Alcohol	E0540-80	4	4	1	4	1	1	2	2	4	4	4	1	4	4	4	2	4	4

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Dialkyl Sulfates	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Diallyl Ether	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Diallyl Phthalate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Diamylamine	N0674-70	1	1	4	1	2	1	X	2	4	1	1	4	4	4	4	2	1	2
Diazinon	V1164-75	3	3	4	2	1	1	2	3	4	X	X	4	4	4	4	3	2	4
Dibenzyl (sym-Diphenylethane)	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dibenzyl Ether	Factory	4	4	2	4	1	1	2	4	4	X	2	2	4	4	4	4	X	X
Dibenzyl Sebacate	V1164-75	4	4	2	2	1	1	2	4	4	4	2	2	4	4	4	4	3	3
Diborane	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Dibromoethane	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dibromoethyl Benzene	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Dibutyl Cellosolve Adipate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Dibutyl Ether	Factory	4	4	3	3	1	1	3	4	4	3	2	3	4	4	4	4	3	4
Dibutyl Methylenedithio Glycolate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dibutyl Phthalate	E0540-80	4	4	2	3	2	1	3	4	4	4	3	3	4	4	4	4	3	2
Dibutyl Sebacate	E0540-80	4	4	2	2	1	1	2	4	4	4	4	2	4	4	4	4	2	2
Dibutyl Thioglycolate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dibutyl Thiourea	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dibutylamine	E0540-80	4	4	1	4	1	1	4	3	4	4	4	4	4	4	4	4	4	3
Dichloroacetic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dichloroaniline	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Dichlorobenzene or o-Dichlorobenzene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Dichlorobenzene or p-Dichlorobenzene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Dichlorobutane	V1164-75	2	2	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Dichlorobutene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dichlorodiphenyl-Dichloroethane (DDD)	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dichloroethane	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dichloroethylene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dichlorohydrin	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Dichloroisopropyl Ether	Factory	4	4	3	3	1	1	3	4	4	3	2	4	4	4	4	4	3	4
Dichloromethane	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dichlorophenol	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dichlorophenoxyacetic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dichloropropane	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dichloropropene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dichlorosilane	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Dicyclohexylamine	N0674-70	1	1	4	4	1	1	4	4	4	4	4	4	4	4	4	4	4	2
Dicyclohexylammonium Nitrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Dicyclopentadiene	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Dieldrin	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X

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Nitrile (General Service)	-34°C to 121°C (-30°F to 250°F)*	AFLAS	-9°C to 232°C (15°F to 450°F)*
Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
Hydrogenated Nitrile	-32°C to 149°C (-23°F to 300°F)*	Polyacrylate	-21°C to 177°C (- 5°F to 350°F)*
Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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x - Insufficient Data

	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Diesel Oil	N0674-70	1	1	4	1	1	1	2	3	4	1	3	4	4	4	4	3	1	4
Di-ester Lubricant MIL-L-7808	V1164-75	2	2	4	1	1	1	2	4	4	2	4	4	4	4	4	4	2	4
Di-ester Synthetic Lubricants	V1164-75	2	2	4	1	1	1	2	4	4	2	4	4	4	4	4	4	2	4
Diethanolamine (DEA)	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Diethyl Benzene	V1164-75	X	X	X	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Diethyl Carbonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Diethyl Ether	Factory	4	4	4	4	1	1	4	3	4	3	1	4	4	4	4	4	3	4
Diethyl Phthalate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Diethyl Sebacate	V1164-75	2	2	2	2	1	1	2	4	4	4	4	2	4	4	4	4	2	2
Diethyl Sulfate	E0540-80	4	X	1	3	1	1	2	4	X	X	X	X	X	X	X	X	X	2
Diethylamine	E0540-80	2	X	1	4	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Diethylaniline	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Diethylene Glycol	E0540-80	1	1	1	1	1	1	1	1	1	2	4	1	1	1	1	1	1	2
Diethylene Glycol B	V3819-75	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Diethylenetriamine	FF500-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Difluorodibromomethane	E0540-80	4	4	2	X	1	1	2	4	4	4	4	2	4	4	4	4	X	4
Difluoroethane	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Difluoromonochloroethane	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Diglycol Chloroformate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Diglycolamine	C0873-70	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Diglycolic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Dihydroxydiphenylsulfone	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Diisobutyl Ketone	E0540-80	X	X	1	X	2	1	1	X	X	X	X	1	X	X	X	X	X	X
Diisobutylcarbinol	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Diisobutylene	V1164-75	2	2	4	1	1	1	2	4	4	4	4	4	4	4	4	4	3	4
Diisooctyl Sebacate	V1164-75	3	3	3	2	1	1	2	4	4	4	4	4	4	4	4	4	3	3
Diisopropyl Ether (DIPE)	V3819-75	X	X	X	X	2	1	X	X	X	X	X	X	X	X	X	X	X	X
Diisopropyl Ketone	E0540-80	4	4	1	4	2	1	2	4	4	4	4	1	4	4	4	4	4	4
Diisopropylbenzene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Diisopropylidene Acetone	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dimethoxyethane (DME)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dimethyl Acetamide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	4	2
Dimethylaniline (Xylidine)	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dimethyldisulfide (DMDS)	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Dimethyl Ether	N0674-70	1	X	2	2	1	1	4	3	X	X	X	X	X	X	X	X	X	X
Dimethyl Formaldehyde	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Dimethyl Formamide (DMF)	E0540-80	2	2	1	4	1	1	2	3	4	4	4	2	X	X	4	4	4	2
Dimethylhydrazine	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Dimethyl Phenyl Carbinol	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dimethyl Phenyl Methanol	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X

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Dimethyl Phthalate	V1164-75	4	4	2	2	1	1	2	4	4	4	X	2	4	4	4	4	2	X
Dimethyl Sulfoxide (DMSO)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Dimethyl Terephthalate (DMT)	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dimethylamine (DMA)	E0540-80	2	2	1	4	1	1	2	2	2	4	3	2	2	2	2	3	4	2
Dinitrochlorobenzene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dinitrogen Tetroxide	FF500-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Dinitrotoluene (DNT)	Factory	4	4	4	4	1	1	4	4	4	4	4	4	4	4	4	4	4	4
Dioctyl Phthalate	V1164-75	4	4	2	2	1	1	2	4	4	4	4	2	4	4	4	4	2	3
Dioctyl Sebacate	E0540-80	4	4	2	2	1	1	2	4	4	4	2	2	4	4	4	4	3	3
Dioctylamine	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Dioxane	E0540-80	4	4	2	4	1	1	3	4	4	4	4	2	4	4	4	4	4	4
Dioxolane	E0540-80	4	4	2	4	1	1	3	4	4	4	4	3	4	4	4	4	4	4
Dipentene	N0674-70	2	2	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Diphenyl	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	4
Diphenyl Oxides	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	4	4	4	4	2	3
Diphenylamine (DPA)	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Diphenylene Oxide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Diphenylpropane	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Disilane	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Di-Tert-Butyl Peroxide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
D-Limonene		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dodecylbenzene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Dow Chemical 50-4	E0540-80	X	X	1	4	3	2	2	2	1	X	X	2	X	X	X	2	4	X
Dow Chemical ET378	Factory	4	4	X	X	X	X	X	4	4	3	2	4	4	4	4	4	X	4
Dow Chemical ET588	E0540-80	3	3	1	4	3	2	2	2	1	X	X	2	X	X	X	2	4	X
Dow Corning -11	E0540-80	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Dow Corning 1208, 4050, 6620, F-60, XF-60	N0674-70	1	1	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X
Dow Corning -1265 Fluorosilicone Fluid	E0540-80	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1
Dow Corning -200	E0540-80	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3
Dow Corning -220	N0674-70	1	1	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X
Dow Corning -3	E0540-80	2	2	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	2
Dow Corning -33	E0540-80	2	2	1	1	1	1	X	1	1	1	1	1	1	1	1	1	2	3
Dow Corning -4	E0540-80	2	2	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	2
Dow Corning -44	E0540-80	2	2	1	1	1	1	X	1	1	1	1	1	1	1	1	1	2	3
Dow Corning -5	E0540-80	2	2	1	1	1	1	X	1	1	1	1	1	1	1	1	1	2	3
Dow Corning -510	E0540-80	2	2	1	1	1	1	X	1	1	1	1	1	1	1	1	1	2	3
Dow Corning -55	E0540-80	2	2	1	1	1	1	X	1	1	1	1	1	1	1	1	1	2	3
Dow Corning -550	E0540-80	2	2	1	1	1	1	X	1	1	1	1	1	1	1	1	1	2	3
Dow Corning -704	E0540-80	2	2	1	1	1	1	X	1	1	1	1	1	1	1	1	1	2	3
Dow Corning -705	E0540-80	2	2	1	1	1	1	X	1	1	1	1	1	1	1	1	1	2	3

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Dow Corning -710	E0540-80	2	2	1	1	1	1	X	1	1	1	1	1	1	1	1	1	2	3
Dow Corning F-61	N0674-70	1	1	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X
Dow Guard	N0674-70	1	1	1	1	1	1	X	1	1	3	3	1	1	1	1	1	1	1
Dowanol P Mix	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Dowtherm, 209	E0540-80	3	3	1	4	1	1	X	2	X	X	X	2	X	X	X	X	3	3
Dowtherm, A	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Dowtherm, E	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Drinking Water	E3609-70	1	1	1	1	1	1	X	2	1	4	4	1	1	1	1	1	1	1
Dry Cleaning Fluids	V1164-75	3	3	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
DTE 20 Series, Mobil	V1164-75	2	2	4	1	1	1	2	1	X	2	1	4	X	X	2	2	2	4
DTE named series, Mobil, light-heavy	N0674-70	1	1	4	1	1	1	2	2	4	X	1	4	4	X	3	1	1	3
— E —																			
Elco 28-EP lubricant	N0674-70	1	1	4	1	1	1	X	3	4	1	1	4	4	4	4	4	1	2
Epichlorohydrin	E0540-80	4	4	2	4	1	1	X	4	4	4	4	2	4	4	4	4	4	4
Epoxy Resins	E0540-80	X	X	1	4	1	1	X	1	X	X	X	1	X	X	X	X	X	X
Erucic Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Esam-6 Fluid	E0540-80	X	X	1	4	1	1	X	2	1	X	X	2	X	X	X	2	4	X
Esso Fuel 208	N0674-70	1	1	4	1	1	1	X	2	4	1	4	4	4	4	4	3	1	4
Esso Golden Gasoline	V1164-75	2	2	4	1	1	1	X	4	4	4	4	4	4	4	4	4	1	4
Esso Motor Oil	N0674-70	1	1	4	1	1	1	X	3	4	1	4	4	4	4	4	4	1	4
Esso Transmission Fluid (Type A)	N0674-70	1	1	4	1	1	1	X	2	4	1	3	4	4	4	4	4	1	4
Esso WS2812 (MIL-L-7808A)	V1164-75	1	1	4	1	1	1	X	4	4	2	4	4	4	4	4	4	1	4
Esso XP90-EP Lubricant	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Esstic 42, 43	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4
Ethane	N0674-70	1	1	4	1	1	1	X	2	4	1	3	4	4	4	4	2	3	4
Ethanol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ethanol Amine	E0540-80	2	2	1	4	1	1	X	2	2	4	3	2	2	2	2	3	4	2
Ethers	V3819-75	4	4	3	3	1	1	X	4	4	3	2	4	4	4	4	4	3	4
Ethoxyethyl Acetate (EGMEEA)	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Ethyl Acetate-Organic Ester	E0540-80	4	4	2	4	2	1	X	4	4	4	4	2	4	4	4	4	4	2
Ethyl Acetoacetate	E0540-80	4	4	2	4	1	1	X	4	3	4	4	2	3	3	3	4	4	2
Ethyl Acrylate	E0540-80	4	4	2	4	1	1	X	4	4	4	4	2	4	4	4	4	4	2
Ethyl Alcohol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ethyl Ammonium Dichloride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Ethyl Benzene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	1	4
Ethyl Benzoate	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	1	4
Ethyl Bromide	V1164-75	2	2	4	1	1	1	X	4	X	X	X	4	4	4	4	4	1	X

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3 - Doubtful (sometimes OK for static seal)
4 - Unsatisfactory
x - Insufficient Data

	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Ethyl Cellosolve	E0540-80	4	4	2	4	1	1	X	4	4	4	4	2	4	4	4	4	4	4
Ethyl Cellulose	N0674-70	2	2	2	4	1	1	X	2	2	4	2	2	2	2	2	2	4	2
Ethyl Chloride	N0674-70	1	1	3	1	1	1	X	4	4	3	2	4	2	1	4	4	1	4
Ethyl Chlorocarbonate	V1164-75	4	4	2	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Ethyl Chloroformate	E0540-80	4	4	2	4	1	1	X	4	4	4	4	3	4	4	4	4	4	4
Ethyl Ether	Factory	3	3	3	4	1	1	X	4	4	4	2	3	4	4	4	4	3	4
Ethyl Formate	V1164-75	4	4	2	1	1	1	X	2	4	X	X	2	4	4	4	2	1	X
Ethyl Hexanol	N0674-70	1	1	1	1	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ethyl Lactate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ethyl Mercaptan	V1164-75	4	4	X	2	1	1	X	3	4	X	X	4	4	4	4	3	X	3
Ethyl Nitrite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ethyl Oxalate	E0540-80	4	4	1	2	1	1	X	4	4	4	X	4	4	1	4	4	2	4
Ethyl Pentachlorobenzene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Ethyl Pyridine	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Ethyl Silicate	E0540-80	1	1	1	1	1	1	X	1	2	X	X	1	2	2	2	2	1	X
Ethyl Stearate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Ethyl Sulfate	E0540-80	X	X	1	4	1	1	1	X	X	X	X	X	X	X	X	X	X	X
Ethyl Tertiary Butyl Ether	V3819-75	X	X	X	X	2	1	X	X	X	X	X	X	X	X	X	X	X	X
Ethyl Valerate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Ethylacrylic Acid	E0540-80	4	4	2	X	X	X	X	2	4	4	4	2	4	4	4	4	4	4
Ethylamine	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ethylcyclopentane	N0674-70	1	1	4	1	1	1	X	3	4	2	1	4	4	4	4	4	1	4
Ethylene	V1164-75	3	2	4	2	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Ethylene Chloride	V1164-75	4	4	4	2	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Ethylene Chlorohydrin	V1164-75	4	4	2	1	1	1	X	2	2	4	4	2	2	2	2	2	2	3
Ethylene Cyanohydrin	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Ethylene Diamine	E0540-80	1	1	1	4	2	2	X	1	2	4	4	1	2	1	1	2	4	1
Ethylene Dibromide	V1164-75	4	4	3	1	1	1	X	4	4	4	4	3	4	4	4	4	3	4
Ethylene Dichloride	V1164-75	4	4	3	1	1	1	X	4	4	4	4	3	4	4	4	4	3	4
Ethylene Glycol	E0540-80	1	1	1	1	1	1	X	1	1	4	2	1	1	1	1	1	1	1
Ethylene Hydrochloride	V1164-75	4	4	3	1	1	1	X	4	4	4	4	3	4	4	4	4	3	4
Ethylene Oxide	V8545-75	4	4	3	4	1	1	X	4	4	4	4	3	4	4	4	4	4	4
Ethylene Oxide, (12%) and Freon 12 (80%)	V3819-75	3	3	2	4	4	2	X	4	4	4	4	2	4	4	4	4	4	4
Ethylene Trichloride	V1164-75	4	4	3	1	1	1	X	4	4	4	4	3	4	4	4	4	3	4
Ethyleneimine	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Ethylmorpholene Stannous Octotate (50/50 mixture)	E0540-80	4	4	2	4	1	1	X	X	4	X	X	2	X	X	X	X	X	X
Ethylmorpholine	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Ethylsulfuric Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2

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Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
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— F —																			
F-60 Fluid (Dow Corning)	E0540-80	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	4
F-61 Fluid (Dow Corning)	E0540-80	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	4
Fatty Acids	V1164-75	2	2	3	1	1	1	X	2	4	X	X	3	4	4	4	2	X	3
FC-43 Heptacosofluorotri-butylamine	N0674-70	1	1	1	1	1	1	X	1	4	X	X	1	X	X	X	1	1	1
FC75 & FC77 (Fluorocarbon)	E0540-80	1	1	1	2	1	1	X	1	4	X	X	1	X	X	X	1	2	1
Ferric Acetate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ferric Ammonium Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ferric Chloride	N0674-70	1	1	1	1	1	1	X	2	1	1	1	1	1	1	1	2	1	2
Ferric Ferrocyanide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ferric Hydroxide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ferric Nitrate	N0674-70	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	2
Ferric Persulfate	N0674-70	1	1	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X
Ferric Sulfate	N0674-70	1	1	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X
Ferrous Ammonium Citrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ferrous Ammonium Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ferrous Carbonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ferrous Chloride	N0674-70	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Ferrous Iodide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ferrous Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ferrous Tartrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Fish Oil	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Fisher Reagent	E0540-80	X	X	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Fluorinated Cyclic Ethers	V3819-75	X	X	1	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Fluorine (Gas)	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Fluorine (Liquid)	V1164-75	4	4	4	2	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Fluorobenzene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Fluoroboric Acid	N0674-70	1	X	1	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Fluorocarbon Oils	E0540-80	X	X	1	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Fluoroform (Trifluoromethane)	FF500-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Fluorolube	E0540-80	1	1	1	2	1	1	X	1	4	X	X	1	X	X	X	1	2	1
Fluorophosphoric Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Fluorosilicic Acid	N0674-70	1	1	2	2	1	1	1	1	X	X	X	X	X	X	X	X	X	X
Fluorosulfonic Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Formaldehyde	E0540-80	3	3	2	4	1	1	X	3	3	4	4	2	2	2	2	2	4	2
Formamide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	3	2
Formic Acid	E0540-80	X	X	1	4	1	1	3	1	X	X	X	X	X	X	X	X	X	X
Freon, 11 (Trichlorofluoromethane)	V3819-75	4	4	4	2	2	2	X	4	4	4	X	4	X	X	4	1	2	4
Freon, 112 (Tetrachlorodifluoroethane)	V1164-75	2	2	4	1	1	1	X	2	4	X	X	4	X	X	4	2	X	4
Freon, 113 (Trichlorotrifluoroethane)	C0873-70	1	1	4	2	4	3	X	1	2	X	1	4	X	X	4	1	X	4
Freon, 113 + High and Low Aniline Oil	N0674-70	1	X	X	X	4	3	4	X	X	X	X	X	X	X	X	X	X	X

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Freon, 114 (Dichlorotetrafluroethane)	C0873-70	1	1	1	1	2	2	X	1	1	X	X	1	X	X	1	X	X	4
Freon, 114B2	C0873-70	2	2	4	2	2	2	X	2	4	X	X	4	X	X	4	1	X	4
Freon, 115, 116	C0873-70	1	1	1	2	2	2	X	1	1	X	X	1	X	X	1	X	X	X
Freon, 12 (Dichlorodifluroethane)	C0873-70	2	2	3	3	2	2	X	1	1	X	1	3	4	4	2	1	3	4
Freon, 12 and ASTM Oil #2 (50/50 Mixture)	V1164-75	2	2	4	1	1	1	X	3	4	X	X	4	4	4	4	2	2	4
Freon, 12 and Suniso 4G (50/50 Mixture)	V1164-75	2	2	4	1	1	1	X	3	4	X	X	4	4	4	4	2	2	4
Freon, 123 (Dichlorotrifluoroethane)	C0873-70	X	X	X	X	4	4	X	X	X	X	X	X	X	X	X	X	X	X
Freon, 124 (Chlorotetrafluoroethane)	C0873-70	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Freon, 125 (Pentafluoroethane)	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Freon, 13 (Chlorotrifluoromethane)	C0873-70	1	1	1	1	1	1	X	1	1	X	X	1	X	1	1	1	4	4
Freon, 134a (Tetrafluoroethane)	C0873-70	1	1	1	4	4	3	X	1	X	X	X	X	X	X	X	X	4	4
Freon, 13B1 (Bromotrifluoromethane)	N0674-70	1	1	1	1	2	2	X	1	1	X	X	1	X	X	1	1	2	4
Freon, 14 (Tetrafluoromethane)	C0873-70	1	1	1	1	1	1	X	1	1	X	1	1	X	X	1	1	X	4
Freon, 141b (Dichlorofluoroethane)	Factory	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Freon, 142b (Chlorotrifluorothane)	V1164-75	2	2	4	2	4	3	4	1	X	X	X	X	X	X	X	X	X	X
Freon, 152a (Difluoroethane)	Factory	X	X	X	X	4	3	X	1	X	X	X	X	X	X	X	X	X	X
Freon, 21	Factory	4	4	4	4	1	1	X	3	4	X	X	4	4	4	4	4	X	4
Freon, 218	N0674-70	1	X	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Freon, 22 (Chlorodifluoromethane)	C0873-70	4	4	3	4	4	4	X	1	1	2	4	3	X	X	1	1	4	4
Freon, 22 and ASTM Oil #2 (50/50 Mixture)	C0873-70	4	4	4	2	1	1	X	2	4	2	X	4	X	X	4	X	2	4
Freon, 23 (Fluoroform) (Trifluoromethane)	Factory	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Freon, 31	C0873-70	4	4	1	4	2	2	X	1	2	X	X	1	X	X	2	2	X	X
Freon, 32	C0873-70	1	1	1	4	2	2	X	1	1	X	X	1	X	X	1	1	X	X
Freon, 356mcf	C0873-70	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Freon, 401a	C0873-70	X	4	1	4	X	X	X	1	X	X	X	X	X	X	X	X	X	X
Freon, 402a	C0873-70	X	3	1	4	X	X	X	1	X	X	X	X	X	X	X	X	X	X
Freon, 404a	C0873-70	X	1	1	4	X	X	X	4	X	X	X	X	X	X	X	X	X	X
Freon, 407c	C0873-70	X	2	X	4	X	X	X	4	X	X	X	X	X	X	X	X	X	X
Freon, 410a	C0873-70	X	2	1	4	X	X	X	1	X	X	X	X	X	X	X	X	X	X
Freon, 410c	C0873-70	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Freon, 502	C0873-70	2	2	1	2	2	2	X	1	1	X	X	1	X	X	1	X	X	X
Freon, 507	C0873-70	X	1	1	4	X	X	X	1	X	X	X	X	X	X	X	X	X	X
Freon, BF (R112)	V1164-75	2	2	4	1	2	2	X	2	4	X	X	4	X	X	4	2	X	4
Freon, C316	N0674-70	1	X	1	1	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Freon, C318	C0873-70	1	1	1	2	2	2	X	1	1	X	X	1	X	X	1	1	X	X
Freon, K-142b	C0873-70	1	1	1	4	4	4	X	1	1	X	X	1	X	X	2	1	X	X
Freon, K-152a	C0873-70	1	1	1	4	4	4	X	1	1	X	X	1	X	X	1	4	X	X
Freon, MF (R11)	N0674-70	2	2	4	2	2	2	X	4	4	X	3	4	X	X	4	1	X	4
Freon, PCA (R113)	N0674-70	1	1	4	2	1	1	X	1	2	X	1	4	X	X	4	1	X	4
Freon, TA	N0674-70	1	X	2	3	2	2	X	X	X	X	X	X	X	X	X	X	X	X

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COMPOUND COMPATIBILITY RATING
1 - Satisfactory
2 - Fair (usually OK for static seal)
3 - Doubtful (sometimes OK for static seal)
4 - Unsatisfactory
x - Insufficient Data

	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Freon, TC	N0674-70	1	X	2	1	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Freon, TF (R113)	N0674-70	1	1	4	2	2	2	X	1	2	X	1	4	X	X	4	1	X	4
Freon, TMC	V1164-75	2	X	3	1	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Freon, T-P35	N0674-70	1	X	1	1	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Freon, T-WD602	V1164-75	2	X	2	1	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Frick #3 Compressor Oil	C0873-70	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Fuel Oil, #6	V1164-75	2	2	4	1	1	1	X	4	4	1	2	4	4	4	4	4	1	1
Fuel Oil, 1, and 2	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	3	1	4
Fuel Oil, Acidic	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	1
Fumaric Acid	N0674-70	1	1	2	1	1	1	X	2	2	4	X	4	2	1	3	2	1	2
Fuming Sulphuric Acid (20/25% Oleum)	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	X	4
Furaldehyde	E0540-80	4	4	2	4	2	2	4	4	X	X	X	X	X	X	X	X	X	X
Furan (Furfuran)	V1164-75	4	4	3	1	1	1	X	4	4	4	X	4	4	4	4	4	X	X
Furfural (Furfuraldehyde)	E0540-80	4	4	2	4	1	1	X	4	4	4	3	2	4	4	4	3	X	4
Furfuraldehyde	E0540-80	4	4	2	4	1	1	X	4	4	4	3	2	4	4	4	3	X	4
Furfuryl Alcohol	E0540-80	4	4	2	X	1	1	X	4	4	4	4	2	4	4	4	4	4	4
Furoic Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Furyl Carbinol	E0540-80	4	4	2	X	X	X	X	4	4	4	4	2	4	4	4	4	4	4
Fyrquel 150 220 300 550	E0540-80	4	4	1	1	1	1	X	4	4	4	4	1	4	4	4	4	2	1
Fyrquel 90, 100, 500	E0540-80	4	4	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X
Fyrquel A60	V3819-75	4	4	2	4	1	1	2	4	X	X	X	X	X	X	X	X	X	X
Fyrquel EHC	E0540-80	3	1	1	1	1	1	1	4	X	4	4	1	X	X	X	X	3	1
— G —																			
Galden	E0740-75	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Gallic Acid	V1164-75	2	2	2	1	1	1	X	2	2	4	4	2	X	1	1	2	1	X
Gasoline	N1500-75	1	1	4	1	1	1	X	4	4	4	2	4	4	4	4	4	1	4
Gelatin	N0674-70	1	1	1	1	1	1	X	1	1	4	4	1	1	1	1	1	1	1
Germane (Germanium Tetrahydride)	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Girling Brake Fluid	E0667-70	3	3	1	4	1	1	X	2	1	X	X	2	X	X	X	2	4	X
Glauber's Salt	V1164-75	4	4	2	1	1	1	X	2	4	4	X	2	4	2	2	2	1	X
Gluconic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Glucose	N0674-70	1	1	1	1	1	1	X	1	1	X	4	1	1	1	1	1	1	1
Glue	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Glutamic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Glycerine (Glycerol)	N0674-70	1	1	1	1	1	1	X	1	1	4	4	1	1	1	1	1	1	1
Glycerol Dichlorohydrin	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Glycerol Monochlorohydrin	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Glycerol Triacetate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2

Approximate Service Temperature Ranges for Commonly Used Basic Polymer Types*

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Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
Hydrogenated Nitrile	-32°C to 149°C (-23°F to 300°F)*	Polyacrylate	-21°C to 177°C (- 5°F to 350°F)*
Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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Glycerophosphoric Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Glyceryl Phosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Glycidol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Glycol Monoether	V3819-75	X	X	X	X	2	1	X	X	X	X	X	X	X	X	X	X	X	X
Glycolic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Glycols	E0540-80	1	1	1	1	1	1	X	1	1	4	4	1	1	1	1	1	1	1
Glycoxylic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Grease Petroleum Base	N0674-70	1	1	4	1	1	1	X	3	4	1	1	4	4	4	4	4	1	4
Green Sulfate Liquor	E0540-80	2	2	1	1	1	1	X	2	2	4	4	1	2	2	2	2	2	X
Gulf Endurance Oils	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
Gulf FR Fluids (Emulsion)	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
Gulf FR G-Fluids	E0540-80	1	1	1	1	1	1	X	1	1	4	2	1	1	1	1	1	1	1
Gulf FR P-Fluids	E0540-80	4	4	2	2	1	1	X	4	4	4	4	2	4	4	4	4	2	1
Gulf Harmony Oils	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
Gulf High Temperature Grease	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
Gulf Legion Oils	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
Gulf Paramount Oils	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4
Gulf Security Oils	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4
Gulfcrown Grease	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
— H —																			
Halothane	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Halowax Oil	V1164-75	4	4	4	1	1	1	X	4	4	X	X	4	4	4	4	4	1	4
Hannifin Lube A	N0674-70	1	1	4	1	1	1	X	1	2	1	1	4	4	4	4	1	1	2
Heavy Water	N0674-70	1	1	1	X	1	1	X	2	1	4	4	1	1	1	1	1	1	1
HEF-2 (High Energy Fuel)	V1164-75	2	2	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Helium	B0612-70	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	1
Heptachlor	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Heptachlorobutene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Heptaldehyde (Heptanal)	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Heptane or n-Heptane	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	2	3	4
Heptanoic Acid	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Hexachloroacetone	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Hexachlorobutadiene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Hexachlorobutene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Hexachloroethane	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Hexaethyl Tetraphosphate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hexafluoroethane (F-116)	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Hexafluoroxylene	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hexafluoroxylene	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hexaldehyde or n-Hexaldehyde	E0540-80	4	4	1	4	1	1	X	1	4	X	2	2	4	4	4	3	4	2

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Hexamethyldisilizane	V8545-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hexamethylene (Cyclohexane)	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Hexamethylene Diammonium Adipate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Hexamethylenediamine	E0540-80	3	3	1	3	2	2	X	1	1	4	4	1	1	1	1	1	1	2
Hexamethylenetetramine	E0540-80	3	3	1	3	2	2	X	1	1	4	4	1	1	1	1	1	1	2
Hexane or n-Hexane	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	2	3	4
Hexene-1 or n-Hexene-1	V1164-75	2	2	4	1	1	1	X	2	4	1	2	4	4	4	4	2	4	4
Hexone (Methyl Isobutyl Ketone)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Hexyl Acetate	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Hexyl Alcohol	N0674-70	1	1	3	1	1	1	X	2	1	4	4	3	1	1	1	2	2	2
Hexylene Glycol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Hexylresorcinol	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
HFC-245fa	C0873-70	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
High Viscosity Lubricant, H2	N0674-70	1	1	1	1	1	1	X	2	1	4	4	1	2	X	X	X	2	1
High Viscosity Lubricant, U4	N0674-70	1	1	1	1	1	1	X	2	1	4	4	1	2	X	X	X	2	1
HiLo MS #1	E0540-80	4	4	1	4	1	1	X	4	4	4	4	2	4	4	4	4	3	3
Houghto-Safe 1010 phosphate ester	E0540-80	4	4	1	1	1	1	X	4	4	4	X	1	4	4	4	4	2	3
Houghto-Safe 1055 phosphate ester	E0540-80	4	4	1	1	1	1	X	4	4	4	X	1	4	4	4	4	2	3
Houghto-Safe 1120 phosphate ester	V1164-75	4	4	2	1	1	1	X	4	4	4	4	1	4	4	4	4	2	3
Houghto-Safe 271 (Water & Glycol Base)	N0674-70	1	1	1	2	1	1	X	2	1	4	4	2	X	X	X	X	2	2
Houghto-Safe 416 & 500 Series	N0674-70	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Houghto-Safe 5040 (Water/Oil emulsion)	N0674-70	1	1	4	1	1	1	X	2	4	4	4	4	4	4	4	4	2	3
Houghto-Safe 620 Water/Glycol	N0674-70	1	1	1	2	1	1	X	2	1	4	4	2	X	X	X	X	2	2
Hydraulic Oil (Petroleum Base, Industrial)	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Hydraulic Oils (Synthetic Base)	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Hydrazine	E0540-80	2	2	1	4	1	1	X	2	2	X	4	1	X	X	1	2	4	2
Hydrazine (Anhydrous)	E0540-80	4	4	2	4	1	1	2	2	1	4	4	2	4	4	4	2	4	X
Hydrazine Dihydrochloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Hydrazine Hydrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Hydriodic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Hydroabietyl Alcohol	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hydrobromic Acid	E0540-80	4	4	1	1	1	1	X	4	4	4	4	1	4	1	1	1	3	4
Hydrobromic Acid 40%	E0540-80	4	4	1	1	1	1	X	2	4	4	4	1	4	1	1	1	3	4
Hydrocarbons, Saturated	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	3	1	4
Hydrochloric Acid (cold) 37%	V1164-75	4	X	3	1	1	1	1	4	X	X	X	X	X	X	X	X	X	X
Hydrochloric Acid (hot) 37%	V1164-75	4	X	3	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Hydrochloric Acid, 3 Molar to 158°F	V1164-75	2	2	1	1	1	1	X	2	3	3	4	1	X	X	3	1	3	4
Hydrochloric Acid, Concentrated Room Temp.	V0834-70	2	2	2	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hydrochloric Acid, Concentrated to 158°F	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	X	X	4	X	4	4
Hydrocyanic Acid	E0540-80	2	2	1	1	1	1	X	2	2	4	X	1	2	1	1	1	2	3

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Hydro-Drive MIH-10 (Petroleum Base)	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	2
Hydro-Drive MIH-50 (Petroleum Base)	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	2
Hydrofluoric Acid (Anhydrous)	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hydrofluoric Acid (conc.) Cold	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hydrofluoric Acid (conc.) Hot	V3819-75	4	X	4	3	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hydrofluorosilicic Acid	E0540-80	2	2	1	1	1	1	X	2	2	X	X	1	X	1	1	1	4	4
Hydrogen Bromide (Anhydrous)	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hydrogen Chloride (Anhydrous)	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hydrogen Chloride gas	E0540-80	4	X	1	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Hydrogen Cyanide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hydrogen Fluoride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hydrogen Fluoride (Anhydrous)	E0540-80	4	4	1	4	1	1	2	X	4	4	X	1	4	4	4	X	4	X
Hydrogen Gas, Cold	E0540-80	1	1	1	1	1	1	X	1	2	2	1	1	1	1	2	1	3	3
Hydrogen Gas, Hot	E0540-80	1	1	1	1	1	1	X	1	2	2	1	1	1	1	2	1	3	3
Hydrogen Iodide (Anhydrous)	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hydrogen Peroxide	V1164-75	2	2	1	1	1	1	X	1	2	4	X	1	2	2	2	2	1	1
Hydrogen Peroxide 90%	V1164-75	4	4	3	1	1	1	X	4	4	4	X	3	4	4	4	3	2	2
Hydrogen Selenide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Hydrogen Sulfide, Dry, Cold	E0540-80	1	1	1	4	1	1	X	1	1	4	X	1	1	1	1	1	3	3
Hydrogen Sulfide, Dry, Hot	E0540-80	4	4	1	4	1	1	X	2	4	4	X	1	4	4	4	3	3	3
Hydrogen Sulfide, Wet, Cold	E0540-80	4	4	1	4	1	1	X	1	4	4	X	1	4	4	4	2	3	3
Hydrogen Sulfide, Wet, Hot	E0540-80	4	4	1	4	1	1	X	2	4	4	X	1	4	4	4	3	3	3
Hydrolube-Water/Ethylene Glycol	N0674-70	1	1	1	1	1	1	X	2	1	4	4	2	X	X	X	X	2	2
Hydrooxycitronellal	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Hydroquinol	V1164-75	4	4	4	1	2	2	X	4	X	X	X	X	X	X	X	X	X	X
Hydroquinone	V1164-75	3	3	2	2	1	1	X	4	4	4	X	4	4	2	2	4	2	X
Hydroxyacetic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Hydyne	E0540-80	2	2	1	4	1	1	X	2	2	4	X	2	2	2	2	X	4	4
Hyjet	E1267-80	4	4	1	4	1	1	2	4	X	X	X	X	X	X	X	X	X	X
Hyjet IV and IVA	E1267-80	4	4	1	4	1	1	X	4	4	4	4	2	4	4	4	4	4	4
Hyjet S4	E1267-80	4	X	1	4	1	1	2	4	X	X	X	X	X	X	X	X	X	X
Hyjet W	E1267-80	4	4	1	4	1	1	2	4	X	X	X	X	X	X	X	X	X	X
Hypochlorous Acid	V0834-70	4	4	2	1	1	1	X	4	4	4	X	2	4	2	2	1	X	X
— I —																			
Indole	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Industron FF44	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4
Industron FF48	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4
Industron FF53	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4
Industron FF80	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4

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Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
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Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Insulin	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Iodic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Iodine	V1164-75	2	2	2	1	1	1	X	4	2	X	X	2	X	4	X	2	1	X
Iodine Pentafluoride	Factory	4	4	4	4	2	2	X	4	4	4	4	4	4	4	4	4	4	4
Iodoform	V1164-75	X	X	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Isoamyl Acetate	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Isoamyl Butyrate	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Isoamyl Valerate	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Isoboreol	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Isobutane	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Isobutyl Acetate	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Isobutyl Alcohol	E0540-80	2	2	1	1	1	1	X	1	2	4	4	1	2	1	1	1	2	1
Isobutyl Chloride	V1164-75	4	4	4	1	1	1	4	4	X	X	X	X	X	X	X	X	X	X
Isobutyl Ether	V3819-75	2	2	4	4	2	1	4	3	X	X	X	X	X	X	X	X	X	X
Isobutyl Methyl Ketone	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Isobutyl n-Butyrate	E0540-80	4	4	1	1	1	1	X	4	4	4	X	1	4	4	4	4	1	X
Isobutyl Phosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Isobutylene	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Isobutyraldehyde	E0540-80	3	2	2	4	2	2	4	3	X	X	X	X	X	X	X	X	X	X
Isobutyric Acid	N0674-70	1	1	2	4	1	1	3	4	X	X	X	X	X	X	X	X	X	2
Isocrotyl Chloride	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Isodecanol	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Isododecane	N0674-70	1	1	4	1	1	1	X	2	4	4	X	4	4	4	4	2	1	4
Isoeugenol	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Isooctane	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	1	1	4
Isopar K	N0674-70	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Isopentane	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Isophorone (Ketone)	E0540-80	4	4	2	4	1	1	X	4	4	4	4	2	4	4	4	4	4	4
Isopropanol	E0540-80	2	2	1	1	1	1	X	2	2	4	4	1	2	1	1	1	2	1
Isopropyl Acetate	E0540-80	4	4	2	4	1	1	X	4	4	4	4	2	4	4	4	4	2	4
Isopropyl Alcohol	E0540-80	2	2	1	1	1	1	X	2	2	4	4	1	2	1	1	1	2	1
Isopropyl Chloride	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Isopropyl Ether	N0674-70	2	2	4	4	1	1	X	3	4	3	2	4	4	4	4	3	3	4
Isopropylacetone	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Isopropylamine	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
— J —																			
Jet Fuel A	V1164-75	2	2	4	1	1	1	2	4	4	4	3	4	4	4	4	4	2	X
JP-10	V1164-75	3	3	4	1	1	1	2	4	4	4	3	4	X	X	4	X	1	4
JP-3 (MIL-J-5624)	N0674-70	1	1	4	1	1	1	2	4	X	X	X	X	X	X	X	X	X	X
JP-4 (MIL-T-5624) (Jet A1)	N0602-70	1	1	4	1	1	1	2	4	4	2	2	4	4	4	4	4	2	4
JP-5 (MIL-T-5624)	N0602-70	1	1	4	1	1	1	2	4	4	2	2	4	4	4	4	4	2	4

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
JP-6 (MIL-J-25656)	N0602-70	1	1	4	1	1	1	2	4	4	2	2	4	4	4	4	4	2	4
JP-8 (MIL-T-83133) (Jet A)	N0602-70	1	1	4	1	1	1	2	3	4	1	1	4	X	X	4	X	2	4
JP-9 (MIL-F-81912)	V1164-75	3	3	4	1	1	1	2	4	4	4	3	4	X	X	4	X	2	4
JP-9 -11	V1164-75	4	4	4	1	1	1	2	4	4	4	4	4	X	X	4	X	2	4
JPX (MIL-F-25604)	N0674-70	1	1	4	4	1	1	2	2	X	X	X	X	X	X	X	X	X	X
— K —																			
Karl Fischer Reagent		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Kel F Liquids	E0540-80	1	1	1	2	1	1	X	X	1	X	X	1	X	X	X	1	2	1
Kerosene (Similar to RP-1 and JP-1)	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
Keystone #87HX-Grease	N0674-70	1	1	4	1	1	1	X	4	4	1	1	4	4	4	4	4	1	4
— L —																			
Lacquer Solvents	V3819-75	4	4	4	4	1	1	X	4	4	4	4	4	4	4	4	4	4	4
Lacquers	V3819-75	4	4	4	4	1	1	X	4	4	4	4	4	4	4	4	4	4	4
Lactams-Amino Acids	E0540-80	4	4	2	4	1	1	X	2	4	X	X	2	4	4	4	2	4	X
Lactic Acid, Cold	N0674-70	1	1	1	1	1	1	X	1	1	4	X	1	1	1	1	1	1	1
Lactic Acid, Hot	V1164-75	4	4	4	1	1	1	X	4	4	4	X	4	4	4	4	3	2	2
Lactones (Cyclic Esters)	E0540-80	4	4	2	4	1	1	X	4	4	4	4	2	4	4	4	4	4	2
Lard Animal Fat	N0674-70	1	1	2	1	1	1	X	2	4	1	1	2	4	4	4	4	1	2
Lauric Acid	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Lavender Oil	V1164-75	2	2	4	1	1	1	1	4	X	X	X	X	X	X	X	X	X	X
LB 135	N0674-70	1	1	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X
Lead (Molten)	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Lead Acetate	E0540-80	2	2	1	4	1	1	X	2	4	4	4	1	4	1	1	4	4	4
Lead Arsenate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lead Azide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Lead Bromide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lead Carbonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lead Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lead Chromate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lead Dioxide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lead Linoleate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lead Naphthenate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Lead Nitrate	N0674-70	1	1	1	X	1	1	X	1	1	X	X	1	1	1	1	1	1	2
Lead Oxide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lead Sulfamate	C0873-70	2	2	1	1	1	1	X	1	2	4	X	1	2	2	2	1	1	2
Lehigh X1169	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Lehigh X1170	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Light Grease	N0674-70	1	1	4	1	1	1	1	4	X	X	X	X	X	X	X	X	X	X
Ligroin (Petroleum Ether or Benzene)	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	3	1	4
Lime Bleach	N0674-70	1	1	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X
Lime Sulfur	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X

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Lindol, Hydraulic Fluid (Phosphate ester type)	E0540-80	4	4	1	2	1	1	X	4	4	4	4	1	4	4	4	4	3	3
Linoleic Acid	S0604-70	2	2	4	2	1	1	X	2	4	X	X	4	4	4	4	2	X	2
Linseed Oil	N0674-70	1	1	3	1	1	1	X	3	4	1	2	3	4	4	4	2	1	1
Liquid Oxygen (LOX)	Factory	4	4	4	4	3	2	X	4	4	4	4	4	4	4	4	4	4	4
Liquid Petroleum Gas (LPG)	N0674-70	1	1	4	1	1	1	X	2	4	3	1	4	4	4	4	4	1	3
Liquimoly	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4
Lithium Bromide (Brine)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lithium Carbonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lithium Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lithium Citrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lithium Hydroxide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lithium Hypochlorite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lithium Nitrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lithium Nitrite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lithium Perchlorate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lithium Salicylate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lithopone	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Lubricating Oils (Crude & Refined)	V1164-75	2	2	4	1	1	1	1	3	X	X	X	X	X	X	X	X	X	X
Lubricating Oils (Synthetic base)	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Lubricating Oils, Di-ester	V1164-75	2	2	4	1	1	1	X	3	4	2	X	4	4	4	4	X	2	4
Lubricating Oils, petroleum base	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4
Lubricating Oils, SAE 10, 20, 30, 40, 50	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4
Lye Solutions	E0540-80	2	2	1	2	1	1	X	2	2	4	4	1	2	2	1	1	2	2
—M —																			
Magnesium Chloride	N0674-70	1	1	1	1	1	1	X	1	1	X	1	1	1	1	1	1	1	1
Magnesium Hydroxide	E0540-80	2	2	1	1	1	1	X	2	2	4	4	1	2	2	2	1	X	X
Magnesium Salts	N0674-70	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	1
Magnesium Sulfite and Sulfate	N0674-70	1	1	1	1	1	1	X	1	2	4	X	1	2	2	2	1	1	1
Magnesium Trisilicate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Malathion	V1164-75	2	2	4	1	1	1	X	X	4	X	X	4	4	4	4	X	2	4
Maleic Acid	V1164-75	4	4	4	1	1	1	X	4	4	4	X	4	4	4	4	4	X	X
Maleic Anhydride	E0540-80	4	4	2	4	1	1	X	4	4	4	X	2	4	4	4	4	X	X
Maleic Hydrazide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Malic Acid	V1164-75	1	1	2	1	1	1	X	2	2	4	X	4	2	1	3	2	1	2
Mandelic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Manganese Acetate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Manganese Carbonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Manganese Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Manganese Dioxide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2

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Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Manganese Gluconate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Manganese Hypophosphite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Manganese Linoleate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Manganese Naphthenate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Manganese Phosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Manganese Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Manganous Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Manganous Phosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Manganous Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Mannitol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
MCS 312	V1164-75	4	4	4	1	1	1	X	4	4	4	X	4	4	4	4	X	1	1
MCS 352	E1267-80	4	4	1	4	1	1	X	4	4	4	4	2	4	4	4	4	3	3
MCS 463	E1267-80	4	4	1	4	1	1	X	4	4	4	4	2	4	4	4	4	3	3
MDI (Methylene di-p-phenylene isocyanate)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Mercaptan	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Mercaptobenzothiazole (MBT)	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Mercuric Acetate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Mercuric Chloride	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	X	X
Mercuric Cyanide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Mercuric Iodide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Mercuric Nitrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Mercuric Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Mercuric Sulfite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Mercurous Nitrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Mercury	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	X	X
Mercury Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Mercury Fulminate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Mercury Salts	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Mercury Vapors	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	X	X
Mesityl Oxide (Ketone)	E0540-80	4	4	2	4	1	1	X	4	4	4	4	2	4	4	4	4	4	4
Meta-Cresol	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Metaldehyde	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Meta-Nitroaniline	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Meta-Toluidine	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Methacrylic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Methallyl Chloride	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Methane	N0674-70	1	1	4	1	1	1	X	2	4	1	3	4	4	4	4	2	3	4
Methanol	E0540-80	4	4	1	4	1	1	X	1	1	4	4	1	1	1	1	1	1	1
Methoxychlor	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Methoxyethanol (DGMMA)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2

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Methyl Abietate	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Methyl Acetate	E0540-80	4	4	2	4	2	1	X	2	4	4	4	2	4	4	4	4	4	4
Methyl Acetoacetate	E0540-80	4	4	2	4	1	1	X	4	X	4	4	2	X	X	X	4	4	2
Methyl Acetophenone*	V1164-75	X	X	X	1	2	1	X	4	4	4	3	4	4	4	4	4	2	X
Methyl Acrylate	E0540-80	4	4	2	4	1	1	X	2	4	4	4	2	4	4	4	4	4	4
Methyl Alcohol	E0540-80	4	4	1	4	1	1	X	1	1	4	4	1	1	1	1	1	1	1
Methyl Amylketone	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Methyl Anthranilate	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Methyl Benzoate	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	1	4
Methyl Bromide	V1164-75	2	2	4	1	1	1	X	4	4	3	X	4	4	4	4	4	1	X
Methyl Butyl Ketone	E0540-80	4	4	1	4	2	1	X	4	4	4	4	1	4	4	4	4	4	4
Methyl Butyrate Cellosolve	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Methyl Butyrate Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Methyl Carbonate	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Methyl Cellosolve	E0540-80	3	3	2	4	1	1	X	3	4	4	4	2	4	4	4	2	4	4
Methyl Cellulose	N0674-70	2	2	2	4	1	1	X	2	2	4	2	2	2	2	2	2	4	2
Methyl Chloride	V1164-75	4	4	3	1	1	1	X	4	4	4	4	3	4	4	4	4	2	4
Methyl Chloroacetate	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Methyl Chloroform	V1164-75	4	4	4	1	1	1	4	4	X	X	X	X	X	X	X	X	X	X
Methyl Chloroformate	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Methyl Chlorosilanes	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Methyl Cyanide (Acetonitrile)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Methyl Cyclohexanone	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Methyl Dichloride	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Methyldiethanolamine (MDEA)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Methyl Ether	N0674-70	1	1	4	1	2	1	X	3	4	4	X	4	1	1	4	4	1	1
Methyl Ethyl Ketone (MEK)	E0540-80	4	4	1	4	2	1	X	4	4	4	4	1	4	4	4	4	4	4
Methyl Ethyl Ketone Peroxide	S0604-70	4	4	4	4	1	1	X	4	4	4	4	4	4	4	4	4	4	2
Methyl Ethyl Oleate	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Methyl Formate	C0873-70	4	4	2	X	1	1	X	2	4	X	X	2	4	4	4	2	X	X
Methyl Hexyl Ketone (2-Octanone)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Methyl Iodide	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Methyl Isobutyl Ketone (MIBK)	Factory	4	4	3	4	1	1	X	4	4	4	4	3	4	4	4	4	4	4
Methyl Isocyanate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Methyl Isopropyl Ketone	E0540-80	4	4	2	4	1	1	X	4	4	4	4	2	4	4	4	4	4	4
Methyl Isovalerate	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Methyl Lactate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Methyl Mercaptan	E0540-80	X	X	1	X	1	1	X	X	X	X	X	1	X	X	X	X	X	X
Methyl Methacrylate	V3819-75	4	X	4	4	1	1	X	4	4	4	X	4	4	4	4	4	4	4
Methyl Oleate	V1164-75	4	4	2	1	1	1	X	4	4	X	X	2	4	X	4	4	2	X

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Methyl Pentadiene	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Methyl Phenylacetate	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Methylphenyl Carbinol		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Methyl Salicylate	E0540-80	4	4	2	X	1	1	X	4	3	X	X	2	X	X	3	4	X	X
Methyl Tertiary Butyl Ether (MTBE)	V3819-75	3	3	3	3	2	1	2	3	X	X	X	X	X	X	X	X	X	X
Methyl Valerate	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Methyl-2-Pyrrolidone or n-Methyl-2-Pyrrolidone	E0540-80	X	X	2	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Methylacrylic Acid	E0540-80	4	4	2	3	1	1	X	2	4	4	4	2	4	4	4	4	4	4
Methylal	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Methylamine	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Methylamyl Acetate	E0540-80	3	3	1	3	2	1	X	1	1	4	4	1	1	1	1	1	1	2
Methylcyclopentane	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Methylene Bromide	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Methylene Chloride	V1164-75	4	4	4	2	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Methylene Iodide	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Methylglycerol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Methylisobutyl Carbinol	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Methylpyrrolidine	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Methylpyrrolidone	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Methylsulfuric Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
MIL-A-6091	E1267-80	2	2	1	1	1	1	X	1	1	4	4	1	1	1	1	1	1	1
MIL-C-4339	N0304-75	1	1	4	1	1	1	X	4	4	1	1	4	4	4	4	4	1	3
MIL-C-7024	N0602-70	1	1	4	1	1	1	X	2	4	2	1	4	4	4	4	4	1	4
MIL-C-8188	V1164-75	2	2	4	2	1	1	X	4	4	3	4	4	4	4	4	4	2	4
MIL-E-9500	E1267-80	1	1	1	1	1	1	X	1	1	4	4	1	1	1	1	1	1	1
MIL-F-16884	N0304-75	1	1	4	1	1	1	X	3	4	1	3	4	4	4	4	3	1	4
MIL-F-17111	N0304-75	1	1	4	1	1	1	X	2	4	1	3	4	4	4	4	2	2	4
MIL-F-25558 (RJ-1)	N0602-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
MIL-F-25656	N0602-70	1	1	4	1	1	1	X	4	4	2	2	4	4	4	4	4	2	4
MIL-F-5566	E1267-80	2	2	1	1	1	1	X	2	2	4	2	1	2	1	1	1	1	1
MIL-F-81912 (JP-9)	V1164-75	3	3	4	1	1	1	X	4	4	4	3	4	X	X	4	X	2	4
MIL-F-82522 (RJ-4)	N0602-70	2	2	4	1	1	1	X	4	4	1	1	4	1	1	1	X	1	4
MIL-G-10924	N0304-75	1	1	4	1	1	1	X	2	4	2	1	4	4	4	4	2	1	4
MIL-G-15793	N0304-75	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	2	4
MIL-G-21568	E1267-80	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	4
MIL-G-23827		1	X	4	1	1	1	X	3	X	3	3	3	X	X	X	X	1	4
MIL-G-25013	V1164-75	1	1	1	1	1	1	X	2	1	1	3	1	4	4	2	2	1	4
MIL-G-25537	N0304-75	1	1	4	1	1	1	X	2	4	2	1	4	4	4	4	2	1	4
MIL-G-25760	V1164-75	2	2	4	1	1	1	X	2	4	2	2	4	4	4	4	2	2	4
MIL-G-3278	L1120-70	2	2	4	1	1	1	X	4	4	1	2	4	4	4	4	4	2	4

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Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
MIL-G-3545	N0304-75	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
MIL-G-4343	V1164-75	2	2	3	1	1	1	X	2	1	1	1	3	1	1	1	1	1	3
MIL-G-5572	N0602-70	1	1	4	1	1	1	X	4	4	2	2	4	4	4	4	4	1	4
MIL-G-7118	N0304-75	2	2	4	1	1	1	X	2	4	3	3	4	4	4	4	2	1	4
MIL-G-7187	N0304-75	1	1	4	1	1	1	X	4	4	1	1	4	4	4	4	4	1	4
MIL-G-7421	L1120-70	2	2	4	1	1	1	X	2	4	4	2	4	4	4	4	2	2	4
MIL-G-7711	N0304-75	1	1	4	1	1	1	X	4	4	2	1	4	4	4	4	4	1	2
MIL-H-13910	E1267-80	1	1	1	1	1	1	X	1	1	2	4	1	1	1	1	1	2	4
MIL-H-19457	V1164-75	4	4	2	1	1	1	X	4	4	4	4	1	4	4	4	4	4	3
MIL-H-22072	N0304-75	1	X	1	2	1	1	X	2	X	X	4	4	X	X	X	X	2	2
MIL-H-22251	E1267-80	2	2	1	X	X	X	X	2	2	X	X	1	X	X	X	2	X	4
MIL-H-27601	V1164-75	1	1	4	1	1	1	X	2	4	1	3	4	4	4	4	3	2	4
MIL-H-46170 -15°F to +400°F	V1164-75	1	1	4	1	1	1	X	2	4	2	2	4	4	4	4	2	1	4
MIL-H-46170 -20°F to +275°F	N0756-75	1	1	4	1	1	1	X	2	4	2	2	4	4	4	4	2	1	4
MIL-H-46170 -55°F to +275°F	N0756-75	1	1	4	1	1	1	X	2	4	2	2	4	4	4	4	2	1	4
MIL-H-46170 -65°F to +275°F	N0756-75	1	1	4	1	1	1	X	2	4	2	2	4	4	4	4	2	1	4
MIL-H-5606 -65°F to +235°F	N0304-75	1	1	4	1	1	1	X	2	4	2	2	4	4	4	4	2	1	4
MIL-H-5606 -65°F to +275°F	N0756-75	1	1	4	1	1	1	X	2	4	2	2	4	4	4	4	2	1	4
MIL-H-6083	N0304-75	1	1	4	1	1	1	X	1	4	1	1	4	4	4	2	2	1	4
MIL-H-7083	E1267-80	1	1	1	2	1	1	X	2	2	4	4	1	3	3	2	2	1	1
MIL-H-81019	LM158-70	1	X	4	1	1	1	X	2	X	1	2	4	X	X	X	X	1	3
MIL-H-8446 (MLO-8515)	V1164-75	2	2	4	1	1	1	X	1	4	3	4	4	4	4	4	X	1	4
MIL-J-5161	N0602-70	2	2	4	1	1	1	X	4	4	1	2	4	4	4	4	4	1	4
Milk	N0508-75	1	1	1	1	1	1	X	1	1	4	4	1	1	1	1	1	1	1
MIL-L-15016	N0304-75	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	2	4
MIL-L-15017	N0304-75	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	2	4
MIL-L-17331	V1164-75	1	1	4	1	1	1	X	X	4	X	X	4	4	4	4	X	X	4
MIL-L-2104	N0304-75	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	3	1	4
MIL-L-21260	N0304-75	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
MIL-L-23699	V1164-75	2	2	4	1	1	1	X	3	4	3	3	4	4	4	4	3	2	4
MIL-L-25681	V1164-75	2	2	1	1	1	1	X	2	2	2	3	1	2	2	2	2	2	4
MIL-L-3150	N0304-75	1	1	4	1	1	1	X	2	4	2	2	4	4	4	4	2	1	4
MIL-L-6081	N0304-75	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
MIL-L-6082	N0304-75	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	3
MIL-L-6085	V1164-75	2	2	4	1	1	1	X	4	4	2	3	4	4	4	4	4	2	4
MIL-L-6387	V1164-75	2	2	4	1	1	1	X	4	4	2	1	4	4	4	4	4	2	4
MIL-L-7808	V1164-75	2	2	4	1	1	1	X	4	4	2	4	4	4	4	4	4	2	4
MIL-L-7870	N0304-75	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4
MIL-L-9000	N0304-75	1	1	4	1	1	1	X	2	4	1	3	4	4	4	4	2	2	4
MIL-L-9236	V1164-75	2	2	4	1	1	1	X	4	4	2	2	4	4	4	4	4	2	4

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
MIL-O-3503	N0304-75	1	1	4	1	1	1	X	2	4	2	1	4	4	4	4	2	1	4
MIL-P-27402	E1267-80	2	2	1	X	X	X	X	2	2	X	X	1	X	X	X	2	X	4
MIL-PRF-17672	N0304-70	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MIL-PRF-2105	N0304-70	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MIL-PRF-81322	N0304-70	1	1	4	1	1	1	1	2	4	1	1	4	4	4	4	X	1	3
MIL-PRF-87252	N0674-70	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MIL-R-25576 (RP-1)	N0602-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
MIL-S-3136, Type I Fuel	N0602-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
MIL-S-3136, Type II Fuel	N0602-70	2	2	4	1	1	1	X	4	4	3	2	4	4	4	4	4	2	4
MIL-S-3136, Type III Fuel	N0602-70	2	2	4	1	1	1	X	4	4	3	2	4	4	4	4	4	2	4
MIL-S-3136, Type IV Oil High Swell	N0674-70	1	1	4	1	1	1	X	4	4	1	1	4	4	4	4	4	1	2
MIL-S-3136, Type IV Oil Low Swell	N0674-70	1	1	4	1	1	1	X	1	4	1	1	4	4	4	4	1	1	3
MIL-S-3136, Type V Oil Medium Swell	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
MIL-S-81087	E1267-80	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	2	3
MIL-T-5624, JP-4, JP-5	N0602-70	1	1	4	1	1	1	X	4	4	2	2	4	4	4	4	4	2	4
MIL-T-83133	N0602-70	1	1	4	1	1	1	X	3	4	1	1	4	X	X	4	X	2	4
Mineral Oils	N0674-70	1	1	3	1	1	1	X	2	4	1	1	3	4	4	4	2	1	2
Mixed Acids	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
MLO-7277 Hydr.	V1164-75	3	3	4	1	1	1	X	4	4	3	3	4	4	4	4	4	3	4
MLO-7557	V1164-75	3	3	4	1	1	1	X	4	4	3	3	4	4	4	4	4	3	4
MLO-8200 Hydr.	V1164-75	2	2	4	1	1	1	X	1	4	X	1	4	4	4	4	4	2	4
MLO-8515	V1164-75	2	2	4	1	1	1	X	1	4	3	1	4	4	4	4	3	1	4
Mobil DTE 20 Series	N0674-70	1	1	4	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Mobil 254 Lubricant	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Mobil Delvac 1100, 1110, 1120, 1130	N0674-70	1	1	4	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Mobil HF	N0674-70	1	1	4	1	1	1	X	2	X	X	X	X	X	X	X	X	X	X
Mobil Nivac 20, 30	N0674-70	1	1	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X
Mobil SHC 500 Series	V1164-75	3	3	4	1	1	1	X	2	X	1	2	4	X	X	X	2	2	2
Mobil SHC 600 Series	V1164-75	3	3	4	1	1	1	X	2	4	1	1	4	X	X	X	2	2	3
Mobil Therm 600	N0674-70	1	1	4	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Mobil Velocite c	N0674-70	1	1	4	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Mobilgas WA200 ATF	N0674-70	1	1	4	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Mobilgear 600 Series	V1164-75	3	3	3	1	1	1	X	1	4	1	2	3	3	4	4	2	1	1
Mobilgear SHC ISO Series	V1164-75	3	3	3	1	1	1	X	2	4	1	2	3	3	4	4	2	1	1
Mobilgrease HP	V1164-75	2	2	4	1	1	1	X	2	4	1	1	4	X	4	4	3	1	2
Mobilgrease HTS	V1164-75	2	2	4	1	1	1	X	2	4	1	1	4	X	4	4	3	1	2
Mobilgrease SM	V1164-75	2	2	4	1	1	1	X	2	4	1	1	4	X	4	4	3	1	2
Mobilith AW Series	V1164-75	2	2	4	1	1	1	X	2	4	1	1	4	X	4	4	3	1	2
Mobilith SHC Series	V1164-75	2	2	4	1	1	1	X	3	4	1	1	4	X	4	4	3	1	2
Mobiljet 291	VM835-75	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Mobiljet II Lubricant	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Mobilmistlube Series	V1164-75	3	3	3	1	1	1	X	1	4	1	2	3	3	4	4	2	1	1
Mobiloil SAE 20	N0674-70	1	1	4	1	1	1	1	2	4	1	1	4	4	4	4	X	1	X
Mobilux	N0674-70	1	1	4	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Molybdenum Disulfide Grease	N0674-70	1	X	4	1	1	1	1	4	X	X	X	X	X	X	X	X	X	X
Molybdenum Oxide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Molybdenum Trioxide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Molybdic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Monobromobenzene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Monobromotoluene	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Monobutyl Paracresol	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Monochloroacetic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Monochlorobenzene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Monochlorobutene	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Monochlorohydrin	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Monoethanolamine (MEA)	E0540-80	4	4	2	4	2	1	X	4	2	4	4	2	2	2	2	4	4	2
Monoethyl Amine	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Monoisopropylamine	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Monomethyl Aniline	E0540-80	4	X	1	2	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Monomethyl Ether (Dimethyl Ether)	V3819-75	X	X	X	X	2	1	X	X	X	X	X	X	X	X	X	X	X	X
Monomethyl Ether (Methyl Ether)	N0674-70	1	X	4	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Monomethyl Hydrazine	E0540-80	2	2	1	X	1	1	X	2	2	X	X	1	X	X	X	2	X	4
Monomethylamine (MMA)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Monomethylaniline	V1164-75	4	4	2	2	1	1	X	4	4	4	4	2	4	4	4	4	X	X
Mononitrotoluene	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Mononitrotoluene & Dinitrotoluene (40/60 Mixture)	E0540-80	4	4	1	3	2	2	X	4	4	4	4	4	4	4	4	4	3	4
Monovinyl Acetylene	E0540-80	1	1	1	1	1	1	X	2	2	X	X	1	2	2	2	2	X	2
Mopar Brake Fluid	E0667-70	3	3	1	4	1	1	X	2	1	X	X	2	X	X	X	2	4	3
Morpholine	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Motor Oils	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Mustard Gas	E1267-80	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Myristic Acid	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
— N —																			
Naphthalene	V1164-75	4	4	4	1	1	1	X	4	4	X	2	4	4	4	4	4	1	4
Naphthalene Chloride	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Naphthalene Sulfonic Acid	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Naphthalenic Acid	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Naphthalonic Acid	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X

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Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
Hydrogenated Nitrile	-32°C to 149°C (-23°F to 300°F)*	Polyacrylate	-21°C to 177°C (- 5°F to 350°F)*
Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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2 - Fair (usually OK for static seal)
3 - Doubtful (sometimes OK for static seal)
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x - Insufficient Data

	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Naphthenic Acid	V1164-75	2	2	4	1	1	1	X	4	4	X	X	4	4	4	4	4	1	4
Naphthylamine	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Naptha	V1164-75	2	2	4	1	1	1	X	4	4	2	2	4	4	4	4	4	2	4
Natural Gas	N0674-70	1	1	4	1	1	1	X	1	2	2	2	4	2	2	2	1	3	4
Neatsfoot Oil	N0674-70	1	1	2	1	1	1	X	4	4	1	1	2	4	4	4	4	1	2
Neon	B0612-70	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	1
Neville Acid	V1164-75	4	4	2	1	1	1	X	4	4	4	X	2	4	4	4	4	2	4
Nickel Acetate	E0540-80	2	2	1	4	1	1	X	2	4	4	4	1	4	1	1	4	4	4
Nickel Ammonium Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nickel Chloride	N0674-70	1	1	1	1	1	1	X	2	1	3	3	1	1	1	1	1	1	1
Nickel Cyanide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nickel Nitrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nickel Salts	N0674-70	1	1	1	1	1	1	X	2	1	3	3	1	1	1	1	1	1	1
Nickel Sulfate	N0674-70	1	1	1	1	1	1	X	1	2	4	3	1	2	2	2	1	1	1
Nicotinamide (Niacinamide)	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Nicotinamide Hydrochloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nicotine	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Nicotine Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Niter Cake	N0674-70	1	1	1	1	1	1	X	1	1	4	1	1	1	1	1	1	1	1
Nitric Acid, Red Fuming	V3819-75	4	4	4	2	1	1	3	4	X	X	X	X	X	X	X	X	X	X
Nitric Acid, White Fuming	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Nitric Acid (0 - 50%)	V1164-75	4	X	2	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Nitric Acid (50 - 100%)	V3819-75	4	X	4	3	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Nitric Acid 3 Molar to 158°F	E0540-80	4	4	2	3	2	2	X	4	3	4	4	2	X	X	X	2	4	4
Nitric Acid Concentrated Room Temp.	V0834-70	X	X	4	2	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Nitric Acid Concentrated to 158°F	V3819-75	4	4	4	4	3	2	X	4	4	4	4	4	X	X	4	X	4	4
Nitric Oxide	E0540-80	3	X	3	3	X	X	X	3	X	X	4	4	X	X	X	X	X	4
Nitroaniline	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nitrobenzene	E0540-80	4	4	1	2	1	1	X	4	4	4	4	1	4	4	4	4	4	4
Nitrobenzoic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nitrocellulose	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nitrochlorobenzene	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nitrochloroform	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nitrodiethylaniline	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nitrodiphenyl Ether	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Nitroethane	E0540-80	4	4	2	4	1	1	X	2	2	4	4	2	2	2	2	2	4	4
Nitrofluorobenzene	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nitrogen	B0612-70	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	1
Nitrogen Dioxide	E0540-80	3	3	1	4	1	1	X	1	X	4	3	2	X	X	X	X	1	2
Nitrogen Oxides	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Nitrogen Tetroxide (N2O4)	Factory	4	3	4	4	2	2	X	4	4	4	4	3	4	4	4	4	4	4
Nitrogen Trifluoride	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Nitroglycerine	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nitrogylcerol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nitroisopropylbenzene	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nitromethane	E0540-80	4	4	2	4	1	1	X	3	3	4	4	2	2	2	2	2	4	4
Nitrophenol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nitropropane	E0540-80	4	4	2	4	1	1	X	4	4	4	4	2	4	4	4	4	4	4
Nitrosyl Chloride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Nitrosylsulfuric Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Nitrothiophene	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nitrotoluene	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nitrous Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Nitrous Oxide	E0540-80	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X	1
Nonane	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Nonylphenoxy Polyethoxy Ethanol		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Noryl GE Phenolic	N0674-70	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nyvac FR200 Mobil	N0674-70	1	1	1	1	1	1	X	2	4	X	X	4	4	X	4	3	X	X
— O —																			
Octachloro Toluene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Octadecane	N0674-70	1	1	4	1	1	1	X	2	4	2	1	4	4	4	4	2	1	4
Octanal (n-Octanaldehyde)	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Octane or n-Octane	V1164-75	1	1	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Octyl Acetate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Octyl Alcohol	V1164-75	2	2	3	1	1	1	X	2	2	4	4	2	2	2	2	2	2	2
Octyl Chloride	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Octyl Phthalate	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Olefins	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Oleic Acid	V0834-70	3	3	4	2	1	1	X	4	4	4	2	4	4	4	4	4	X	4
Oleum (Fuming Sulfuric Acid)	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	X	4
Oleum Spirits	V1164-75	2	2	4	1	1	1	X	3	4	X	3	4	4	4	4	2	2	4
Oleyl Alcohol	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Olive Oil	N0674-70	1	1	2	1	1	1	X	2	4	1	1	2	4	4	4	2	1	3
Oronite 8200	V1164-75	2	2	4	1	1	1	X	1	4	X	1	4	4	4	4	4	1	4
Oronite 8515	V1164-75	2	2	4	1	1	1	X	1	4	X	1	4	4	4	4	4	1	4
Ortho-Chloro Ethyl Benzene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Ortho-Chloroaniline	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ortho-Chlorophenol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Ortho-Cresol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2

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Ortho-Dichlorobenzene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Ortho-Nitrotoluene	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Orthophos Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
OS 45 Type III (OS45)	V1164-75	2	2	4	1	1	1	X	1	4	X	4	4	4	4	4	2	2	4
OS 45 Type IV (OS45-1)	V1164-75	2	2	4	1	1	1	X	1	4	X	4	4	4	4	4	2	2	4
OS 70	V1164-75	2	2	4	1	1	1	X	1	4	X	4	4	4	4	4	2	2	4
Oxalic Acid	E0540-80	2	2	1	1	1	1	X	2	2	X	X	1	2	2	2	2	1	2
Oxygen, 200°-300°F (Evalute for specific applications)	V1164-75	4	4	4	2	1	1	1	3	4	1	X	1	X	X	4	X	1	1
Oxygen, 300°-400°F (Evalute for specific applications)	S0604-70	4	4	4	2	1	1	X	4	4	4	4	4	4	4	4	4	4	1
Oxygen, Cold (Evalute for specific applications)	C0873-70	2	2	1	1	1	1	X	1	2	2	1	1	2	2	2	1	1	1
Oxygen, Liquid	V3819-75	4	4	4	4	3	2	4	4	X	X	X	X	X	X	X	X	X	X
Ozonated Deionized Water	E0540-80	3	3	1	3	2	2	X	1	1	4	4	1	1	1	1	1	1	2
Ozone	E0540-80	4	2	1	1	1	1	X	2	4	2	1	2	4	4	4	1	1	1
— P —																			
PAG Compressor Oil	N1173-70	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Paint Thinner, Duco	V1164-75	4	4	4	2	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Palmitic Acid	N0674-70	1	1	2	1	1	1	X	2	2	X	1	2	2	2	2	3	1	4
PAO	V1164 -75	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Para-Aminobenzoic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Para-Aminosalicylic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Para-Bromobenzylphenyl Ether	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Para-Chlorophenol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Paracymene	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Para-Dichlorobenzene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Paraffins	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Para-Formaldehyde	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Paraldehyde	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Par-al-Ketone	Factory	4	4	4	4	X	X	X	4	4	4	4	4	4	4	4	4	4	4
Para-Nitroaniline	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Para-Nitrobenzoic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Para-Nitrophenol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Parathion	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Para-Toluene Sulfonic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Paraxylene	V1164-75	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Parker O Lube	N0674-70	1	1	4	1	1	1	X	1	2	1	1	4	4	4	4	1	1	2
Peanut Oil	N0674-70	1	1	3	1	1	1	X	3	4	1	2	3	4	4	4	2	1	1
Pectin (Liquor)	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Pelagonic Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Penicillin (Liquid)	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X

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Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Pentachloroethane	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Pentachlorophenol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Pentaerythritol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Pentaerythritol Tetranitrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Pentafluoroethane (F-125)	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Pentane or n-Pentane	N0674-70	1	1	4	1	1	1	X	1	3	1	4	4	4	4	4	2	3	4
Pentane, 2 Methyl	N0674-70	1	1	4	1	1	1	X	2	4	1	4	4	4	4	4	2	3	4
Pentane, 2-4 dimethyl	N0674-70	1	1	4	1	1	1	X	2	4	1	4	4	4	4	4	2	3	4
Pentane, 3-Methyl	N0674-70	1	1	4	1	1	1	X	2	4	1	4	4	4	4	4	2	3	4
Pentoxone	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Pentyl Pentanoate	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Peracetic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Perchloric Acid - 2N	E0540-80	4	4	1	1	1	1	X	2	4	4	4	2	4	4	4	2	1	2
Perchloroethylene	V1164-75	2	2	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Perfluoropropane	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Perfluorotriethylamine	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Permanganic Acid	FF200-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Persulfuric Acid (Caro's Acid)	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Petrolatum	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Petrolatum Ether	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Petroleum Oil, Above 250°F	V1164-75	4	4	4	2	1	1	X	4	4	4	4	4	4	4	4	4	4	4
Petroleum Oil, Below 250°F	N0674-70	1	1	4	1	1	1	X	2	4	2	2	4	4	4	4	2	2	2
Petroleum Oil, Crude	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Phenol	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Phenol, 70% / 30% H2O	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Phenol, 85% / 15% H2O	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Phenolic Sulfonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Phenolsulfonic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Phenylacetamide	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Phenylacetate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Phenylacetic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Phenylbenzene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Phenylene Diamine	FF500-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Phenylethyl Alcohol	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Phenylethyl Ether	FF200-75	4	4	4	4	1	1	X	4	4	4	4	4	4	4	4	4	4	4
Phenylethyl Malonic Ester*	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Phenylglycerine	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Phenylhydrazine	V1164-75	4	4	2	1	1	1	X	4	2	4	X	4	2	1	1	4	X	X
Phenylhydrazine Hydrochloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Phenylmercuric Acetate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2

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Phorone	Factory	4	4	3	4	1	1	X	4	4	4	4	3	4	4	4	4	4	4
Phosgene	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Phosphine	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Phosphoric Acid 3 Molar to 158°F	E0540-80	1	1	1	1	1	1	X	2	2	3	4	1	X	X	X	1	2	2
Phosphoric Acid Concentrated Room Temp	E0540-80	2	2	1	1	1	1	X	2	1	2	4	1	X	X	X	1	3	3
Phosphoric Acid Concentrated to 158°F	E0540-80	4	4	1	1	1	1	X	3	2	3	4	1	X	X	X	1	3	4
Phosphoric Acid, 20%	E0540-80	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Phosphoric Acid, 45%	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Phosphorus (Molten)	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Phosphorus Oxychloride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Phosphorus Trichloride	E0540-80	4	4	1	1	1	1	X	4	4	X	X	1	X	X	4	4	1	X
Phosphorus Trichloride Acid	E0540-80	4	4	1	1	1	1	1	4	X	X	X	X	X	X	X	X	X	X
Phthalic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Phthalic Anhydride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Pickling Solution	V0834-70	4	4	3	2	1	1	X	4	4	4	4	3	4	4	4	2	4	4
Picric Acid (aq)	C0873-70	1	1	1	1	1	1	X	1	2	X	X	1	2	2	1	1	2	X
Picric Acid Molten	V0834-70	2	2	2	1	1	1	X	2	2	X	X	2	2	2	2	2	2	4
Pine Oil	N0674-70	1	1	4	1	1	1	X	4	4	X	X	4	4	4	4	4	1	4
Pine Tar	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Pinene	V1164-75	2	2	4	1	1	1	X	3	4	4	2	4	4	4	4	4	1	4
Piperazine	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Piperidine	V1164-75	4	4	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	4
Piranha (H2SO4:H2O2)(70:30)	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Plating Solution (Co,Cu,Au,In,Fe,Pb,Ni,Ag,Sn,Zn)	N0674-70	1	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X
Plating Solutions Chrome	V1164-75	4	4	2	1	1	1	X	4	4	4	4	2	4	4	4	4	2	2
Plating Solutions Others	E0540-80	1	1	1	1	1	1	X	4	4	X	X	1	X	X	4	1	X	4
Pneumatic Service	N0674-70	1	1	1	1	1	1	X	1	4	4	1	1	4	4	4	1	4	4
Polyetherpolyol		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Polyethylene Glycol	E0540-80	2	2	1	3	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Polyglycerol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Polyglycol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Polyolester (POE)	N1173-70	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Polyvinyl Acetate Emulsion	E0540-80	X	X	1	X	1	1	X	2	4	X	X	1	X	X	2	2	X	X
Potassium (Molten)	V3819-75	X	X	X	X	4	4	X	X	X	X	X	X	X	X	X	X	X	X
Potassium Acetate	E0540-80	2	2	1	4	1	1	X	2	4	4	4	1	4	1	1	1	4	4
Potassium Acid Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Alum	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Aluminum Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Antimonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Bicarbonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2

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Potassium Bichromate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Bifluoride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Bisulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Bisulfite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Bitartrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Bromide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Carbonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Chlorate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Chloride	N0674-70	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	1
Potassium Chromates	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Citrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Cupro Cyanide	N0674-70	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	1
Potassium Cyanate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Cyanide	N0674-70	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	1
Potassium Dichromate	N0674-70	1	1	1	1	1	1	X	1	1	1	2	1	1	1	1	1	1	1
Potassium Diphosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Ferricyanide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Fluoride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Glucocyanate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Hydroxide 50%	E0540-80	2	2	1	4	1	1	X	2	2	4	4	1	2	2	2	1	3	3
Potassium Hypochlorite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Iodate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Iodide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Metabisulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Metachromate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Metasilicate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Potassium Monochromate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Nitrate	N0674-70	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	1
Potassium Nitrite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Oxalate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Perchlorate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Perfluoro Acetate	V3819-75	X	X	X	X	2	1	X	X	X	X	X	X	X	X	X	X	X	X
Potassium Permanganate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Peroxide	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Potassium Persulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Phosphate (Acid)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Phosphate (Alkaline)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Phosphate (Di/Tri Basic)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Pyrosulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Salts	N0674-70	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	1

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Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
Hydrogenated Nitrile	-32°C to 149°C (-23°F to 300°F)*	Polyacrylate	-21°C to 177°C (- 5°F to 350°F)*
Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Potassium Silicate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Potassium Sodium Tartrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Stannate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Stearate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Sulfate	N0674-70	1	1	1	1	1	1	X	1	2	4	1	1	1	2	2	2	1	1
Potassium Sulfide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Sulfite	N0674-70	1	1	1	1	1	1	X	1	2	4	1	1	1	2	2	2	1	1
Potassium Tartrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Thiocyanate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Thiosulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Potassium Triphosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Prestone Antifreeze	N0674-70	1	1	1	1	1	1	X	1	1	4	4	1	1	1	1	1	1	1
PRL-High Temp. Hydr. Oil	V1164-75	2	2	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	2
Producer Gas	N0674-70	1	1	4	1	1	1	X	2	4	2	1	4	4	4	4	2	2	2
Propane	N0674-70	1	1	4	1	1	1	X	2	4	1	3	4	4	4	4	2	2	4
Propionaldehyde	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Propionic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Propionitrile	N0674-70	1	1	4	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Propyl Acetate	E0540-80	4	4	2	4	1	1	X	4	4	4	4	2	4	4	4	4	4	4
Propyl Acetone or n-Propyl Acetone	E0540-80	4	4	1	4	1	1	X	4	4	4	4	1	4	4	4	4	4	4
Propyl Alcohol	N0674-70	1	1	1	1	1	1	X	1	1	4	4	1	1	1	1	1	1	1
Propyl Nitrate	E0540-80	4	4	2	4	1	1	X	4	4	4	X	2	4	4	4	4	4	4
Propyl Propionate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Propylamine	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Propylbenzene	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Propylene	V1164-75	3	3	4	1	1	1	X	4	4	4	4	4	4	4	4	4	3	4
Propylene Chloride	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Propylene Chlorohydrin	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Propylene Dichloride	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Propylene Glycol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Propylene Imine	V1164-75	X	X	X	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Propylene Oxide	E0540-80	4	4	2	4	1	1	X	4	4	4	4	2	4	4	4	4	4	4
Pydraul 90e	E0540-80	4	4	1	1	1	1	1	4	X	X	X	X	X	X	X	X	X	X
Pydraul, 10E	E0540-80	4	4	1	4	1	1	X	4	4	4	4	1	4	4	4	4	4	1
Pydraul, 115E	V1164-75	4	4	1	1	1	1	X	4	4	4	4	1	4	4	4	4	3	4
Pydraul, 230C, 312C, 540C, A200	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	4	4
Pydraul, 29ELT 30E, 50E, 65E	V1164-75	4	4	1	1	1	1	X	4	4	4	4	1	4	4	4	4	1	1
Pyranol Transformer Oil	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	2	1	4
Pyridine	V1164-75	4	4	2	1	2	1	X	4	4	4	3	4	4	4	4	4	2	X
Pyridine Oil	E0540-80	4	4	2	4	1	1	X	4	4	4	X	2	4	4	4	4	4	4

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Pyridine Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Pyridine Sulfonic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Pyrogallol (Pyrogallic Acid)	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Pyrogard 42, 43, 55	E0540-80	4	4	1	1	1	1	2	4	X	X	X	X	X	X	X	X	X	X
Pyrogard 53, Mobil Phosphate Ester	E0540-80	4	4	1	1	1	1	X	4	4	4	4	1	4	4	4	4	4	4
Pyrogard D, Mobil Water-in-Oil Emulsion	N0674-70	1	1	4	4	1	1	X	2	4	X	1	4	4	4	4	1	2	3
Pyroligneous Acid	E0540-80	4	4	2	4	1	1	X	2	4	4	4	2	4	4	4	2	4	X
Pyrolube	V1164-75	4	4	2	1	1	1	X	4	4	4	4	2	4	4	4	4	2	2
Pyrosulfuric Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Pyrosulfuryl Chloride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Pyrrole	E0540-80	4	4	4	4	1	1	X	4	2	4	X	4	2	2	2	2	4	2
Pyruvic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
— Q —																			
Quinidine	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Quinine	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Quinine Bisulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Quinine Hydrochloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Quinine Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Quinine Tartrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Quinizarin	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Quinoline	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Quinone	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Quintolubric	N0674-70	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Quintolubric 888	V1164-75	1	1	4	1	1	1	1	2	X	X	1	2	X	X	X	X	X	X
— R —																			
Radiation (Gamma, 1.0 E+07 Rads)	E0740-75	3	3	2	4	3	2	X	X	X	X	4	4	X	X	4	X	4	2
Raffinate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Rapeseed Oil	E0540-80	2	2	1	1	1	1	X	2	4	2	2	1	4	4	4	2	1	4
Red Line 100 Oil	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Red Oil (MIL-H-5606)	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Resorcinol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Rhodium	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Riboflavin	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Ricinoleic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
RJ-1 (MIL-F-25558)	N0602-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
RJ-4 (MIL-F-82522)	N0602-70	2	2	4	1	1	1	X	4	4	2	2	4	X	X	4	X	1	4
Rosin	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
RP-1 (MIL-R-25576)	N0602-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4

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—S —																			
Saccharin Solution	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sal Ammoniac	E0540-80	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	2
Salicylic Acid	E0540-80	2	2	1	1	1	1	X	X	2	X	X	1	2	1	1	X	1	X
Santo Safe 300	V1164-75	4	4	3	1	1	1	X	4	4	4	X	3	4	4	4	X	1	1
Sea (Salt) Water	N0674-70	1	1	1	1	1	1	X	2	1	4	2	1	1	1	1	1	1	1
Sebacic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Selenic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Selenous Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sewage	N0674-70	1	1	1	1	1	1	X	2	1	4	4	1	1	1	1	1	1	1
SF 1154 GE Silicone Fluid	E0740-75	2	2	1	1	1	1	X	1	1	1	2	1	X	1	1	1	1	4
SF1147 GE Silicone Fluid	V1164-75	2	2	3	1	1	1	X	X	X	X	X	3	X	X	X	X	X	4
SF96 GE SIlicone Fluid	E0740-75	2	2	1	1	1	1	X	1	1	1	2	1	1	1	1	1	1	4
Shell 3XF Mine Fluid (Fire resist hydr.)	N0674-70	1	1	4	1	1	1	X	2	4	4	4	4	4	4	4	2	1	X
Shell Alvania Grease #2	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	2
Shell Carnea 19 and 29	N0674-70	1	1	4	1	1	1	X	4	4	1	2	4	4	4	4	4	1	X
Shell Diala	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4
Shell Irus 905	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
Shell Lo Hydrax 27 and 29	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4
Shell Macome 72	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4
Shell Tellus #32 Pet. Base	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
Shell Tellus #68	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
Shell Tellus 27 (Petroleum Base)	N0674-70	1	1	4	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Shell Tellus 33	N0674-70	1	1	4	1	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Shell UMF (5% Aromatic)	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
Shellac	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Silane	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Silicate Esters	V1164-75	2	2	4	1	1	1	X	1	4	X	1	4	4	4	4	X	1	4
Silicon Fluoride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Silicon Tetrachloride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Silicon Tetrafluoride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Silicone Greases	E0540-80	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	2	3
Silicone Oils	E0540-80	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	3	3
Silver Bromide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Silver Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Silver Cyanide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Silver Nitrate	E0540-80	2	2	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	1
Silver Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sinclair Opaline CX-EP Lube	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Skelly, Solvent B, C, E	N0674-70	1	1	4	1	1	1	X	4	4	X	X	4	4	4	4	4	1	X
Skydrol 500 B4	E1267-80	4	4	1	4	1	1	X	4	4	4	4	2	4	4	4	4	3	3

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Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
Hydrogenated Nitrile	-32°C to 149°C (-23°F to 300°F)*	Polyacrylate	-21°C to 177°C (- 5°F to 350°F)*
Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Skydrol 7000	E1267-80	4	4	1	2	1	1	1	4	X	X	X	X	X	X	X	X	X	X
Skydrol LD-4	E1267-80	4	4	1	4	1	1	X	4	4	4	4	2	4	4	4	4	3	3
Soap Solutions	E0540-80	1	1	1	1	1	1	X	2	2	4	4	1	1	1	2	1	1	1
Socony Mobile Type A	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	2	4
Socony Vacuum AMV AC781 (Grease)	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	2	4
Socony Vacuum PD959B	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Soda Ash	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Sodium (Molten)	Factory	X	X	X	X	4	4	X	X	X	X	X	X	X	X	X	X	X	X
Sodium Acetate	E0540-80	2	2	1	4	1	1	X	2	4	3	3	1	4	1	1	1	4	4
Sodium Acid Bisulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Acid Fluoride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Acid Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Aluminate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Aluminate Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Anthraquinone Disulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Antimonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Arsenate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Arsenite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Benzoate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Bicarbonate (Baking Soda)	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Sodium Bichromate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Bifluoride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Bisulfate or Bisulfite	N0674-70	1	1	1	1	1	1	X	1	2	4	X	1	2	2	1	1	1	1
Sodium Bisulfide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Bitartrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Borate	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Sodium Bromate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Bromide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Carbonate (Soda Ash)	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Sodium Chlorate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Chloride	N0674-70	1	1	1	1	1	1	X	1	1	X	1	1	1	1	1	1	X	1
Sodium Chlorite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Chloroacetate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Chromate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Citrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Cyanamide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Cyanate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Cyanide	N0674-70	1	1	1	X	1	1	X	1	1	X	X	1	1	1	1	1	X	1
Sodium Diacetate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Diphenyl Sulfonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2

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Sodium Diphosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Disilicate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Ethylate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Ferricyanide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Ferrocyanide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Fluoride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Fluorosilicate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Glutamate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Hydride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Sodium Hydrogen Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Hydrosulfide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Hydrosulfite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Hydroxide, 3 Molar	E0540-80	2	2	1	2	1	1	X	2	2	4	2	1	1	1	1	1	2	1
Sodium Hypochlorite	E0540-80	2	2	1	1	1	1	X	2	2	4	4	1	2	2	2	1	2	2
Sodium Hypophosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Hypophosphite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Hyposulfite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Iodide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Lactate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Metaphosphate	N0674-70	1	1	1	1	1	1	X	2	1	X	X	1	1	1	1	2	1	X
Sodium Metasilicate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Methylate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Monophosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Nitrate	E0540-80	2	2	1	X	1	1	X	2	2	X	X	1	1	1	2	1	X	4
Sodium Oleate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Orthosilicate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Oxalate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Perborate	E0540-80	2	2	1	1	1	1	X	2	2	X	X	1	2	2	2	2	1	2
Sodium Percarbonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Perchlorate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Peroxide	E0540-80	2	2	1	1	1	1	X	2	2	4	4	1	2	2	2	2	1	4
Sodium Persulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Phenolate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Phenoxide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Phosphate (Dibasic)	N0674-70	1	1	1	1	1	1	X	2	1	1	1	1	1	1	1	1	X	4
Sodium Phosphate (Mono)	N0674-70	1	1	1	1	1	1	X	2	1	1	1	1	1	1	1	1	X	4
Sodium Phosphate (Tribasic)	N0674-70	1	1	1	1	1	1	X	2	1	1	1	1	1	1	1	1	X	1
Sodium Plumbite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Pyrophosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Resinate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2

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Sodium Salicylate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Salts	N0674-70	1	1	1	1	1	1	X	2	1	1	1	1	1	1	1	1	1	1
Sodium Sesquisilicate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Sodium Silicate	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	X	X
Sodium Silicofluoride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Sodium Stannate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Sulfate	N0674-70	1	1	1	1	1	1	X	1	2	4	1	1	2	2	2	1	1	1
Sodium Sulfide and Sulfite	N0674-70	1	1	1	1	1	1	X	1	2	4	1	1	2	2	2	1	1	1
Sodium Sulfocyanide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Tartrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Tetraborate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Tetraphosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Tetrasulfide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Thioarsenate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Thiocyanate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Thiosulfate	E0540-80	2	2	1	1	1	1	X	1	2	4	1	1	2	2	2	1	1	1
Sodium Trichloroacetate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sodium Triphosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Solvesso 100, 150	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Sorbitol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sour Crude Oil	V1238-95	3	3	4	1	1	1	X	4	4	4	4	4	4	4	4	X	4	4
Sour Natural Gas	V1238-95	3	3	4	1	1	1	X	4	4	4	4	4	4	4	4	X	4	4
Sovasol No. 1, 2, and 3	N0674-70	1	1	4	1	1	1	X	2	4	2	2	4	4	4	4	2	1	4
Sovasol No. 73 and 74	V1164-75	2	2	4	1	1	1	X	2	4	2	2	4	4	4	4	2	1	4
Soybean Oil	N0674-70	1	1	3	1	1	1	X	3	4	1	X	3	4	4	4	3	1	1
Spry	N0674-70	1	1	2	1	1	1	X	2	4	1	1	2	4	4	4	4	1	1
SR-10 Fuel	N0674-70	1	1	4	1	1	1	X	4	4	2	2	4	4	4	4	4	1	4
SR-6 Fuel	V1164-75	2	2	4	1	1	1	X	4	4	2	2	4	4	4	4	4	1	4
Standard Oil Mobilube GX90-EP Lube	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Stannic Ammonium Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Stannic Chloride	N0674-70	1	1	1	1	1	1	X	4	1	X	X	1	1	1	1	4	1	2
Stannic Chloride, 50%	N0674-70	1	1	1	1	1	1	X	4	1	X	X	1	1	1	1	4	1	2
Stannic Tetrachloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Stannous Bisulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Stannous Bromide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Stannous Chloride (15%)	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	2
Stannous Fluoride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Stannous Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Stauffer 7700	V1164-75	2	2	4	1	1	1	X	4	4	2	X	4	4	4	4	4	2	4
Steam Below 400°F	E0692-75	4	4	1	4	1	1	X	4	4	4	4	2	4	4	4	4	4	3

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Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
Hydrogenated Nitrile	-32°C to 149°C (-23°F to 300°F)*	Polyacrylate	-21°C to 177°C (- 5°F to 350°F)*
Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Steam, 400° - 500°F	E0962-90	4	4	3	4	1	1	X	4	4	4	4	4	4	4	4	4	4	4
Steam, Above 500°F	FF200-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Stearic Acid	N0674-70	2	2	2	X	1	1	X	2	2	X	X	2	2	2	2	2	X	2
Stoddard Solvent	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
Strontium Acetate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Strontium Carbonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Strontium Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Strontium Hydroxide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Strontium Nitrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Styrene (Monomer)	V1164-75	4	4	4	2	1	1	X	4	4	4	X	4	4	4	4	4	3	4
Succinic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sucrose Solutions	N0674-70	1	1	1	1	1	1	X	2	1	4	4	1	1	1	1	2	1	1
Sulfamic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sulfanilic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sulfanilic Chloride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Sulfanilimide	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Sulfite Liquors	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sulfolane	E0540-80	2	2	1	2	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Sulfonated Oils	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Sulfonic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sulfonyl Choride	E0540-80	3	3	1	3	2	2	X	1	1	4	4	1	1	1	1	1	1	2
Sulfur	E0540-80	4	4	1	1	1	1	X	1	4	4	X	1	4	4	4	X	1	X
Sulfur (Molten)	V1164-75	4	4	3	1	1	1	X	3	4	4	4	3	4	4	4	4	3	3
Sulfur Chloride	V1164-75	4	4	4	1	1	1	X	4	4	4	X	4	4	4	4	4	1	3
Sulfur Dioxide, Dry	E0540-80	4	4	1	4	1	1	X	4	2	4	X	2	2	2	2	4	2	2
Sulfur Dioxide, Liquidified under pressure	E0540-80	4	4	1	4	1	1	X	4	4	4	X	2	4	4	4	4	2	2
Sulfur Dioxide, Wet	E0540-80	4	4	1	4	1	1	X	2	4	4	X	1	4	4	4	3	2	2
Sulfur Hexafluoride	E0540-80	2	2	1	3	2	2	3	1	X	X	X	X	X	X	X	X	X	X
Sulfur Liquors	V0834-70	2	2	2	1	1	1	X	2	2	4	X	2	2	2	2	2	2	4
Sulfur Monochloride	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Sulfur Tetrafluoride	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Sulfur Trioxide Dry	V1164-75	4	4	2	1	1	1	X	4	3	4	X	2	2	2	2	4	2	2
Sulfuric Acid (20% Oleum)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sulfuric Acid, 3 Molar to 158°F	E0540-80	2	2	1	1	1	1	X	2	3	2	4	1	X	X	X	1	1	1
Sulfuric Acid, Concentrated Room Temp	V1164-75	X	X	3	1	1	1	X	X	X	X	3	X	X	X	X	X	X	X
Sulfuric Acid, Concentrated to 158°F	V1164-75	4	X	4	1	1	1	X	4	4	4	4	4	X	X	X	X	4	4
Sulfuric Chlorohydrin (Chlorosulfonic Acid)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Sulfurous Acid	V1164-75	2	2	2	1	1	1	X	2	2	4	3	2	2	2	2	1	X	4
Sunoco #3661	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Sunoco All purpose grease	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Sunoco SAE 10	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Sunsafe (Fire resist. hydr. fluid)	N0674-70	1	1	4	1	1	1	X	2	4	4	4	4	4	4	4	2	1	X
Super Shell Gas	N1500-75	1	1	4	1	1	1	X	2	4	2	2	4	4	4	4	4	2	4
Surfuryl Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Swan Finch EP Lube	N0674-70	1	1	4	1	1	1	X	4	4	1	1	4	4	4	4	4	1	4
Swan Finch Hypoid-90	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
— T —																			
Tallow	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Tannic Acid (10%)	N0674-70	1	1	1	1	1	1	X	1	2	4	X	1	1	1	1	1	1	2
Tar, bituminous	V1164-75	2	2	4	1	1	1	X	3	4	4	X	4	4	2	3	4	1	2
Tartaric Acid	N0674-70	1	1	2	1	1	1	X	2	4	X	1	2	2	1	3	1	1	1
Tellone II	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Terephthalic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Terpineol	V1164-75	2	2	3	1	1	1	X	4	4	X	2	3	4	4	4	4	1	X
Terpinyl Acetate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Tertiary Amyl Methyl Ether (TAME)	V3819-75	X	X	X	X	2	1	X	X	X	X	X	X	X	X	X	X	X	X
Tertiary Butyl Catechol or p-tert-butylcatechol	V1164-75	4	4	2	1	1	1	X	2	2	4	4	2	2	4	4	2	1	X
Tertiary Butyl Mercaptan	V1164-75	4	4	4	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Tetrabromoethane	V1164-75	4	4	4	1	1	1	X	4	4	4	X	4	4	4	4	4	2	4
Tetrabromomethane	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Tetrabutyl Titanate	E0540-80	2	2	1	1	1	1	X	2	2	X	X	2	2	2	2	4	4	4
Tetrachloroethylene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Tetrachoroethane	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	X
Tetraethyl Lead	V1164-75	2	2	4	1	1	1	X	2	4	X	X	4	4	4	4	4	2	X
Tetraethyl Lead "Blend"	V1164-75	2	2	4	1	1	1	X	4	4	X	X	4	4	4	4	4	2	X
Tetraethyl Orthosilicate (TEOS)	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Tetrahydrofuran	FF500-75	4	4	2	4	1	1	X	4	4	4	3	2	4	4	4	4	4	4
Tetrahydrothiophen	V1164-75	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Tetralin	V1164-75	4	4	4	1	1	1	X	4	4	X	X	4	4	4	4	4	1	4
Tetramethyl Ammonium Hydroxide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	X	2
Tetramethylcyclotetrasiloxane (TMCTS)	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Tetramethyldihydropyridine	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Tetraphosphoglucosate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Tetraphosphoric Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Tetrasodium Pyrophosphate	E0540-80	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Texaco 3450 Gear Oil	N0674-70	1	1	4	1	1	1	X	4	4	1	1	4	4	4	4	4	1	4
Texaco Capella A and AA	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4

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Texaco Meropa 220 (No Lead)	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	1	4
Texaco Regal B	N0674-70	1	1	4	1	1	1	X	4	4	1	1	4	4	4	4	4	1	4
Texaco Uni-Temp Grease	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	2
Texamatic "A" 1581 Fluid	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	2	4
Texamatic "A" 3401 Fluid	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	2	4
Texamatic "A" 3525 Fluid	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	2	4
Texamatic "A" 3528 Fluid	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	2	4
Texamatic "A" Transmission Oil	N0674-70	1	1	4	1	1	1	X	2	4	1	2	4	4	4	4	4	2	4
Texas 1500 Oil	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	2
Therminol 44	V1164-75	4	4	4	1	1	1	X	4	X	4	X	4	X	X	X	X	X	4
Therminol 55	V1164-75	2	2	4	1	1	1	X	4	X	2	X	4	X	X	X	X	X	4
Therminol 66	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Therminol FR	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Therminol VP-1, 60, 65	V1164-75	4	4	4	1	1	1	X	4	X	4	X	4	X	X	X	X	X	2
Thio Acid Chloride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Thioamyl Alcohol	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Thiodiacetic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Thioethanol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Thioglycolic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Thiokol TP-90B	E0540-80	4	4	1	1	1	1	X	2	4	X	X	1	X	X	X	2	2	X
Thiokol TP-95	E0540-80	4	4	1	1	1	1	X	2	4	X	X	1	X	X	X	2	2	X
Thionyl Chloride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Thiophene (Thiofuran)	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Thiophosphoryl Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Thiourea	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Thorium Nitrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Tidewater Multigear, 140 EP Lube	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Tidewater Oil-Beedol	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	2
Tin Ammonium Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Tin Chloride	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Tin Tetrachloride	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Titanic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Titanium Chloride	V1164-75	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Titanium Dioxide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Titanium Sulfate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Titanium Tetrachloride	V1164-75	2	2	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Toluene	V1164-75	4	4	4	1	2	1	X	4	4	4	4	4	4	4	4	4	2	4
Toluene Bisodium Sulfite	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Toluene Diisocyanate (TDI)	E0540-80	4	4	2	4	1	1	X	4	4	4	X	2	4	4	4	4	4	4
Toluene Sulfonyl Chloride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X

Approximate Service Temperature Ranges for Commonly Used Basic Polymer Types*

Nitrile (General Service)	-34°C to 121°C (-30°F to 250°F)*	AFLAS	-9°C to 232°C (15°F to 450°F)*
Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
Hydrogenated Nitrile	-32°C to 149°C (-23°F to 300°F)*	Polyacrylate	-21°C to 177°C (- 5°F to 350°F)*
Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Toluenesulfonic Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Toluidine	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Toluol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Toluquinone	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Tolylaldehyde	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Toothpaste	E3609-70	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1
Transformer Oil	N0674-70	1	1	4	1	1	1	X	2	4	2	1	4	4	4	4	4	1	2
Transmission Fluid Type A	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Triacetin	E0540-80	2	2	1	4	1	1	X	2	3	4	4	1	2	2	2	2	4	X
Triaryl Phosphate	E0540-80	4	4	1	1	1	1	X	4	4	4	4	1	4	4	4	4	2	3
Tribromomethylbenzene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Tributoxyethyl Phosphate	E0540-80	4	4	1	1	1	1	X	4	2	4	4	1	2	4	2	4	2	X
Tributyl Citrate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Tributyl Mercaptan	V1164-75	4	4	4	1	1	1	X	4	4	4	X	4	4	4	4	4	3	4
Tributyl Phosphate	E0540-80	4	4	1	4	1	1	X	4	4	4	4	2	4	2	2	4	4	4
Tributylamine	FF500-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Trichloroacetic Acid	E0540-80	2	2	2	3	1	1	X	4	2	4	4	2	2	2	2	4	4	X
Trichloroacetyl Chloride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Trichlorobenzene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Trichloroethane	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Trichloroethanolamine	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Trichloroethylene	V1164-75	3	3	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Trichloromethane	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Trichloronitromethane (Chloropicrin)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Trichlorophenylsilane	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Trichloropropane	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Trichlorosilane	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Tricresyl Phosphate	E0540-80	4	4	1	2	1	1	X	3	2	4	4	1	4	4	4	4	2	3
Triethanol Amine	E0540-80	3	3	2	4	1	1	X	2	2	4	4	2	2	2	2	2	4	X
Triethyl Phosphate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Triethylaluminum	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Triethylborane	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Triethylene Glycol	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Triethylenetetramine	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Trifluoroacetic Acid	E0540-80	3	3	1	3	2	2	X	1	1	4	4	1	1	1	1	1	1	2
Trifluoroethane (R-23)	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Trifluoromethane	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	2	4
Trifluorovinylchloride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Triisopropylbenzylchloride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Trimethylamine (TMA)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2

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	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
Trimethylbenzene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Trimethylborate (TMB)	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Trimethylpentane	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Trinitrololuene (TNT)	V1164-75	4	4	4	2	1	1	X	2	4	4	X	4	4	4	4	2	2	X
Trioctyl Phosphate	E0540-80	4	4	1	2	1	1	X	4	4	4	4	1	4	4	4	4	2	3
Triphenylphosphite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Tripoly Phosphate	E0540-80	4	4	1	2	1	1	X	3	4	4	4	1	4	4	4	4	1	3
Tripotassium Phosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Trisodium Phosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Tritium	Factory	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Tung Oil (China Wood Oil)	N0674-70	1	1	4	1	1	1	X	2	4	X	3	3	4	4	4	3	2	4
Tungsten Hexafluoride	V3819-75	X	X	X	X	2	2	X	X	X	X	X	X	X	X	X	X	X	X
Tungstic Acid	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Turbine Oil	N0674-70	1	1	4	1	1	1	X	4	4	1	1	4	4	4	4	4	1	4
Turbine Oil #15 (MIL-L-7808A)	V1164-75	2	2	4	1	1	1	X	4	4	2	4	4	4	4	4	4	2	4
Turbo Oil #35	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
Turpentine	N0674-70	1	1	4	1	1	1	X	4	4	2	4	4	4	4	4	4	2	4
Type I Fuel (MIL-S-3136)(ASTM Ref. Fuel A)	N0602-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Type II Fuel MIL-S-3136	N0602-70	2	2	4	1	1	1	X	4	4	3	2	4	4	4	4	4	2	4
Type III Fuel MIL-S-3136(ASTM Ref. Fuel B)	N0602-70	2	2	4	1	1	1	X	4	4	3	2	4	4	4	4	4	2	4
— U —																			
Ucon Hydrolube J-4	N0674-70	1	1	1	1	1	1	X	2	1	4	4	1	2	X	X	X	2	1
Ucon Lubricant 50-HB-100	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Ucon Lubricant 50-HB-260	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Ucon Lubricant 50-HB-5100	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Ucon Lubricant 50-HB55	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Ucon Lubricant 50-HB-660	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Ucon Lubricant LB-1145	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Ucon Lubricant LB-135	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Ucon Lubricant LB-285	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Ucon Lubricant LB-300X	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Ucon Lubricant LB-625	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Ucon Lubricant LB-65	N0674-70	1	1	1	1	1	1	X	1	2	X	X	1	2	2	2	2	1	1
Ucon Oil 50-HB-280x	E0540-80	2	2	1	3	1	1	1	2	X	X	X	X	X	X	X	X	X	X
Ucon Oil Heat Transfer Fluid 500 (Polyalkalene Glycol)	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Ucon Oil LB-385	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1

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Ucon Oil LB-400X	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	1
Undecylenic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Undecylic Acid	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Univis 40 (Hydr. Fluid)	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	4
Univolt #35 (Mineral Oil)	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
Unsymmetrical Dimethyl Hydrazine (UDMH)	E0540-80	2	2	1	4	1	1	X	2	2	X	X	1	1	1	1	1	4	4
UPDI(Ultrapure Deionized Water)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Uranium Hexachloride	V1164-75	X	X	X	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Uranium Hexafluoride	Factory	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Uranium Sulfate	Factory	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Uric Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	3	2
— V —																			
Valeraldehyde	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Valeric Acid	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Vanadium Oxide	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Vanadium Pentoxide	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	2	1	2
Varnish	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	4
Vegetable Oil	N0674-70	1	1	3	1	1	1	X	3	4	1	X	3	4	4	4	X	1	1
Versilube F44, F55	N0674-70	1	1	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X
Versilube F-50	E0540-80	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	3
Vinegar	E0540-80	2	2	2	3	1	1	X	2	2	4	4	2	2	2	2	X	3	3
Vinyl Acetate	E0540-80	2	2	1	3	2	1	1	2	X	X	X	X	X	X	X	X	X	X
Vinyl Benzene	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Vinyl Benzoate	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Vinyl Chloride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Vinyl Fluoride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Vinylidene Chloride	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Vinylpyridine	V1164-75	2	2	4	1	1	1	X	4	4	4	3	4	4	4	4	4	2	X
Vitriol (White)	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
VV-H-910	E0540-80	3	3	1	1	1	1	X	2	1	2	4	2	2	2	2	2	2	2
V V-L-825	C0873-70	1	X	4	X	1	1	X	1	X	1	2	4	X	X	X	X	1	3
— W —																			
Wagner 21B Brake Fluid	E0667-70	3	3	1	4	1	1	X	2	1	X	X	2	X	X	2	2	4	3
Water	E0540-80	1	2	1	2	1	1	X	2	1	4	4	1	1	1	1	1	1	1
Wemco C	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
Whiskey and Wines	E3609-70	1	1	1	1	1	1	X	1	1	4	4	1	1	1	1	1	1	1
White Liquor	N0674-70	1	1	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X

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Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

NOTE: *These temperature ranges will apply to the majority of media for which the material is potentially recommended. With some media however, the service temperature range may be significantly different. ALWAYS TEST UNDER ACTUAL SERVICE CONDITIONS.

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COMPOUND COMPATIBILITY RATING
1 - Satisfactory
2 - Fair (usually OK for static seal)
3 - Doubtful (sometimes OK for static seal)
4 - Unsatisfactory
x - Insufficient Data

	Recommended	Nitrile NBR	Hydrogenated Nitrile HNBR	Ethylene Propylene EPDM	Fluorocarbon FKM	Hifluor FKM	Perfluoroelastomer FFKM	Aflas (TFE/Propylene) FEPM	Neoprene/Chloroprene CR	Styrene-Butadiene SBR	Polyacrylate ACM	Polyurethane AU, EU	Butyl IIR	Butadiene BR	Isoprene IR	Natural Rubber NR	Hypalon CSM	Fluorosilicone FVMQ	Silicone MQ, VMQ, PVMQ
White Oil	N0674-70	1	1	4	1	1	1	X	2	4	1	1	4	4	4	4	4	1	4
White Pine Oil	V1164-75	2	2	4	1	1	1	X	4	4	X	X	4	4	4	4	4	1	4
Wolmar Salt	N0674-70	1	1	1	1	1	1	X	2	1	2	1	1	1	1	1	1	1	1
Wood Alcohol	N0674-70	1	1	1	4	1	1	X	1	1	4	4	1	1	1	1	1	1	1
Wood Oil	N0674-70	1	1	4	1	1	1	X	2	4	1	3	3	4	4	4	3	2	4
— X —																			
Xenon	N0674-70	1	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1	1	1
Xylene	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	1	4
Xylidenes-Mixed-Aromatic Amines	E0540-80	3	3	1	4	1	1	X	4	4	4	4	4	4	4	4	4	4	4
Xylol	V1164-75	4	4	4	1	1	1	X	4	4	4	4	4	4	4	4	4	1	4
— Z —																			
Zeolites	N0674-70	1	1	1	1	1	1	X	1	1	X	X	1	1	1	1	1	1	X
Zinc Acetate	E0540-80	2	2	1	4	1	1	X	2	4	4	4	1	4	1	1	4	4	4
Zinc Ammonium Chloride	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Zinc Bromide Completion Fluid	V1164-75	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Zinc Chloride	N0674-70	1	1	1	1	1	1	X	1	1	4	X	1	1	1	1	1	1	X
Zinc Chromate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Zinc Cyanide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Zinc Diethyldithiocarbamate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Zinc Dihydrogen Phosphate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Zinc Fluorosilicate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Zinc Hydrosulfite	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Zinc Naphthenate	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Zinc Nitrate	N0674-70	1	1	1	1	1	1	X	X	1	4	X	1	1	1	1	1	1	X
Zinc Oxide	N0674-70	1	1	1	1	1	1	X	X	1	4	X	1	1	1	1	1	1	X
Zinc Phenolsulfonate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Zinc Phosphate	N0674-70	1	1	1	1	1	1	X	1	1	4	1	1	1	1	1	1	1	1
Zinc Salts	N0674-70	1	1	1	1	1	1	X	1	1	4	1	1	1	1	1	1	1	1
Zinc Silicofluoride	V3819-75	X	X	X	X	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Zinc Stearate	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Zinc Sulfate	N0674-70	1	1	1	1	1	1	X	1	2	4	4	1	2	2	2	1	1	1
Zinc Sulfide	E0540-80	3	3	1	3	1	1	X	1	1	4	4	1	1	1	1	1	1	2
Zirconium Nitrate	N0674-70	1	1	1	1	1	1	X	1	2	4	4	1	2	2	2	1	1	1

Approximate Service Temperature Ranges for Commonly Used Basic Polymer Types*

Nitrile (General Service)	-34°C to 121°C (-30°F to 250°F)*	AFLAS	-9°C to 232°C (15°F to 450°F)*
Nitrile (Low Temperature)	-55°C to 107°C (-65°F to 225°F)*	Neoprene	-51°C to 107°C (-60°F to 225°F)*
Hydrogenated Nitrile	-32°C to 149°C (-23°F to 300°F)*	Polyacrylate	-21°C to 177°C (- 5°F to 350°F)*
Ethylene Propylene	-57°C to 121°C (-70°F to 250°F)*	Polyurethane	-40°C to 82°C (-40°F to 180°F)*
Fluorocarbon	-26°C to 205°C (-15°F to 400°F)*	Butyl	-59°C to 120°C (-75°F to 250°F)*
Hifluor	-26°C to 205°C (-15°F to 400°F)*	Fluorosilicone	-73°C to 177°C (-100°F to 350°F)*
Perfluoroelastomer (Parofluor)	-26°C to 320°C (-15°F to 608°F)*	Silicone	-115°C to 232°C (-175°F to 450°F)*

NOTE: *These temperature ranges will apply to the majority of media for which the material is potentially recommended. With some media however, the service temperature range may be significantly different. ALWAYS TEST UNDER ACTUAL SERVICE CONDITIONS.

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Military Rubber Specifications

Note: In keeping with the Federal Acquisition Streamlining Act (FASA), most of these specifications are in the process of being revised to AMS specifications. For the most current information, contact the O-Ring Division.

Rubber Specification Class	Grade	Parker Compound	Temperature Range[2]	Description
ZZ-R-765E				Rubber, Silicone
1a. 1b. 2a. 2b.	40	S1198-40	- 103 to 437°F (-75 to 225°C)	Low and High Temperature Resistant, Low Compression Set
1a. 1b. 2a. 2b.	50	S0899-50	- 103 to 437°F (-75 to 225°C)	Low and High Temperature Resistant, Low Compression Set
1a. 1b.	70	S0383-70	- 103 to 437°F (-75 to 225°C)	Low Temperature Resistant, Low Compression Set
2a. 2b.	80	S0614-80	- 80 to 437°F (-62 to 225°C)	High Temperature Resistant, Low Compression Set
2a. 2b.	70	S1224-70	- 80 to 437°F (-62 to 225°C)	High Temperature Resistant, Low Compression Set
2b.	60	S0613-60	- 80 to 437°F (-62 to 225°C)	High Temperature Resistant, Low Compression Set
Note: A-A-59588 supercedes ZZR-R-765E				
MIL-G-1149C- Gasket Materials, Synthetic Rubber, 50 and 65 Durometer Hardness				
Type I Class 1		C0267-50	(-20 to 212°F) (-29 to 100°C)[2]	
MIL-R-3533B - Rubber, Synthetic; Sheet, Strip and Molded				
Type I Grade B		N0602-70	(-20 to 158°F) (-29 to 70°C)[2]	
MIL-P-5315B - Packing, O-ring, Hydrocarbon Fuel Resistant (Jet Fuels)				
		N0602-70	(-65 to 160°F) (-54 to 71°C)	(Military O-ring series MS29512 and MS29513)
Note: AMS-P-5315 supercedes MIL-P-53158				
MIL-P-5510C - Gasket, Straight Thread Tube Fitting Boss (MIL-H-5606 Petroleum Based Hydraulic Fluid,				
		N0507-90		(-45 to 160°F) (-43 to 71°C)[2] (Military O-ring series MS28778)
Note: AMS-P-5510 supercedes MIL-P-5510				
MIL-DTL-7362D - Rubber, Sheet, Molded and Extruded Shapes, Synthetic Oil Resistant (AMS3021)				
Types I, II		47-071	Synthetic, Di-Ester Base Lubricant (-65 to 275°F) (-54 to 135°C)[2]	(Military O-ring series MS29561 and WAS617)
Note: AMS-R-7362 supercedes MIL-R-7362D				
MIL-G-21569B - Gaskets, Cylinder Liner Seal, Synthetic				
Class I		N0674-70[1]		(Room temperature to 194°F) (RT to 90°C)
Class II		S0604-70		
MIL-DTL-25732C - Packing, Preformed, Petroleum Hydraulic Fluid Resistant (MIL-H-5606)				
		N0304-75		Petroleum Base Hydraulic Fluid (-65 to 275°F) (-54 to 135°C)[2] (Military O-ring series MS28775)
MIL-R-25988 - Rubber Fluorosilicone Elastomer, Oil and Fuel Resistant (MIL-H-5606 Petroleum Base)				
Type 1, Class 1,	Grade 60/3	LM158-60		Hydraulic Fluid, Fuel, Air (-90 to 350°F)(-68 to 176°C)[2]
Type 1, Class 1,	Grade 70/1	LM159-70		
Type 1, Class 1,	Grade 80/4	LM160-80		
Type 1, Class 3,	Grade 75/2	L1077-75[1]		
Note: AMS-R-25988 supercedes MIL-R-35988				
MIL-P-82744 - Packing, Preformed, Otto Fuel Compatible				
		E0515-80		(-65 to 250°F) (-54 to 121°C)
MIL-R-83248C, Type I - Rubber, Fluorocarbon Elastomer, High Temperature Fluid and Compression				
Class I		V0747-75, V1164-75, V1226-75		Set Resistant (-15 to 400°F) (-5 to 105°C)
Class 2		V0709-90		
Note: AMS-R-83248 supercedes MIL-R-83248C				
MIL-R-83485				
	Grade 80	VM835-75		Rubber, fluorocarbon Elastomer, Improved performance @ low Temp (-40 to 400°C)
Note: AMS-R-83485 supercedes MIL-R-83485				
MIL-P-83461B - Packings, Preformed, Petroleum Hydraulic Fluid Resistant, Improved Performance				
		N0756-75		(-65 to 275°F) (-54 to 135°C)[2]
Note: AMS-P-5315 supercedes MIL-P-53158				

Notes: When ordering parts made with a military, AMS or NAS specification material, see the section on ordering.
(1) Extra charges may apply for testing and documentation.
(2) These temperatures are limits for particular tests required by the specifications, but they do not necessarily represent operating temperature limits.
(3) Inactive for new design, refer to MIL-P-25732. See discussion on "Temperature" in the Basic O-Ring Elastomers Section (II).

Table 8-3: Military Rubber Specifications

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AMS(1) and NAS(2) Rubber Specification Descriptions

Rubber Specification	Parker Compound	Description	
		Durometer	Title
AMS3201	N0545-40	35-45	Dry Heat Resistance
AMS3205	N0299-50	45-55	Low Temperature Resistance
AMS3208	C0267-50	45-55	Weather Resistant, Chloroprene Type
AMS3209	C1124-70	65-75	Weather Resistant, Chloroprene Type
AMS3212	N0525-60	55-65	Aromatic Fuel Resistant
AMS 3238	B0318-70	65-75	Phosphate-Ester Resistant, Butyl Type
AMS3301	S0469-40	35-45	Silicone, General Purpose
AMS3302	S0595-50	45-55	Silicone, General Purpose
AMS3303	S0613-60	55-65	Silicone, General Purpose
AMS3304	S1224-70	65-75	Silicone, General Purpose
AMS3305	S0614-80	75-85	Silicone, General Purpose
AMS3325	LM158-60	55-65	Fluorosilicone Rubber, Fuel and Oil Resistant
AMS3337	S0383-70	65-75	Silicone, Extreme Low Temperature Resistant
AMS3345	S0899-50	45-55	Silicone Rubber
AMS3357	S1224-70	65-75	Silicone Rubber, Lubricating Oil, Compression Set Resistant
AMS7257	FF200-75	70-80	Sealing Rings, Perfluorocarbon, High Temperature Resistant
AMS7259	V0709-90	85-95	High Temp, Fluid Resistant, Very Low Compression Set FKM
AMS7267	S0355-75	70-80	Silicone, Heat Resistant, Low Compression Set
AMS7271	N0506-65	60-70	Fuel and Low Temperature Resistant
AMS7272	N0287-70	65-75	Synthetic Lubricant Resistant
AMS7276	V1164-75	70-80	High Temp. Fluid Resistant, Very Low Compression Set FKM
NAS1613 Rev 2	E0515	80-75	Packing, O-ring, Phosphate Ester Resistant
NAS1613 Rev 5	E1267-80	75-85	Packing, O-ring, Phosphate Ester Resistant
AMS-P-5315	N0602-70	65-75	Packing O-ring, Hydrocarbon Fuel Resistant
AMS-P-5510	N0507-90	85-95	Gasket, Straight Thread Tube Fitting Boss
AMS-R-7362	47-071	65-75	Rubber, Sheet, Molded and Extruded Shapes, Synthetic Oil Resistant
AMS-P-25732	N0304-75	70-80	Packing, Preformed, Petroleum Hydraulic Fluid Resistant, Limited Performance
AMS-R-25988	LM158-60, LM159-70, LM160-80, L1077-75	55-85	Rubber, Fluorosilicone Elastomer, Oil and Fuel Resistant
AMS-R-83248	V1164-75, V1226-75, V0709-90	70-95	Rubber, Fluorocarbon Elastomer, High Temperature Fluid and Compression Set Resistant
AMS-P-83461	N0756-75	70-80	Packings, Preformed, Petroleum Hydraulic Fluid Resistant, Improved Performance
AMS-R-83485	VM835-75	70-80	Rubber, Fluorocarbon Elastomer, Improved Performance at Low Temperatures

Note: When ordering parts made with military, AMS, or NAS specification material, see section on ordering.
(1) Aerospace Material Specification issued by the Society of Automotive Engineers, Inc.
(2) National Aerospace Standard issued by Aerospace Industries Association of America, Inc.

Table 8-4: AMS(1) and NAS(2) Rubber Specification Descriptions

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Compound Selections for Commonly Used SAE and ASTM Specifications

This table is in accordance with the 1997 revision of ASTM D2000, which requires that minimum tensile strength indications shall be expressed in SI units (Megapascals). The "M" prefix in these callouts signifies this fact, and the requirement is shown in the 6th and 7th characters of each specification (excluding the "ASTM D2000"). For example, in the specification number M2BC614, the "14" indicates that the tensile strength of the material shall not fall below 14 MPa. To convert this value to psi (pounds per square inch), multiply by 145. In this example, the equivalent is 104.1 Bar (2030 psi) .

Compound Selections For Commonly Used SAE and ASTM Specifications

ASTM D200-97 Specification	MIL-R-3065 ASTM D735-58/ SAE J14 Specification	Parker Compound Number
M2AA708 A13 EA14 F17		E0603-70
M2AA810 A13 EA14 F17 Z1 (Purple)		E0893-80
M2AA810 A13 EA14 F17	$R810BF_2$	E0515-80
M2AA810 A13 EA14 F17	$R810BF_2$	E0540-80
M2AA907 A13 EA14 F17		E0652-90
M3BA707 A14		B0612-70
M2BC510 A14 B14 EO14 EO34 F17	$SC515BE_1E_3F_2$	C0267-50
M3BC614 A14 B14 EO14 EO34 F17	$SC615BE_1E_3F_1$	C0518-60
M3BC710 A14 B14 EO14 EO34	$SC715BE_3F_1$	C0873-70
M3BC710 A14 B14 EO14 EO34 F17	$SC715BE_3F_2$	C1124-70
M2BE510 A14 B14 EO14 EO34 F17		C0267-50
M2BE614 A14 B14 EO14 EO34 F17		C0518-60
M3BE710 A14 B14 EO14 EO34		C0873-70
M2BE710 A14 B14 EO14 EO34 F17		C0147-70
M2BF714 B34 EO14 EO34		N0674-70
M2BG410 B34 EA14 EF11 EF21 EO14 EO34	$SB415BE_1E_3F_1$	N0545-40
M5BG410 A14 B34 EO14 EO34		N0545-40
M2BG510 B14 EA14 EF11 EF21 EO14 EO34 F17	$SB515A_1BE_1E_3F_2$	N0299-50
M2BG510 A14 B14		N0299-50
M2BG608 B34 EA14 EO14 F17 Z1 (65 ± 5 Type A Durometer)	$SB712BE_1F_2$	N0506-65
M2BG614 B34 EA14 EF11 EF21 EO14 EO34 F17	$SB620BE_1F_1$	N0525-60
M2BG708 EA14 EF11 EF21 EO14 EO34 F17		N0602-70
M2BG708 EF11 EF21 EO34 F17		47-071
M5BG710 A14 B14		N0497-70
M2BG710 B14 B34 EA14 EF11 EF21		N0497-70
M2BG714 B14 B34 EA14 EF11 EF21 EO14 EO34	$SB715A_1BE_1E_3$	N0674-70
M(5)BG714 A14 B14 B34 EO14 EO34		N0103-70
M2BG714 B14 B34 EA14 EF11 EF21 EO14 E034 F17	$SB715BE_1E_3F_2$	N0103-70
M4BG721 B14 EO14 EO34		P0642-70
M7BG810 EA14 EF11 EF21 EO14 EO34 Z1 (75 ± 5 Type A Durometer) Z2 (1)		N0951-75
M7BG810 EA14 EF11 EO14 EO34 F16 Z1 (75 ± 5 Type A Durometer)	$SB708E_1E_3F_2$	N0304-75
M7BG910 B14 EA14 EF11 EF21 EO14 EO34 F16	$SB915BE_1E_3$	N0507-90
M2BG910 B14 EA14 EF21 EO14 EO34	$SB915BE_1E_3$	N0552-90
M(2)CA614 A25 B44		E0529-60
M3CA710 A25 B44 EA14		E1244-70
M4CA714 A25 B35 EA14 F17 G21		E0803-70
M8CA814 A25 B35 EA14 F17		E0810-80

Prefix (grade) numbers and suffix letters in parenthesis are technically "not permitted", but nevertheless, they describe a property of the material. Explanations in parenthesis apply to the Z suffix letters.
(1) Compression Set = 20% max. after 70 hours at 125°C when tested on plied discs per ASTM D395.

Table 8-5: Compound Selectons for Commonly Used SAE and ASTM Specifications

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Compound Selections for Commonly Used SAE and ASTM Specifications (Continued)

ASTM D200-97 Specification	MIL-R-3065 ASTM D735-58/ SAE J14 Specification	Parker Compound Number
M2CH608 A25 B34 F17 Z1 (65 ± 5 Type A Durometer)		N0506-65
M3CH708 A25 B14 B34 EO16 EO36 EF31		N0497-70
M2CH708 A25 EO35 F17		47-071
M3CH714 A25 B14 EO16 E036		N0674-70
M3CH714 A25 B34 EO16 EO36		N0674-70
M3CH810 A25 EO16 Z1 (75 ± 5 Type A Durometer) Z2 (1)		N0951-75
M3CH810 A25 EO16 Z1 (75 ± 5 Type A Durometer)		N0304-75
M3CH910 B34 EO16 EO36		N0552-90
M2CH910 EO15 EO35 Z1 (80% Min Elongation)		N1210-90
M3DA710 A26 B36 EA14 Z1 (75+/-5 type A Durometer) Z2 (130% Min Elongation)		EO692-75
M3DA810 A26 B36 EA14		E0540-80
M2DH710 A26 B16 EO16 EO36Z1 (175% Min Elongation)		N1173-70
M2DH810 A26 B16 EO16		N1231-80
M3DH710 A26 B16 EO16 EO36 F13	$TB715E_1E_3$	AA150-70
M2DH910 A26 B36 EO16 EO36		KB163-90
M2FK606 A19 EA36		LM158-60
M2FK606 A19 EF31 Z1 (70+/-5 type A Durometer)		LM159-70
M2GE405 A19 B37 EA14 EO16 EO36 F19 G11		S0469-40
M3GE503 A19 B37 EA14 EO16 EO36 F19 G11	$TA507BE_1E_3F_2$	S0595-50
M3GE603 A19 B37 EA14 EO16 EO36 F19 G11	$TA605BE_1E_3F_2$	S0613-60
M3GE603 A19 EO16 F19		S0317-60
M7GE705 A19 B37 EA14 EO16 EO36 F19 G11	$TA705BE_1E_3F_2$	S0455-70
M7GE705 A19 B37 EA14 EO16 EO36 F19 G11	$TA705BE_1E_3F_2$	S1224-70
M7GE705 F19		S0383-70
M6GE803 A19 B37 EA14 EO16 EO36 F19 G11	$TA805BE_1E_3F_2$	S0614-80
M2HK710 A1 - 10 B37 B38 EF31 EO78 Z1 (75 ± 5 Type A Durometer)		V1164-75
M2HK710 A1 - 10 B37 B38 EF31 EO78 Z1 (75 ± 5 Type A Durometer) Z2 (Brown)		V1226-75
M4HK710 A1 - 11 B38 EF31 EO78 Z1 (75 ± 5 Type A Durometer)		V1164-75
M4HK710 A1 - 11 B38 EF31 EO78 Z1 (75 ± 5 Type A Durometer) Z2 (Brown) Z3 (150% Min Elongation)		V1226-75
M6HK810 A1-10 B38 EF31 EO78 EO88 Z1 (75 ± 5 Type A Durometer)		V0747-75
M7HK810 A1-11 B38 Z1 (75 ± 5 Type A Durometer) Z2 (130% Min Elongation)		VM835-75
M3HK910 A1 - 10 B37 EF31 EO78		V0709-90
M3HK910 A1 - 10 B37 B38 EF31 EO78 Z1 (Brown)		V0894-90
M5HK910 A1 - 11 B38 EF31 EO78		V0709-90
M5HK910 A1 - 11 B38 EF31 EO78 Z1 (Brown)		V0894-90
M2HK910 B37 C12 EF31 Z1 (95 ± 5 Type A Durometer) Z2 (80% Min Elongation)		V1238-95
SAE 120RI Class 1		NA151-70
SAE 120R1 Class 2		N0497-70
SAE J515 Type 1		N0552-90
SAE J515 Type 2		E0652-90

Prefix (grade) numbers and suffix letters in parenthesis are technically “not permitted,” but nevertheless, they describe a property of the material. Explanations in parenthesis apply to the Z suffix letters.
(1) Compression Set = 20% max. after 70 hours at 125°C when tested on plied discs per ASTM D395.

Table 8-5: Compound Selectons for Commonly Used SAE and ASTM Specifications

Revisions from Older Versions of ASTM

Old		New
E14	=	E014
E34	=	E034
L14	=	EA14
E51	=	EF11
E61	=	EF21
E71	=	EF31

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Sizes

Parker Series 2-XXX O-Ring Sizes

1	2	3			4				5	6				7
Parker Size No. (Size Only) (a)	Size Only AS 568A Uniform Dash No.	Nominal Size (Inches) (Ref. Only) I.D.	O.D.	W.	Standard O-Ring Size (Units are in Inches) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	(Ref. Only) Basic Volume Cu. In.	Metric O-Ring Size (Units are in Millimeteres) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	Parker Size No. (Size Only) (a)
2-001	-001	1/32	3/32	1/32	.029	.004	.040	.003	.0003	0,74	0,10	1,02	0,08	2-001
2-002	-002	3/64	9/64	3/64	.042	.004	.050	.003	.0006	1,07	0,10	1,27	0,08	2-002
2-003	-003	1/16	3/16	1/16	.056	.004	.060	.003	.0010	1,42	0,10	1,52	0,08	2-003
2-004	-004	5/64	13/64	1/16	.070	.005	.070	.003	.0017	1,78	0,13	1,78	0,08	2-004
2-005	-005	3/32	7/32	1/16	.101	.005	.070	.003	.0021	2,57	0,13	1,78	0,08	2-005
2-006	-006	1/8	1/4	1/16	.114	.005	.070	.003	.0022	2,90	0,13	1,78	0,08	2-006
2-007	-007	5/32	9/32	1/16	.145	.005	.070	.003	.0026	3,68	0,13	1,78	0,08	2-007
2-008	-008	3/16	5/16	1/16	.176	.005	.070	.003	.0030	4,47	0,13	1,78	0,08	2-008
2-009	-009	7/32	11/32	1/16	.208	.005	.070	.003	.0034	5,28	0,13	1,78	0,08	2-009
2-010	-010	1/4	3/8	1/16	.239	.005	.070	.003	.0037	6,07	0,13	1,78	0,08	2-010
2-011	-011	5/16	7/16	1/16	.301	.005	.070	.003	.0045	7,65	0,13	1,78	0,08	2-011
2-012	-012	3/8	1/2	1/16	.364	.005	.070	.003	.0052	9,25	0,13	1,78	0,08	2-012
2-013	-013	7/16	9/16	1/16	.426	.005	.070	.003	.0060	10,82	0,13	1,78	0,08	2-013
2-014	-014	1/2	5/8	1/16	.489	.005	.070	.003	.0068	12,42	0,13	1,78	0,08	2-014
2-015	-015	9/16	11/16	1/16	.551	.007	.070	.003	.0075	14,00	0,18	1,78	0,08	2-015
2-016	-016	5/8	3/4	1/16	.614	.009	.070	.003	.0083	15,60	0,23	1,78	0,08	2-016
2-017	-017	11/16	13/16	1/16	.676	.009	.070	.003	.0090	17,17	0,23	1,78	0,08	2-017
2-018	-018	3/4	7/8	1/16	.739	.009	.070	.003	.0098	18,77	0,23	1,78	0,08	2-018
2-019	-019	13/16	15/16	1/16	.801	.009	.070	.003	.0105	20,35	0,23	1,78	0,08	2-019
2-020	-020	7/8	1	1/16	.864	.009	.070	.003	.0113	21,95	0,23	1,78	0,08	2-020
2-021	-021	15/16	1-1/16	1/16	.926	.009	.070	.003	.0120	23,52	0,23	1,78	0,08	2-021
2-022	-022	1	1/8	1/16	.989	.010	.070	.003	.0128	25,12	0,25	1,78	0,08	2-022
2-023	-023	1-1/16	1-3/16	1/16	1.051	.010	.070	.003	.0136	26,70	0,25	1,78	0,08	2-023
2-024	-024	1-1/8	1-1/4	1/16	1.114	.010	.070	.003	.0143	28,30	0,25	1,78	0,08	2-024
2-025	-025	1-3/16	1-5/16	1/16	1.176	.011	.070	.003	.0151	29,87	0,28	1,78	0,08	2-025
2-026	-026	1-1/4	1-3/8	1/16	1.239	.011	.070	.003	.0158	31,47	0,28	1,78	0,08	2-026
2-027	-027	1-5/16	1-7/16	1/16	1.301	.011	.070	.003	.0166	33,05	0,28	1,78	0,08	2-027
2-028	-028	1-3/8	1-1/2	1/16	1.364	.013	.070	.003	.0173	34,65	0,33	1,78	0,08	2-028
2-029	-029	1-1/2	1-5/8	1/16	1.489	.013	.070	.003	.0188	37,82	0,33	1,78	0,08	2-029
2-030	-030	1-5/8	1-3/4	1/16	1.614	.013	.070	.003	.0204	41,00	0,33	1,78	0,08	2-030
2-031	-031	1-3/4	1-7/8	1/16	1.739	.015	.070	.003	.0219	44,17	0,38	1,78	0,08	2-031
2-032	-032	1-7/8	2	1/16	1.864	.015	.070	.003	.0234	47,35	0,38	1,78	0,08	2-032
2-033	-033	2	2-1/8	1/16	1.989	.018	.070	.003	.0249	50,52	0,46	1,78	0,08	2-033
2-034	-034	2-1/8	2-1/4	1/16	2.114	.018	.070	.003	.0264	53,70	0,46	1,78	0,08	2-034
2-035	-035	2-1/4	2-3/8	1/16	2.239	.018	.070	.003	.0279	56,87	0,46	1,78	0,08	2-035
2-036	-036	2-3/8	2-1/2	1/16	2.364	.018	.070	.003	.0294	60,05	0,46	1,78	0,08	2-036
2-037	-037	2-1/2	2-5/8	1/16	2.489	.018	.070	.003	.0309	63,22	0,46	1,78	0,08	2-037
2-038	-038	2-5/8	2-3/4	1/16	2.614	.020	.070	.003	.0324	66,40	0,51	1,78	0,08	2-038
2-039	-039	2-3/4	2-7/8	1/16	2.739	.020	.070	.003	.0340	69,57	0,51	1,78	0,08	2-039
2-040	-040	2-7/8	3	1/16	2.864	.020	.070	.003	.0355	72,75	0,51	1,78	0,08	2-040

(a) The rubber compound must be added when ordering by the 2-size number (i.e., N0674-70 2-007).
(b) This chart provides dimensions for standard (AN) shrinkage materials ONLY. These correspond to AS568A dimensions. O-rings manufactured out of compounds with different shrinkage rates (other than AN) will produce slightly different dimensions and tolerances. For more information on shrinkage rates, see the Appendix.
(c) When ordering O-rings to a Military, AMS or NAS material Specification, see Section VIII, Specifications, for more information.

.040 Area = .001256
.050 Area = .001964
.060 Area = .002827
.070 Area = .003848
(sq. in.)

Table 9-1: Parker Series 2-XXX O-Ring Sizes

Parker Hannifin Corporation • O-Ring Division
2360 Palumbo Drive, Lexington, KY 40509
Phone: (859) 269-2351 • Fax: (859) 335-5128
www.parkerorings.com

Parker Series 2-XXX O-Ring Sizes (Continued)

1	2	3			4				5	6				7
Parker Size No. (Size Only) (a)	Size Only AS 568A Uniform Dash No.	Nominal Size (Inches) (Ref. Only) I.D.	O.D.	W.	Standard O-Ring Size (Units are in Inches) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	(Ref. Only) Basic Volume Cu. In.	Metric O-Ring Size (Units are in Millimeteres) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	Parker Size No. (Size Only) (a)
2-041	-041	3	3-1/8	1/16	2.989	.024	.070	.003	.0370	75,92	0,61	1,78	0,08	2-041
2-042	-042	3-1/4	3-3/8	1/16	3.239	.024	.070	.003	.0400	82,27	0,61	1,78	0,08	2-042
2-043	-043	3-1/2	3-5/8	1/16	3.489	.024	.070	.003	.0430	88,62	0,61	1,78	0,08	2-043
2-044	-044	3-3/4	3-7/8	1/16	3.739	.027	.070	.003	.0460	94,97	0,69	1,78	0,08	2-044
2-045	-045	4	4-1/8	1/16	3.989	.027	.070	.003	.0491	101,32	0,69	1,78	0,08	2-045
2-046	-046	4-1/4	4-3/8	1/16	4.239	.030	.070	.003	.0521	107,67	0,76	1,78	0,08	2-046
2-047	-047	4-1/2	4-5/8	1/16	4.489	.030	.070	.003	.0551	114,02	0,76	1,78	0,08	2-047
2-048	-048	4-3/4	4-7/8	1/16	4.739	.030	.070	.003	.0581	120,37	0,76	1,78	0,08	2-048
2-049	-049	5	5-1/8	1/16	4.989	.037	.070	.003	.0612	126,72	0,94	1,78	0,08	2-049
2-050	-050	5-1/4	5-3/8	1/16	5.239	.037	.070	.003	.0642	133,07	0,94	1,78	0,08	2-050
2-102	-102	1/16	1/4	3/32	.049	.005	.103	.003	.0040	1,24	0,13	2,62	0,08	2-102
2-103	-103	3/32	9/32	3/32	.081	.005	.103	.003	.0048	2,06	0,13	2,62	0,08	2-103
2-104	-104	1/8	5/16	3/32	.112	.005	.103	.003	.0056	2,84	0,13	2,62	0,08	2-104
2-105	-105	5/32	11/32	3/32	.143	.005	.103	.003	.0064	3,63	0,13	2,62	0,08	2-105
2-106	-106	3/16	3/8	3/32	.174	.005	.103	.003	.0072	4,42	0,13	2,62	0,08	2-106
2-107	-107	7/32	13/32	3/32	.206	.005	.103	.003	.0081	5,23	0,13	2,62	0,08	2-107
2-108	-108	1/4	7/16	3/32	.237	.005	.103	.003	.0089	6,02	0,13	2,62	0,08	2-108
2-109	-109	5/16	1/2	3/32	.299	.005	.103	.003	.0105	7,59	0,13	2,62	0,08	2-109
2-110	-110	3/8	9/16	3/32	.362	.005	.103	.003	.0122	9,19	0,13	2,62	0,08	2-110
2-111	-111	7/16	5/8	3/32	.424	.005	.103	.003	.0138	10,77	0,13	2,62	0,08	2-111
2-112	-112	1/2	11/16	3/32	.487	.005	.103	.003	.0154	12,37	0,13	2,62	0,08	2-112
2-113	-113	9/16	3/4	3/32	.549	.007	.103	.003	.0171	13,94	0,18	2,62	0,08	2-113
2-114	-114	5/8	13/16	3/32	.612	.009	.103	.003	.0187	15,54	0,23	2,62	0,08	2-114
2-115	-115	11/16	7/8	3/32	.674	.009	.103	.003	.0203	17,12	0,23	2,62	0,08	2-115
2-116	-116	3/4	15/16	3/32	.737	.009	.103	.003	.0220	18,72	0,23	2,62	0,08	2-116
2-117	-117	13/16	1	3/32	.799	.010	.103	.003	.0236	20,29	0,25	2,62	0,08	2-117
2-118	-118	7/8	1-1/16	3/32	.862	.010	.103	.003	.0253	21,89	0,25	2,62	0,08	2-118
2-119	-119	15/16	1-1/8	3/32	.924	.010	.103	.003	.0269	23,47	0,25	2,62	0,08	2-119
2-120	-120	1	1-3/16	3/32	.987	.010	.103	.003	.0285	25,07	0,25	2,62	0,08	2-120
2-121	-121	1-1/16	1-1/4	3/32	1.049	.010	.103	.003	.0302	26,64	0,25	2,62	0,08	2-121
2-122	-122	1-1/8	1-5/16	3/32	1.112	.010	.103	.003	.0318	28,24	0,25	2,62	0,08	2-122
2-123	-123	1-3/16	1-3/8	3/32	1.174	.012	.103	.003	.0334	29,82	0,30	2,62	0,08	2-123
2-124	-124	1-1/4	1-7/16	3/32	1.237	.012	.103	.003	.0351	31,42	0,30	2,62	0,08	2-124
2-125	-125	1-5/16	1-1/2	3/32	1.299	.012	.103	.003	.0367	32,99	0,30	2,62	0,08	2-125
2-126	-126	1-3/8	1-9/16	3/32	1.362	.012	.103	.003	.0383	34,59	0,30	2,62	0,08	2-126
2-127	-127	1-7/16	1-5/8	3/32	1.424	.012	.103	.003	.0400	36,17	0,30	2,62	0,08	2-127
2-128	-128	1-1/2	1-11/16	3/32	1.487	.012	.103	.003	.0416	37,77	0,30	2,62	0,08	2-128
2-129	-129	1-9/16	1-3/4	3/32	1.549	.015	.103	.003	.0432	39,34	0,38	2,62	0,08	2-129
2-130	-130	1-5/8	1-13/16	3/32	1.612	.015	.103	.003	.0449	40,94	0,38	2,62	0,08	2-130
2-131	-131	1-11/16	1-7/8	3/32	1.674	.015	.103	.003	.0465	42,52	0,38	2,62	0,08	2-131

(a) The rubber compound must be added when ordering by the 2-size number (i.e., N0674-70 2-007).

(b) This chart provides dimensions for standard (AN) shrinkage materials ONLY. These correspond to AS568A dimensions. O-ringsmanufactured out of compounds with different shrinkage rates (other than AN) will produce slightly different dimensions andtolerances. For more information on shrinkage rates, see the Appendix.

.070 Area = .003848
.103 Area = .008332
(sq. in.)

(c) When ordering O-rings to a Military, AMS or NAS material Specification, see Section VIII, Specifications, for more information.

Table 9-1: Parker Series 2-XXX O-Ring Sizes

Parker Hannifin Corporation • O-Ring Division
2360 Palumbo Drive, Lexington, KY 40509
Phone: (859) 269-2351 • Fax: (859) 335-5128
www.parkerorings.com

Parker Series 2-XXX O-Ring Sizes (Continued)

1	2	3			4				5	6				7
Parker Size No. (Size Only) (a)	Size Only AS 568A Uniform Dash No.	Nominal Size (Inches) (Ref. Only) I.D.	O.D.	W.	Standard O-Ring Size (Units are in Inches) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	(Ref. Only) Basic Volume Cu. In.	Metric O-Ring Size (Units are in Millimeteres) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	Parker Size No. (Size Only) (a)
2-132	-132	1-3/4	1-15/16	3/32	1.737	.015	.103	.003	.0482	44,12	0,38	2,62	0,08	2-132
2-133	-133	1-13/16	2	3/32	1.799	.015	.103	.003	.0498	45,69	0,38	2,62	0,08	2-133
2-134	-134	1-7/8	2-1/16	3/32	1.862	.015	.103	.003	.0514	47,29	0,38	2,62	0,08	2-134
2-135	-135	1-15/16	2-1/8	3/32	1.925	.017	.103	.003	.0531	48,90	0,43	2,62	0,08	2-135
2-136	-136	2	2-3/16	3/32	1.987	.017	.103	.003	.0547	50,47	0,43	2,62	0,08	2-136
2-137	-137	2-1/16	2-1/4	3/32	2.050	.017	.103	.003	.0564	52,07	0,43	2,62	0,08	2-137
2-138	-138	2-1/8	2-5/16	3/32	2.112	.017	.103	.003	.0580	53,64	0,43	2,62	0,08	2-138
2-139	-139	2-3/16	2-3/8	3/32	2.175	.017	.103	.003	.0596	55,25	0,43	2,62	0,08	2-139
2-140	-140	2-1/4	2-7/16	3/32	2.237	.017	.103	.003	.0612	56,82	0,43	2,62	0,08	2-140
2-141	-141	2-5/16	2-1/2	3/32	2.300	.020	.103	.003	.0629	58,42	0,51	2,62	0,08	2-141
2-142	-142	2-3/8	2-9/16	3/32	2.362	.020	.103	.003	.0645	59,99	0,51	2,62	0,08	2-142
2-143	-143	2-7/16	2-5/8	3/32	2.425	.020	.103	.003	.0662	61,60	0,51	2,62	0,08	2-143
2-144	-144	2-1/2	2-11/16	3/32	2.487	.020	.103	.003	.0678	63,17	0,51	2,62	0,08	2-144
2-145	-145	2-9/16	2-3/4	3/32	2.550	.020	.103	.003	.0694	64,77	0,51	2,62	0,08	2-145
2-146	-146	2-5/8	2-13/16	3/32	2.612	.020	.103	.003	.0711	66,34	0,51	2,62	0,08	2-146
2-147	-147	2-11/16	2-7/8	3/32	2.675	.022	.103	.003	.0727	67,95	0,56	2,62	0,08	2-147
2-148	-148	2-3/4	2-15/16	3/32	2.737	.022	.103	.003	.0743	69,52	0,56	2,62	0,08	2-148
2-149	-149	2-13/16	3	3/32	2.800	.022	.103	.003	.0760	71,12	0,56	2,62	0,08	2-149
2-150	-150	2-7/8	3-1/16	3/32	2.862	.022	.103	.003	.0776	72,69	0,56	2,62	0,08	2-150
2-151	-151	3	3-3/16	3/32	2.987	.024	.103	.003	.0809	75,87	0,61	2,62	0,08	2-151
2-152	-152	3-1/4	3-7/16	3/32	3.237	.024	.103	.003	.0874	82,22	0,61	2,62	0,08	2-152
2-153	-153	3-1/2	3-11/16	3/32	3.487	.024	.103	.003	.0940	88,57	0,61	2,62	0,08	2-153
2-154	-154	3-3/4	3-15/16	3/32	3.737	.028	.103	.003	.1005	94,92	0,71	2,62	0,08	2-154
2-155	-155	4	4-3/16	3/32	3.987	.028	.103	.003	.1071	101,27	0,71	2,62	0,08	2-155
2-156	-156	4-1/4	4-7/16	3/32	4.237	.030	.103	.003	.1136	107,62	0,76	2,62	0,08	2-156
2-157	-157	4-1/2	4-11/16	3/32	4.487	.030	.103	.003	.1202	113,97	0,76	2,62	0,08	2-157
2-158	-158	4-3/4	4-15/16	3/32	4.737	.030	.103	.003	.1267	120,32	0,76	2,62	0,08	2-158
2-159	-159	5	5-3/16	3/32	4.987	.035	.103	.003	.1332	126,67	0,89	2,62	0,08	2-159
2-160	-160	5-1/4	5-7/16	3/32	5.237	.035	.103	.003	.1398	133,02	0,89	2,62	0,08	2-160
2-161	-161	5-1/2	5-11/16	3/32	5.487	.035	.103	.003	.1463	139,37	0,89	2,62	0,08	2-161
2-162	-162	5-3/4	5-15/16	3/32	5.737	.035	.103	.003	.1529	145,72	0,89	2,62	0,08	2-162
2-163	-163	6	6-3/16	3/32	5.987	.035	.103	.003	.1594	152,07	0,89	2,62	0,08	2-163
2-164	-164	6-1/4	6-7/16	3/32	6.237	.040	.103	.003	.1660	158,42	1,02	2,62	0,08	2-164
2-165	-165	6-1/2	6-11/16	3/32	6.487	.040	.103	.003	.1725	164,77	1,02	2,62	0,08	2-165
2-166	-166	6-3/4	6-15/16	3/32	6.737	.040	.103	.003	.1790	171,12	1,02	2,62	0,08	2-166
2-167	-167	7	7-3/16	3/32	6.987	.040	.103	.003	.1856	177,47	1,02	2,62	0,08	2-167
2-168	-168	7-1/4	7-7/16	3/32	7.237	.045	.103	.003	.1921	183,82	1,14	2,62	0,08	2-168
2-169	-169	7-1/2	7-11/16	3/32	7.487	.045	.103	.003	.1987	190,17	1,14	2,62	0,08	2-169
2-170	-170	7-3/4	7-15/16	3/32	7.737	.045	.103	.003	.2052	196,52	1,14	2,62	0,08	2-170
2-171	-171	8	8-3/16	3/32	7.987	.045	.103	.003	.2118	202,87	1,14	2,62	0,08	2-171

(a) The rubber compound must be added when ordering by the 2-size number (i.e., N0674-70 2-007).

(b) This chart provides dimensions for standard (AN) shrinkage materials ONLY. These correspond to AS568A dimensions. O-rings manufactured out of compounds with different shrinkage rates (other than AN) will produce slightly different dimensions and tolerances. For more information on shrinkage rates, see the Appendix.

(c) When ordering O-rings to a Military, AMS or NAS material Specification, see Section VIII, Specifications, for more information.

.103 Area = .008332 (sq. in.)

Table 9-1: Parker Series 2-XXX O-Ring Sizes

Parker Hannifin Corporation • O-Ring Division
2360 Palumbo Drive, Lexington, KY 40509
Phone: (859) 269-2351 • Fax: (859) 335-5128
www.parkerorings.com

Parker Series 2-XXX O-Ring Sizes (Continued)

1	2	3			4				5	6				7
Parker Size No. (Size Only) (a)	Size Only AS 568A Uniform Dash No.	Nominal Size (Inches) (Ref. Only) I.D.	O.D.	W.	Standard O-Ring Size (Units are in Inches) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	(Ref. Only) Basic Volume Cu. In.	Metric O-Ring Size (Units are in Millimeteres) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	Parker Size No. (Size Only) (a)
2-172	-172	8-1/4	8-7/16	3/32	8.237	.050	.103	.003	.2183	209,22	1,27	2,62	0,08	2-172
2-173	-173	8-1/2	8-11/16	3/32	8.487	.050	.103	.003	.2249	215,57	1,27	2,62	0,08	2-173
2-174	-174	8-3/4	8-15/16	3/32	8.737	.050	.103	.003	.2314	221,92	1,27	2,62	0,08	2-174
2-175	-175	9	9-3/16	3/32	8.987	.050	.103	.003	.2379	228,27	1,27	2,62	0,08	2-175
2-176	-176	9-1/4	9-7/16	3/32	9.237	.055	.103	.003	.2445	234,62	1,40	2,62	0,08	2-176
2-177	-177	9-1/2	9-11/16	3/32	9.487	.055	.103	.003	.2510	240,97	1,40	2,62	0,08	2-177
2-178	-178	9-3/4	9-15/16	3/32	9.737	.055	.103	.003	.2576	247,32	1,40	2,62	0,08	2-178
2-201	-201	3/16	7/16	1/8	.171	.055	.139	.004	.0148	4,34	0,13	3,53	0,10	2-201
2-202	-202	1/4	1/2	1/8	.234	.005	.139	.004	.0178	5,94	0,13	3,53	0,10	2-202
2-203	-203	5/16	9/16	1/8	.296	.005	.139	.004	.0207	7,52	0,13	3,53	0,10	2-203
2-204	-204	3/8	5/8	1/8	.359	.005	.139	.004	.0237	9,12	0,13	3,53	0,10	2-204
2-205	-205	7/16	11/16	1/8	.421	.005	.139	.004	.0267	10,69	0,13	3,53	0,10	2-205
2-206	-206	1/2	3/4	1/8	.484	.005	.139	.004	.0297	12,29	0,13	3,53	0,10	2-206
2-207	-207	9/16	13/16	1/8	.546	.007	.139	.004	.0327	13,87	0,18	3,53	0,10	2-207
2-208	-208	5/8	7/8	1/8	.609	.009	.139	.004	.0357	15,47	0,23	3,53	0,10	2-208
2-209	-209	11/16	15/16	1/8	.671	.010	.139	.004	.0386	17,04	0,23	3,53	0,10	2-209
2-210	-210	3/4	1	1/8	.734	.010	.139	.004	.0416	18,64	0,25	3,53	0,10	2-210
2-211	-211	13/16	1-1/16	1/8	.796	.010	.139	.004	.0446	20,22	0,25	3,53	0,10	2-211
2-212	-212	7/8	1-1/8	1/8	.859	.010	.139	.004	.0476	21,82	0,25	3,53	0,10	2-212
2-213	-213	15/16	1-3/16	1/8	.921	.010	.139	.004	.0505	23,39	0,25	3,53	0,10	2-213
2-214	-214	1	1-1/4	1/8	.984	.010	.139	.004	.0535	24,99	0,25	3,53	0,10	2-214
2-215	-215	1-1/16	1-5/16	1/8	1.046	.010	.139	.004	.0565	26,57	0,25	3,53	0,10	2-215
2-216	-216	1-1/8	1-3/8	1/8	1.109	.012	.139	.004	.0595	28,17	0,30	3,53	0,10	2-216
2-217	-217	1-3/16	1-7/16	1/8	1.171	.012	.139	.004	.0624	29,74	0,30	3,53	0,10	2-217
2-218	-218	1-1/4	1-1/2	1/8	1.234	.012	.139	.004	.0654	31,34	0,30	3,53	0,10	2-218
2-219	-219	1-5/16	1-9/16	1/8	1.296	.012	.139	.004	.0684	32,92	0,30	3,53	0,10	2-219
2-220	-220	1-3/8	1-5/8	1/8	1.359	.012	.139	.004	.0714	34,52	0,30	3,53	0,10	2-220
2-221	-221	1-7/16	1-11/16	1/8	1.421	.012	.139	.004	.0744	36,09	0,30	3,53	0,10	2-221
2-222	-222	1-1/2	1-3/4	1/8	1.484	.015	.139	.004	.0774	37,69	0,38	3,53	0,10	2-222
2-223	-223	1-5/8	1-7/8	1/8	1.609	.015	.139	.004	.0833	40,87	0,38	3,53	0,10	2-223
2-224	-224	1-3/4	2	1/8	1.734	.015	.139	.004	.0893	44,04	0,38	3,53	0,10	2-224
2-225	-225	1-7/8	2-1/8	1/8	1.859	.018	.139	.004	.0952	47,22	0,46	3,53	0,10	2-225
2-226	-226	2	2-1/4	1/8	1.984	.018	.139	.004	.1012	50,39	0,46	3,53	0,10	2-226
2-227	-227	2-1/16	2-3/8	1/8	2.109	.018	.139	.004	.1072	53,57	0,46	3,53	0,10	2-227
2-228	-228	2-1/4	2-1/2	1/8	2.234	.020	.139	.004	.1131	56,74	0,51	3,53	0,10	2-228
2-229	-229	2-3/8	2-5/8	1/8	2.359	.020	.139	.004	.1191	59,92	0,51	3,53	0,10	2-229
2-230	-230	2-1/2	2-3/4	1/8	2.484	.020	.139	.004	.1250	63,09	0,51	3,53	0,10	2-230
2-231	-231	2-5/8	2-7/8	1/8	2.609	.020	.139	.004	.1310	66,27	0,51	3,53	0,10	2-231
2-232	-232	2-3/4	3	1/8	2.734	.024	.139	.004	.1370	69,44	0,61	3,53	0,10	2-232
2-233	-233	2-7/8	3-1/8	1/8	2.859	.024	.139	.004	.1429	72,62	0,61	3,53	0,10	2-233

(a) The rubber compound must be added when ordering by the 2-size number (i.e., N0674-70 2-007).

(b) This chart provides dimensions for standard (AN) shrinkage materials ONLY. These correspond to AS568A dimensions. O-ringsmanufactured out of compounds with different shrinkage rates (other than AN) will produce slightly different dimensions and tolerances. For more information on shrinkage rates, see the Appendix.

.103 Area = .008332
.139 Area = .015175
(sq. in.)

(c) When ordering O-rings to a Military, AMS or NAS material Specification, see Section VIII, Specifications, for more information.

Table 9-1: Parker Series 2-XXX O-Ring Sizes

Parker Hannifin Corporation • O-Ring Division
2360 Palumbo Drive, Lexington, KY 40509
Phone: (859) 269-2351 • Fax: (859) 335-5128
www.parkerorings.com

Parker Series 2-XXX O-Ring Sizes (Continued)

1	2	3			4				5	6				7
Parker Size No. (Size Only) (a)	Size Only AS 568A Uniform Dash No.	Nominal Size (Inches) (Ref. Only) I.D.	O.D.	W.	Standard O-Ring Size (Units are in Inches) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	(Ref. Only) Basic Volume Cu. In.	Metric O-Ring Size (Units are in Millimeteres) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	Parker Size No. (Size Only) (a)
2-234	-234	3	3-1/4	1/8	2.984	.024	.139	.004	.1489	75,79	0,61	3,53	0,10	2-234
2-235	-235	3-1/8	3-3/8	1/8	3.109	.024	.139	.004	.1548	78,97	0,61	3,53	0,10	2-235
2-236	-236	3-1/4	3-1/2	1/8	3.234	.024	.139	.004	.1608	82,14	0,61	3,53	0,10	2-236
2-237	-237	3-3/8	3-5/8	1/8	3.359	.024	.139	.004	.1668	85,32	0,61	3,53	0,10	2-237
2-238	-238	3-1/2	3-3/4	1/8	3.484	.024	.139	.004	.1727	88,49	0,61	3,53	0,10	2-238
2-239	-239	3-5/8	3-7/8	1/8	3.609	.028	.139	.004	.1787	91,67	0,71	3,53	0,10	2-239
2-240	-240	3-3/4	4	1/8	3.734	.028	.139	.004	.1846	94,84	0,71	3,53	0,10	2-240
2-241	-241	3-7/8	4-1/8	1/8	3.859	.028	.139	.004	.1906	98,02	0,71	3,53	0,10	2-241
2-242	-242	4	4-1/4	1/8	3.984	.028	.139	.004	.1966	101,19	0,71	3,53	0,10	2-242
2-243	-243	4-1/8	4-3/8	1/8	4.109	.028	.139	.004	.2025	104,37	0,71	3,53	0,10	2-243
2-244	-244	4-1/4	4-1/2	1/8	4.234	.030	.139	.004	.2085	107,54	0,76	3,53	0,10	2-244
2-245	-245	4-3/8	4-5/8	1/8	4.359	.030	.139	.004	.2144	110,72	0,76	3,53	0,10	2-245
2-246	-246	4-1/2	4-3/4	1/8	4.484	.030	.139	.004	.2204	113,89	0,76	3,53	0,10	2-246
2-247	-247	4-5/8	4-7/8	1/8	4.609	.030	.139	.004	.2264	117,07	0,76	3,53	0,10	2-247
2-248	-248	4-3/4	5	1/8	4.734	.030	.139	.004	.2323	120,24	0,76	3,53	0,10	2-248
2-249	-249	4-7/8	5-1/8	1/8	4.859	.035	.139	.004	.2383	123,42	0,89	3,53	0,10	2-249
2-250	-250	5	5-1/4	1/8	4.984	.035	.139	.004	.2442	126,59	0,89	3,53	0,10	2-250
2-251	-251	5-1/8	5-3/8	1/8	5.109	.035	.139	.004	.2502	129,77	0,89	3,53	0,10	2-251
2-252	-252	5-1/4	5-1/2	1/8	5.234	.035	.139	.004	.2561	132,94	0,89	3,53	0,10	2-252
2-253	-253	5-3/8	5-5/8	1/8	5.359	.035	.139	.004	.2621	136,12	0,89	3,53	0,10	2-253
2-254	-254	5-1/2	5-3/4	1/8	5.484	.035	.139	.004	.2681	139,29	0,89	3,53	0,10	2-254
2-255	-255	5-5/8	5-7/8	1/8	5.609	.035	.139	.004	.2740	142,47	0,89	3,53	0,10	2-255
2-256	-256	5-3/4	6	1/8	5.734	.035	.139	.004	.2800	145,64	0,89	3,53	0,10	2-256
2-257	-257	5-7/8	6-1/8	1/8	5.859	.035	.139	.004	.2859	148,82	0,89	3,53	0,10	2-257
2-258	-258	6	6-1/4	1/8	5.984	.035	.139	.004	.2919	151,99	0,89	3,53	0,10	2-258
2-259	-259	6-1/4	6-1/2	1/8	6.234	.040	.139	.004	.3038	158,34	1,02	3,53	0,10	2-259
2-260	-260	6-1/2	6-3/4	1/8	6.484	.040	.139	.004	.3157	164,69	1,02	3,53	0,10	2-260
2-261	-261	6-3/4	7	1/8	6.734	.040	.139	.004	.3277	171,04	1,02	3,53	0,10	2-261
2-262	-262	7	7-1/4	1/8	6.984	.040	.139	.004	.3396	177,39	1,02	3,53	0,10	2-262
2-263	-263	7-1/4	7-1/2	1/8	7.234	.045	.139	.004	.3515	183,74	1,14	3,53	0,10	2-263
2-264	-264	7-1/2	7-3/4	1/8	7.484	.045	.139	.004	.3634	190,09	1,14	3,53	0,10	2-264
2-265	-265	7-3/4	8	1/8	7.734	.045	.139	.004	.3753	196,44	1,14	3,53	0,10	2-265
2-266	-266	8	8-1/4	1/8	7.984	.045	.139	.004	.3872	202,79	1,14	3,53	0,10	2-266
2-267	-267	8-1/4	8-1/2	1/8	8.234	.050	.139	.004	.3992	209,14	1,27	3,53	0,10	2-267
2-268	-268	8-1/2	8-3/4	1/8	8.484	.050	.139	.004	.4111	215,49	1,27	3,53	0,10	2-268
2-269	-269	8-3/4	9	1/8	8.734	.050	.139	.004	.4230	221,84	1,27	3,53	0,10	2-269
2-270	-270	9	9-1/4	1/8	8.984	.050	.139	.004	.4349	228,19	1,27	3,53	0,10	2-270
2-271	-271	9-1/4	9-1/2	1/8	9.234	.055	.139	.004	.4468	234,54	1,40	3,53	0,10	2-271
2-272	-272	9-1/2	9-3/4	1/8	9.484	.055	.139	.004	.4588	240,89	1,40	3,53	0,10	2-272
2-273	-273	9-3/4	10	1/8	9.734	.055	.139	.004	.4707	247,24	1,40	3,53	0,10	2-273

(a) The rubber compound must be added when ordering by the 2-size number (i.e., N0674-70 2-007).

(b) This chart provides dimensions for standard (AN) shrinkage materials ONLY. These correspond to AS568A dimensions. O-rings manufactured out of compounds with different shrinkage rates (other than AN) will produce slightly different dimensions and tolerances. For more information on shrinkage rates, see the Appendix.

(c) When ordering O-rings to a Military, AMS or NAS material Specification, see Section VIII, Specifications, for more information.

.139 Area = .015175 (sq. in.)

Table 9-1: Parker Series 2-XXX O-Ring Sizes

Parker Hannifin Corporation • O-Ring Division
2360 Palumbo Drive, Lexington, KY 40509
Phone: (859) 269-2351 • Fax: (859) 335-5128
www.parkerorings.com

Parker Series 2-XXX O-Ring Sizes (Continued)

1	2	3			4				5	6				7
Parker Size No. (Size Only) (a)	Size Only AS 568A Uniform Dash No.	Nominal Size (Inches) (Ref. Only) I.D.	O.D.	W.	Standard O-Ring Size (Units are in Inches) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	(Ref. Only) Basic Volume Cu. In.	Metric O-Ring Size (Units are in Millimeteres) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	Parker Size No. (Size Only) (a)
2-274	-274	10	10-1/4	1/8	9.984	.055	.139	.004	.4826	253,59	1,40	3,53	0,10	2-274
2-275	-275	10-1/2	10-3/4	1/8	10.484	.055	.139	.004	.5064	266,29	1,40	3,53	0,10	2-275
2-276	-276	11	11-1/4	1/8	10.984	.065	.139	.004	.5303	278,99	1,65	3,53	0,10	2-276
2-277	-277	11-1/2	11-3/4	1/8	11.484	.065	.139	.004	.5541	291,69	1,65	3,53	0,10	2-277
2-278	-278	12	12-1/4	1/8	11.984	.065	.139	.004	.5779	304,39	1,65	3,53	0,10	2-278
2-279	-279	13	13-1/4	1/8	12.984	.065	.139	.004	.6256	329,79	1,65	3,53	0,10	2-279
2-280	-280	14	14-1/4	1/8	13.984	.065	.139	.004	.6733	355,19	1,65	3,53	0,10	2-280
2-281	-281	15	15-1/4	1/8	14.984	.065	.139	.004	.7210	380,59	1,65	3,53	0,10	2-281
2-282	-282	16	16-1/4	1/8	15.955	.075	.139	.004	.7672	405,26	1,91	3,53	0,10	2-282
2-283	-283	17	17-1/4	1/8	16.955	.080	.139	.004	.8149	430,66	2,03	3,53	0,10	2-283
2-284	-284	18	18-1/4	1/8	17.955	.085	.139	.004	.8626	456,06	2,16	3,53	0,10	2-284
2-309	-309	7/16	13/16	3/16	.412	.005	.210	.005	.0677	10,46	0,13	5,33	0,13	2-309
2-310	-310	1/2	7/8	3/16	.475	.005	.210	.005	.0745	12,07	0,13	5,33	0,13	2-310
2-311	-311	9/16	15/16	3/16	.537	.007	.210	.005	.0813	13,64	0,18	5,33	0,13	2-311
2-312	-312	5/8	1	3/16	.600	.009	.210	.005	.0881	15,24	0,23	5,33	0,13	2-312
2-313	-313	11/16	1-1/16	3/16	.662	.009	.210	.005	.0949	16,81	0,23	5,33	0,13	2-313
2-314	-314	3/4	1-1/8	3/16	.725	.010	.210	.005	.1017	18,42	0,25	5,33	0,13	2-314
2-315	-315	13/16	1-3/16	3/16	.787	.010	.210	.005	.1085	19,99	0,25	5,33	0,13	2-315
2-316	-316	7/8	1-1/4	3/16	.850	.010	.210	.005	.1153	21,59	0,25	5,33	0,13	2-316
2-317	-317	15/16	1-5/16	3/16	.912	.010	.210	.005	.1221	23,16	0,25	5,33	0,13	2-317
2-318	-318	1	1-3/8	3/16	.975	.010	.210	.005	.1289	24,77	0,25	5,33	0,13	2-318
2-319	-319	1-1/16	1-7/16	3/16	1.037	.010	.210	.005	.1357	26,34	0,25	5,33	0,13	2-319
2-320	-320	1-1/8	1-1/2	3/16	1.100	.012	.210	.005	.1425	27,94	0,30	5,33	0,13	2-320
2-321	-321	1-3/16	1-9/16	3/16	1.162	.012	.210	.005	.1493	29,51	0,30	5,33	0,13	2-321
2-322	-322	1-1/4	1-5/8	3/16	1.225	.012	.210	.005	.1561	31,12	0,30	5,33	0,13	2-322
2-323	-323	1-5/16	1-11/16	3/16	1.287	.012	.210	.005	.1629	32,69	0,30	5,33	0,13	2-323
2-324	-324	1-3/8	1-3/4	3/16	1.350	.012	.210	.005	.1697	34,29	0,30	5,33	0,13	2-324
2-325	-325	1-1/2	1-7/8	3/16	1.475	.015	.210	.005	.1833	37,47	0,38	5,33	0,13	2-325
2-326	-326	1-5/8	2	3/16	1.600	.015	.210	.005	.1970	40,64	0,38	5,33	0,13	2-326
2-327	-327	1-3/4	2-1/8	3/16	1.725	.015	.210	.005	.2106	43,82	0,38	5,33	0,13	2-327
2-328	-328	1-7/8	2-1/4	3/16	1.850	.015	.210	.005	.2242	46,99	0,38	5,33	0,13	2-328
2-329	-329	2	2-3/8	3/16	1.975	.018	.210	.005	.2378	50,17	0,46	5,33	0,13	2-329
2-330	-330	2-1/8	2-1/2	3/16	2.100	.018	.210	.005	.2514	53,34	0,46	5,33	0,13	2-330
2-331	-331	2-1/4	2-5/8	3/16	2.225	.018	.210	.005	.2650	56,52	0,46	5,33	0,13	2-331
2-332	-332	2-3/8	2-3/4	3/16	2.350	.018	.210	.005	.2786	59,69	0,46	5,33	0,13	2-332
2-333	-333	2-1/2	2-7/8	3/16	2.475	.020	.210	.005	.2922	62,87	0,51	5,33	0,13	2-333
2-334	-334	2-5/8	3	3/16	2.600	.020	.210	.005	.3058	66,04	0,51	5,33	0,13	2-334
2-335	-335	2-3/4	3-1/8	3/16	2.725	.020	.210	.005	.3194	69,22	0,51	5,33	0,13	2-335
2-336	-336	2-7/8	3-1/4	3/16	2.850	.020	.210	.005	.3330	72,39	0,51	5,33	0,13	2-336
2-337	-337	3	3-3/8	3/16	2.975	.024	.210	.005	.3466	75,57	0,61	5,33	0,13	2-337

(a) The rubber compound must be added when ordering by the 2-size number (i.e., N0674-70 2-007).
(b) This chart provides dimensions for standard (AN) shrinkage materials ONLY. These correspond to AS568A dimensions. O-ringsmanufactured out of compounds with different shrinkage rates (other than AN) will produce slightly different dimensions and tolerances. For more information on shrinkage rates, see the Appendix.
(c) When ordering O-rings to a Military, AMS or NAS material Specification, see Section VIII, Specifications, for more information.

.139 Area = .015175
.210 Area = .034636
(sq. in.)

Table 9-1: Parker Series 2-XXX O-Ring Sizes

Parker Hannifin Corporation • O-Ring Division
2360 Palumbo Drive, Lexington, KY 40509
Phone: (859) 269-2351 • Fax: (859) 335-5128
www.parkerorings.com

Parker Series 2-XXX O-Ring Sizes (Continued)

1	2	3			4				5	6				7
Parker Size No. (Size Only) (a)	Size Only AS 568A Uniform Dash No.	Nominal Size (Inches) (Ref. Only) I.D.	O.D.	W.	Standard O-Ring Size (Units are in Inches) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	(Ref. Only) Basic Volume Cu. In.	Metric O-Ring Size (Units are in Millimeteres) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	Parker Size No. (Size Only) (a)
2-338	-338	3-1/8	3-1/2	3/16	3.100	.024	.210	.005	.3602	78,74	0,61	5,33	0,13	2-338
2-339	-339	3-1/4	3-5/8	3/16	3.225	.024	.210	.005	.3738	81,92	0,61	5,33	0,13	2-339
2-340	-340	3-3/8	3-3/4	3/16	3.350	.024	.210	.005	.3874	85,09	0,61	5,33	0,13	2-340
2-341	-341	3-1/2	3-7/8	3/16	3.475	.024	.210	.005	.4010	88,27	0,61	5,33	0,13	2-341
2-342	-342	3-5/8	4	3/16	3.600	.028	.210	.005	.4146	91,44	0,71	5,33	0,13	2-342
2-343	-343	3-3/4	4-1/8	3/16	3.725	.028	.210	.005	.4282	94,62	0,71	5,33	0,13	2-343
2-344	-344	3-7/8	4-1/4	3/16	3.850	.028	.210	.005	.4418	97,79	0,71	5,33	0,13	2-344
2-345	-345	4	4-3/8	3/16	3.975	.028	.210	.005	.4554	100,97	0,71	5,33	0,13	2-345
2-346	-346	4-1/8	4-1/2	3/16	4.100	.028	.210	.005	.4690	104,14	0,71	5,33	0,13	2-346
2-347	-347	4-1/4	4-5/8	3/16	4.225	.030	.210	.005	.4826	107,32	0,76	5,33	0,13	2-347
2-348	-348	4-3/8	4-3/4	3/16	4.350	.030	.210	.005	.4962	110,49	0,76	5,33	0,13	2-348
2-349	-349	4-1/2	4-7/8	3/16	4.475	.030	.210	.005	.5098	113,67	0,76	5,33	0,13	2-349
2-350	-350	4-5/8	5	3/16	4.600	.030	.210	.005	.5234	116,84	0,76	5,33	0,13	2-350
2-351	-351	4-3/4	5-1/8	3/16	4.725	.030	.210	.005	.5370	120,02	0,76	5,33	0,13	2-351
2-352	-352	4-7/8	5-1/4	3/16	4.850	.030	.210	.005	.5506	123,19	0,76	5,33	0,13	2-352
2-353	-353	5	5-3/8	3/16	4.975	.037	.210	.005	.5642	126,37	0,94	5,33	0,13	2-353
2-354	-354	5-1/8	5-1/2	3/16	5.100	.037	.210	.005	.5778	129,54	0,94	5,33	0,13	2-354
2-355	-355	5-1/4	5-5/8	3/16	5.225	.037	.210	.005	.5914	132,72	0,94	5,33	0,13	2-355
2-356	-356	5-3/8	5-3/4	3/16	5.350	.037	.210	.005	.6050	135,89	0,94	5,33	0,13	2-356
2-357	-357	5-1/2	5-7/8	3/16	5.475	.037	.210	.005	.6186	139,07	0,94	5,33	0,13	2-357
2-358	-358	5-5/8	6	3/16	5.600	.037	.210	.005	.6322	142,24	0,94	5,33	0,13	2-358
2-359	-359	5-3/4	6-1/8	3/16	5.725	.037	.210	.005	.6458	145,42	0,94	5,33	0,13	2-359
2-360	-360	5-7/8	6-1/4	3/16	5.850	.037	.210	.005	.6594	148,59	0,94	5,33	0,13	2-360
2-361	-361	6	6-3/8	3/16	5.975	.037	.210	.005	.6730	151,77	0,94	5,33	0,13	2-361
2-362	-362	6-1/4	6-5/8	3/16	6.225	.040	.210	.005	.7002	158,12	1,02	5,33	0,13	2-362
2-363	-363	6-1/2	6-7/8	3/16	6.475	.040	.210	.005	.7274	164,47	1,02	5,33	0,13	2-363
2-364	-364	6-3/4	7-1/8	3/16	6.725	.040	.210	.005	.7546	170,82	1,02	5,33	0,13	2-364
2-365	-365	7	7-3/8	3/16	6.975	.040	.210	.005	.7818	177,17	1,02	5,33	0,13	2-365
2-366	-366	7-1/4	7-5/8	3/16	7.225	.045	.210	.005	.8090	183,52	1,14	5,33	0,13	2-366
2-367	-367	7-1/2	7-7/8	3/16	7.475	.045	.210	.005	.8362	189,87	1,14	5,33	0,13	2-367
2-368	-368	7-3/4	8-1/8	3/16	7.725	.045	.210	.005	.8634	196,22	1,14	5,33	0,13	2-368
2-369	-369	8	8-3/8	3/16	7.975	.045	.210	.005	.8906	202,57	1,14	5,33	0,13	2-369
2-370	-370	8-1/4	8-5/8	3/16	8.225	.050	.210	.005	.9178	208,92	1,27	5,33	0,13	2-370
2-371	-371	8-1/2	8-7/8	3/16	8.475	.050	.210	.005	.9450	215,27	1,27	5,33	0,13	2-371
2-372	-372	8-3/4	9-1/8	3/16	8.725	.050	.210	.005	.9722	221,62	1,27	5,33	0,13	2-372
2-373	-373	9	9-3/8	3/16	8.975	.050	.210	.005	.9994	227,97	1,27	5,33	0,13	2-373
2-374	-374	9-1/4	9-5/8	3/16	9.225	.055	.210	.005	1.0266	234,32	1,40	5,33	0,13	2-374
2-375	-375	9-1/2	9-7/8	3/16	9.475	.055	.210	.005	1.0538	240,67	1,40	5,33	0,13	2-375
2-376	-376	9-3/4	10-1/8	3/16	9.725	.055	.210	.005	1.0810	247,02	1,40	5,33	0,13	2-376
2-377	-377	10	10-3/8	3/16	9.975	.055	.210	.005	1.1083	253,37	1,40	5,33	0,13	2-377

(a) The rubber compound must be added when ordering by the 2-size number (i.e., N0674-70 2-007).

(b) This chart provides dimensions for standard (AN) shrinkage materials ONLY. These correspond to AS568A dimensions. O-rings manufactured out of compounds with different shrinkage rates (other than AN) will produce slightly different dimensions and tolerances. For more information on shrinkage rates, see the Appendix.

(c) When ordering O-rings to a Military, AMS or NAS material Specification, see Section VIII, Specifications, for more information.

.210 Area = .034636 (sq. in.)

Table 9-1: Parker Series 2-XXX O-Ring Sizes

Parker Hannifin Corporation • O-Ring Division
2360 Palumbo Drive, Lexington, KY 40509
Phone: (859) 269-2351 • Fax: (859) 335-5128
www.parkerorings.com

Parker Series 2-XXX O-Ring Sizes (Continued)

1	2	3			4				5	6				7
Parker Size No. (Size Only) (a)	Size Only AS 568A Uniform Dash No.	Nominal Size (Inches) (Ref. Only) I.D.	O.D.	W.	Standard O-Ring Size (Units are in Inches) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	(Ref. Only) Basic Volume Cu. In.	Metric O-Ring Size (Units are in Millimeteres) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	Parker Size No. (Size Only) (a)
2-378	-378	10-1/2	10-7/8	3/16	10.475	.060	.210	.005	1.1627	266,07	1,52	5,33	0,13	2-378
2-379	-379	11	11-3/8	3/16	10.975	.060	.210	.005	1.2171	278,77	1,52	5,33	0,13	2-379
2-380	-380	11-1/2	11-7/8	3/16	11.475	.065	.210	.005	1.2715	291,47	1,65	5,33	0,13	2-380
2-381	-381	12	12-3/8	3/16	11.975	.065	.210	.005	1.3259	304,17	1,65	5,33	0,13	2-381
2-382	-382	13	13-3/8	3/16	12.975	.065	.210	.005	1.4347	329,57	1,65	5,33	0,13	2-382
2-383	-383	14	14-3/8	3/16	13.975	.070	.210	.005	1.5435	354,97	1,78	5,33	0,13	2-383
2-384	-384	15	15-3/8	3/16	14.975	.070	.210	.005	1.6523	380,37	1,78	5,33	0,13	2-384
2-385	-385	16	16-3/8	3/16	15.955	.075	.210	.005	1.7590	405,26	1,91	5,33	0,13	2-385
2-386	-386	17	17-3/8	3/16	16.955	.080	.210	.005	1.8678	430,66	2,03	5,33	0,13	2-386
2-387	-387	18	18-3/8	3/16	17.955	.085	.210	.005	1.9766	456,06	2,16	5,33	0,13	2-387
2-388	-388	19	19-3/8	3/16	18.955	.090	.210	.005	2.0854	481,46	2,29	5,33	0,13	2-388
2-389	-389	20	20-3/8	3/16	19.955	.095	.210	.005	2.1942	506,86	2,41	5,33	0,13	2-389
2-390	-390	21	21-3/8	3/16	20.955	.095	.210	.005	2.3030	532,26	2,41	5,33	0,13	2-390
2-391	-391	22	22-3/8	3/16	21.955	.100	.210	.005	2.4118	557,66	2,54	5,33	0,13	2-391
2-392	-392	23	23-3/8	3/16	22.940	.105	.210	.005	2.5190	582,68	2,67	5,33	0,13	2-392
2-393	-393	24	24-3/8	3/16	23.940	.110	.210	.005	2.6278	608,08	2,79	5,33	0,13	2-393
2-394	-394	25	25-3/8	3/16	24.940	.115	.210	.005	2.7366	633,48	2,92	5,33	0,13	2-394
2-395	-395	26	26-3/8	3/16	25.940	.120	.210	.005	2.8454	658,88	3,05	5,33	0,13	2-395
2-425	-425	4-1/2	5	1/4	4.475	.033	.275	.006	.8863	113,67	0,84	6,99	0,15	2-425
2-426	-426	4-5/8	5-1/8	1/4	4.600	.033	.275	.006	.9097	116,84	0,84	6,99	0,15	2-426
2-427	-427	4-3/4	5-1/4	1/4	4.725	.033	.275	.006	.9330	120,02	0,84	6,99	0,15	2-427
2-428	-428	4-7/8	5-3/8	1/4	4.850	.033	.275	.006	.9563	123,19	0,84	6,99	0,15	2-428
2-429	-429	5	5-1/2	1/4	4.975	.037	.275	.006	.9796	126,37	0,94	6,99	0,15	2-429
2-430	-430	5-1/8	5-5/8	1/4	5.100	.037	.275	.006	1.0030	129,54	0,94	6,99	0,15	2-430
2-431	-431	5-1/4	5-3/4	1/4	5.225	.037	.275	.006	1.0263	132,72	0,94	6,99	0,15	2-431
2-432	-432	5-3/8	5-7/8	1/4	5.350	.037	.275	.006	1.0496	135,89	0,94	6,99	0,15	2-432
2-433	-433	5-1/2	6	1/4	5.475	.037	.275	.006	1.0729	139,07	0,94	6,99	0,15	2-433
2-434	-434	5-5/8	6-1/8	1/4	5.600	.037	.275	.006	1.0963	142,24	0,94	6,99	0,15	2-434
2-435	-435	5-3/4	6-1/4	1/4	5.725	.037	.275	.006	1.1196	145,42	0,94	6,99	0,15	2-435
2-436	-436	5-7/8	6-3/8	1/4	5.850	.037	.275	.006	1.1429	148,59	0,94	6,99	0,15	2-436
2-437	-437	6	6-1/2	1/4	5.975	.037	.275	.006	1.1662	151,77	0,94	6,99	0,15	2-437
2-438	-438	6-1/4	6-3/4	1/4	6.225	.040	.275	.006	1.2129	158,12	1,02	6,99	0,15	2-438
2-439	-439	6-1/2	7	1/4	6.475	.040	.275	.006	1.2595	164,47	1,02	6,99	0,15	2-439
2-440	-440	6-3/4	7-1/4	1/4	6.725	.040	.275	.006	1.3062	170,82	1,02	6,99	0,15	2-440
2-441	-441	7	7-1/2	1/4	6.975	.040	.275	.006	1.3528	177,17	1,02	6,99	0,15	2-441
2-442	-442	7-1/4	7-3/4	1/4	7.225	.045	.275	.006	1.3995	183,52	1,14	6,99	0,15	2-442
2-443	-443	7-1/2	8	1/4	7.475	.045	.275	.006	1.4461	189,87	1,14	6,99	0,15	2-443
2-444	-444	7-3/4	8-1/4	1/4	7.725	.045	.275	.006	1.4928	196,22	1,14	6,99	0,15	2-444
2-445	-445	8	8-1/2	1/4	7.975	.045	.275	.006	1.5394	202,57	1,14	6,99	0,15	2-445
2-446	-446	8-1/2	9	1/4	8.475	.055	.275	.006	1.6327	215,27	1,40	6,99	0,15	2-446

(a) The rubber compound must be added when ordering by the 2-size number (i.e., N0674-70 2-007).
(b) This chart provides dimensions for standard (AN) shrinkage materials ONLY. These correspond to AS568A dimensions. O-rings manufactured out of compounds with different shrinkage rates (other than AN) will produce slightly different dimensions and tolerances. For more information on shrinkage rates, see the Appendix.
(c) When ordering O-rings to a Military, AMS or NAS material Specification, see Section VIII, Specifications, for more information.

.210 Area = .034636
.275 Area = .059396
(sq. in.)

Table 9-1: Parker Series 2-XXX O-Ring Sizes

Parker Hannifin Corporation • O-Ring Division
2360 Palumbo Drive, Lexington, KY 40509
Phone: (859) 269-2351 • Fax: (859) 335-5128
www.parkerorings.com

Parker Series 2-XXX O-Ring Sizes (Continued)

1	2	3			4				5	6				7
Parker Size No. (Size Only) (a)	Size Only AS 568A Uniform Dash No.	Nominal Size (Inches) (Ref. Only) I.D.	O.D.	W.	Standard O-Ring Size (Units are in Inches) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	(Ref. Only) Basic Volume Cu. In.	Metric O-Ring Size (Units are in Millimeteres) Actual (b) Per AS 568A I.D.	Tolerance ±	W	±	Parker Size No. (Size Only) (a)
2-447	-447	9	9-1/2	1/4	8.975	.055	.275	.006	1.7260	227,97	1,40	6,99	0,15	2-447
2-448	-448	9-1/2	10	1/4	9.475	.055	.275	.006	1.8193	240,67	1,40	6,99	0,15	2-448
2-449	-449	10	10-1/2	1/4	9.975	.055	.275	.006	1.9126	253,37	1,40	6,99	0,15	2-449
2-450	-450	10-1/2	11	1/4	10.475	.060	.275	.006	2.0059	266,07	1,52	6,99	0,15	2-450
2-451	-451	11	11-1/2	1/4	10.975	.060	.275	.006	2.0992	278,77	1,52	6,99	0,15	2-451
2-452	-452	11 1/2	12	1/4	11.475	.060	.275	.006	2.1925	291,47	1,52	6,99	0,15	2-452
2-453	-453	12	12-1/2	1/4	11.975	.060	.275	.006	2.2858	304,17	1,52	6,99	0,15	2-453
2-454	-454	12-1/2	13	1/4	12.475	.060	.275	.006	2.3791	316,87	1,52	6,99	0,15	2-454
2-455	-455	13	13-1/2	1/4	12.975	.060	.275	.006	2.4724	329,57	1,52	6,99	0,15	2-455
2-456	-456	13-1/2	14	1/4	13.475	.070	.275	.006	2.5657	342,27	1,78	6,99	0,15	2-456
2-457	-457	14	14-1/2	1/4	13.975	.070	.275	.006	2.6590	354,97	1,78	6,99	0,15	2-457
2-458	-458	14-1/2	15	1/4	14.475	.070	.275	.006	2.7523	367,67	1,78	6,99	0,15	2-458
2-459	-459	15	15-1/2	1/4	14.975	.070	.275	.006	2.8456	380,37	1,78	6,99	0,15	2-459
2-460	-460	15-1/2	16	1/4	15.475	.070	.275	.006	2.9389	393,07	1,78	6,99	0,15	2-460
2-461	-461	16	16-1/2	1/4	15.955	.075	.275	.006	3.0285	405,26	1,91	6,99	0,15	2-461
2-462	-462	16-1/2	17	1/4	16.455	.075	.275	.006	3.1218	417,96	1,91	6,99	0,15	2-462
2-463	-463	17	17-1/2	1/4	16.955	.080	.275	.006	3.2151	430,66	2,03	6,99	0,15	2-463
2-464	-464	17-1/2	18	1/4	17.455	.085	.275	.006	3.3084	443,36	2,16	6,99	0,15	2-464
2-465	-465	18	18-1/2	1/4	17.955	.085	.275	.006	3.4017	456,06	2,16	6,99	0,15	2-465
2-466	-466	18-1/2	19	1/4	18.455	.085	.275	.006	3.4950	468,76	2,16	6,99	0,15	2-466
2-467	-467	19	19-1/2	1/4	18.955	.090	.275	.006	3.5883	481,46	2,29	6,99	0,15	2-467
2-468	-468	19-1/2	20	1/4	19.455	.090	.275	.006	3.6816	494,16	2,29	6,99	0,15	2-468
2-469	-469	20	20-1/2	1/4	19.955	.095	.275	.006	3.7749	506,86	2,41	6,99	0,15	2-469
2-470	-470	21	21-1/2	1/4	20.955	.095	.275	.006	3.9615	532,26	2,41	6,99	0,15	2-470
2-471	-471	22	22-1/2	1/4	21.955	.100	.275	.006	4.1481	557,66	2,54	6,99	0,15	2-471
2-472	-472	23	23-1/2	1/4	22.940	.105	.275	.006	4.3319	582,68	2,67	6,99	0,15	2-472
2-473	-473	24	24-1/2	1/4	23.940	.110	.275	.006	4.5185	608,08	2,79	6,99	0,15	2-473
2-474	-474	25	25-1/2	1/4	24.940	.115	.275	.006	4.7051	633,48	2,92	6,99	0,15	2-474
2-475	-475	26	26-1/2	1/4	25.940	.120	.275	.006	4.8917	658,88	3,05	6,99	0,15	2-475

(a) The rubber compound must be added when ordering by the 2-size number (i.e., N0674-70 2-007).

(b) This chart provides dimensions for standard (AN) shrinkage materials ONLY. These correspond to AS568A dimensions. O-rings manufactured out of compounds with different shrinkage rates (other than AN) will produce slightly different dimensions and tolerances. For more information on shrinkage rates, see the Appendix.

(c) When ordering O-rings to a Military, AMS or NAS material Specification, see Section VIII, Specifications, for more information.

.275 Area = .059396 (sq. in.)

Table 9-1: Parker Series 2-XXX O-Ring Sizes

Parker Hannifin Corporation • O-Ring Division
2360 Palumbo Drive, Lexington, KY 40509
Phone: (859) 269-2351 • Fax: (859) 335-5128
www.parkerorings.com

Parker Series 3-XXX O-Ring Sizes

These O-rings are intended for use with internal straight thread fluid connection bosses and tube fittings. Ref. MS33656, MS33657, SAE straight thread O-ring boss and mating swivel and adjustment style fittings.

1	2	3	4	5	6		7	8	9	10		11
			O-Ring Size – Actual (b) per AS568A (Units are in Inches)					Metric O-Ring Size per AS568A (b) (Units are in Millimeters)				
3-XXX (a) Size No.	AS568A Dash No.	Tube O.D. (Ref.)	I.D.	Tolerance ±	W	±	Basic Volume Cu. In.	I.D.	Toler-ance ±	W	±	3-XXX (a) Size No.
3-901	-901	3/32	.185	.005	.056	.003	.0019	4,70	0,13	1,42	0,08	3-901
3 -902	-902	1/8	.239	.005	.064	.003	.0031	6,07	0,13	1,63	0,08	3-902
3-903	-903	3/16	.301	.005	.064	.003	.0037	7,65	0,13	1,63	0,08	3-903
3-904	-904	1/4	.351	.005	.072	.003	.0055	8,92	0,13	1,83	0,08	3-904
3-905	-905	5/16	.414	.005	.072	.003	.0063	10,52	0,13	1,83	0,08	3-905
3-906	-906	3/8	.468	.005	.078	.003	.0082	11,89	0,13	1,98	0,08	3-906
3-907	-907	7/16	.530	.007	.082	.003	.0102	13,46	0,18	2,08	0,08	3-907
3-908	-908	1/2	.644	.009	.087	.003	.0137	16,36	0,23	2,21	0,08	3-908
3-909	-909	9/16	.706	.009	.097	.003	.0187	17,93	0,23	2,46	0,08	3-909
3-910	-910	5/8	.755	.009	.097	.003	.0198	19,18	0,23	2,46	0,08	3-910
3-911	-911	11/16	.863	.009	.116	.004	.0326	21,92	0,23	2,95	0,10	3-911
3-912	-912	3/4	.924	.009	.116	.004	.0346	23,47	0,23	2,95	0,10	3-912
3-913	-913	13/16	.986	.010	.116	.004	.0366	25,04	0,26	2,95	0,10	3-913
3-914	-914	7/8	1.047	.010	.116	.004	.0387	26,59	0,26	2,95	0,10	3-914
3-916	-916	1	1.171	.010	.116	.004	.0428	29,74	0,26	2,95	0,10	3-916
3-918	-918	1-1/8	1.355	.012	.116	.004	.0489	34,42	0,30	2,95	0,10	3-918
3-920	-920	1-1/4	1.475	.014	.118	.004	.0548	37,47	0,36	3,00	0,10	3-920
3-924	-924	1-1/2	1.720	.014	.118	.004	.0632	43,69	0,36	3,00	0,10	3-924
3-928	-928	1-3/4	2.090	.018	.118	.004	.0759	53,09	0,46	3,00	0,10	3-928
3-932	-932	2	2.337	.018	.118	.004	.0844	59,36	0,46	3,00	0,10	3-932

(a) The rubber compound must be added when ordering by the 3-size number (i.e., N552-90 3-910).
(b) This chart provides dimensions for standard (AN) shrinkage materials ONLY. These correspond to AS568A dimensions. O-rings manufactured out of compounds with different shrinkage rates (other than AN) will produce slightly different dimensions andtolerances. For more information on shrinkage rates, see the Appendix.

Table 9-2: Parker Series 3-XXX O-Rings Sizes

.056 Area = .00246
.064 Area = .00322
.072 Area = .00407
.078 Area = .00478
.082 Area = .00528
.087 Area = .00594
.097 Area = .00739
.116 Area = .01057
.118 Area = .01094
(sq. in.)

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Parker O-Ring Compound Numbering Systems

Note: There are two types of nomenclature used to reference Parker O-Ring products. See tables below for description of these types.

TYPE I		
N	0674	-70
Polymer Code (Single Letter)	Sequence Number (four digits)	Durometer Indicator (two digits)

TYPE II			
A	A	150	-70
Polymer Code (Single Letter)	Special Property Description (Single Letter)	Sequence Number (three digits)	Durometer Indicator (two digits)

Polymer Codes

A Polyacrylate	F Parofluor ULTRA™	P Polyurethane
B Butyl	H Hifluor™	S Silicone
C Chloroprene (Neoprene®)	K HNBR	V Fluorocarbon, AFLAS®, Hifluor™, Parofluor™
E Ethylene Propylene	L Fluorosilicone	
	N Nitrile (Buna N) and HNBR	Z Exotic Polymers

Special Property Descriptions

A	General Purpose
B	Low Compression Set
E	Ethylene Acrylate or (Vamac®)
F	Fuel Resistant or Fully Fluorinated
G	Higher Fluorine Content
J	NSF / FDA / WRAS Approvals
L	Internally Lubed
M	Mil/ AMS Specifications
P	Low Temperature Flexible or (AFLAS)
W	Non-Black Compound
X	Carboxylated

Durometer Indicators (Hardness)

-40	40 ±5	Shore A Durometer
-45	45 ±5	Shore A Durometer
-50	50 ±5	Shore A Durometer
-55	55 ±5	Shore A Durometer
-60	60 ±5	Shore A Durometer
-65	65 ±5	Shore A Durometer
-70	70 ±5	Shore A Durometer
-75	75 ±5	Shore A Durometer
-80	80 ±5	Shore A Durometer
-85	85 ±5	Shore A Durometer
-90	90 ±5	Shore A Durometer
-95	95 ±5	Shore A Durometer

AFLAS® is a registered trademark of Asahi Glass Co., Ltd.
Vamac® is a registered trademark of E.I. du Pont de Nemours & Co.
Neoprene® is a registered trademark of DuPont Performance Elastomers

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POLYACRYLATE (ACM)

ACM (acrylic rubber) has good resistance to mineral oil, oxygen and ozone. The water compatibility and cold flexibility of ACM are considerably worse than with NBR.

COMPOUND NO.	RECOMMENDED FOR	TEMP. RANGE (Degrees° F)	COLOR
AA150-70 (12307)	Engines & Transmissions	-5 to 350	Black
AA154-75 (12358)	Engines & Transmissions	-5 to 350	Black

ETHYLENE ACRYLATE (AEM)

Ethylene acrylate is a mixed polymer of ethylene, methyl acrylate and a small amount of carboxylated cure-site monomer. Developed as a lower-temperature version of Polyacrylate, but swells slightly more. Polymer is sold under the tradename VAMAC®.

AE152-70 (12897)	Transmissions	-40 to 325	Black
AE153-75 (12917)	Transmissions, Internally Lubed	-40 to 325	Black
AE154-75 (12867)	Vamac, Transmission Applications	-40 to 325	Black

BUTYL RUBBER (IIR)

Butyl rubber (isobutylene-isoprene rubber or IIR) has a very low permeability rate and good electrical properties, but poor short-term rebound.

B0318-70	AMS 3238	-75 to 250	Black
B0612-70	Vacuum, General Purpose	-75 to 250	Black
B1167-80	Vacuum, General Purpose	-75 to 250	Black

POLYCHLOROPRENE RUBBER (CR)

Also known by the tradename Neoprene®, polychloroprene was the first synthetic rubber and exhibits generally good ozone, aging, and chemical resistance. It has good mechanical properties over a wide temperature range.

C0267-50	MIL-G-1149 Ty I Cl I AMS 3208, Low Temp.	-60 to 250	Black
C0557-70	Drive Belt Applications	-35 to 250	Black
C0873-70	General Purpose	-35 to 225	Black
C0944-70	General Purpose	-35 to 250	Red
C1124-70	AMS 3209, Low Temp.	-60 to 250	Black
C1276-70	Low Compression Set	-35 to 250	Black
CL172-70 (2347)	Internally Lubed	-35 to 225	Black
C1278-80	Low Compression Set	-35 to 250	Black
CB173-80 (2598)	Good Retained Resilience	-35 to 250	Black

ETHYLENE PROPYLENE RUBBER (EPM, EPR, EPDM)

EPM (EPR) is a copolymer of ethylene and propylene. EPDM is a terpolymer of ethylene, propylene, and a diene third monomer used for cross-linking.

E1100-50	General Purpose	-70 to 250	Black
EA454-50 (3575)	UL Listed	-70 to 250	Black
E1157-60	General Purpose	-70 to 250	Black
E1561-60	NSF 61, KTW, WRAS	-70 to 250	Black
E0751-65	Drive Belt Applications	-70 to 250	Black
E0603-70	General Purpose	-70 to 250	Black
E0667-70	Auto Disc Brakes	-70 to 250	Black
E0803-70	General Purpose	-70 to 250	Black
E1022-70	Internally Lubed, Brakes	-70 to 250	Black
E1028-70	FDA	-70 to 250	Black
E1244-70	NSF 61, Internally Lubed	-70 to 250	Black
E1257-70	Chloramine Resistant, NSF 61	-70 to 250	Black
E1512-70	Chloramine Resistant, NSF 61, Internally Lubed	-70 to 250	Black
E1514-70	Chloramine Resistant	-70 to 250	Black
E1549-70	NSF 61, WRAS, KTW, FDA	-70 to 250	Black
E1570-70	NSF 61, Internally Lubed	-70 to 250	Black
E1571-70	NSF 61	-70 to 250	Black
E1583-70	NSF 51, NSF 61, Internally Lubed	-70 to 250	Black
E3609-70	NSF 51, NSF 61, WRAS, KTW, FDA, USP Class VI	-70 to 250	Black
EB152-70 (3407)	General Purpose	-70 to 250	Black
EJ273-70	Chloramine Resistant	-70 to 250	Black
EJ274-70	Internally lubed, NSF 61 Chloramine Resistant	-70 to 250	Black
EJ280-70	USP VI, FDA, Animal-Free	-70 to 250	Black
E0692-75	Steam, High Temp. Water	-70 to 250	Black
E0740-75	Nuclear Applications	-70 to 250	Black
E0515-80	NAS 1613 Rev 2	-70 to 250	Black
E0540-80	General Purpose	-70 to 250	Black
E0893-80	General Purpose	-70 to 250	Purple
E1267-80	NAS 1613 Rev 5	-70 to 250	Black
E0652-90	General Purpose, Back-Up Rings	-60 to 250	Black
E0962-90	Excellent Steam to 500° F, ED Resistant	-60 to 250	Black

Note: Compound numbers in (XXXXX) are the obsolete Wynn's Precision compound numbering system.

FLUOROSILICONE (FVMQ)

Fluorosilicone is a silicone polymer chains with fluorinated side-chains for improved oil and fuel resistance. The mechanical and physical properties are very similar to those of silicone.

LM151-50 (11645)	General Purpose	-100 to 350	Blue
LM152-60 (11646)	General Purpose	-100 to 350	Blue
LM158-60	AMS-R-25988, TY 1, CL 1, GR 60, AMS 3325	-100 to 350	Blue
LM153-70 (11647)	General Purpose	-100 to 350	Blue
LM159-70	AMS-R-25988, TY 1, CL 1, GR 70	-100 to 350	Blue
L1120-70	AMS-R-25988, TY I, CL I, GR 70, UL listed	-100 to 350	Blue
LM161-70 (11847)	General Purpose	-100 to 350	Blue
L1077-75	AMS-R-25988, TY I, CL III, GR 75	-90 to 350	Blue
LM155-80 (11648)	General Purpose	-90 to 350	Blue
LM160-80	AMS-R-25988, TY 1, CL 1, GR 80	-90 to 350	Blue
L1218-80	AMS-R-25988, TY I, CL I, GR 80	-90 to 350	Blue
L1186-80	PTFE Loaded	-85 to 350	Rust

ACRYLONITRILE-BUTADIENE (NBR)

Nitrile rubber (NBR) is the general term for acrylonitrile-butadiene terpolymer. The acrylonitrile content of nitrile sealing compounds varies considerably (18 to 50%.) Polymers with higher ACN content exhibit less swell in gasoline and aromatic solvents, while lower ACN polymers exhibit better compression set and low temperature flexibility. Polymer is also called Buna-N.

N0545-40	AMS 3201	-45 to 225	Black
N0299-50	AMS 3205, UL listed	-55 to 225	Black
NL151-50 (8315)	Internally Lubed	-55 to 225	Black
N0406-60	General Purpose	-40 to 225	Black
N0525-60	AMS 3212, AMS 3220	-25 to 250	Black
N1219-60	NSF 51, FDA	-30 to 225	Black
NF284-60 (1053)	Fuel Resistant	-25 to 250	Black
NF162-65 (1106)	Fuel Resistant	-25 to 250	Black
NM506-65	AMS 7271	-70 to 180	Black
NX352-70 (7727)	Carboxylated	-25 to 250	Black
NJ253-70 (7077)	FDA	-35 to 212	Black
NF153-70 (7657)	Fuel Resistant, UL Listed SAE 120R1 Class II	-70 to 180	Black
NA151-70 (8307)	General Purpose	-30 to 250	Black
NL153-70 (8317)	Internally Lubed	-30 to 250	Black
47-071	AMS-R-7362	-60 to 180	Black
N0103-70	Low Temp.	-55 to 225	Black

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COMPOUND NO.	RECOMMENDED FOR	TEMP. RANGE (Degrees° F)	COLOR
N0287-70	Synthetic Lubricant Resistant, AMS 7272	-35 to 250	Black
N0497-70	Low Swell, SAE 120R1 CL ll UL listed	-35 to 212	Black
N0602-70	General Purpose, AMS-P-5315, Low Temp.	-70 to 180	Black
N0674-70	General Purpose MIL-G-21569, Cl I, UL listed	-30 to 250	Black
N0757-70	NSF 61, UL Listed	-30 to 225	Black
N0818-70	Internally Lubed	-30 to 250	Black
N0828-70	Internally Lubed, Low Set	-30 to 225	Black
N1069-70	FDA	-30 to 180	Black
N1220-70	NSF 51, FDA	-30 to 225	Black
N1470-70	General Purpose	-40 to 225	Black
N1499-70	General Purpose, UL	-30 to 250	Black
N1510-70	NSF 61	-30 to 225	Black
N1517-70	NSF 61	-30 to 225	Black
N1527-70	UL Listed	-30 to 225	Black
NW163-75 (40601)	Internally Lubed	-30 to 225	Rust
NM156-75 (7377)	Good Low Temp.	-65 to 225/250	Black
N0304-75	MIL-P-25732	-65 to 225/250	Black
N0508-75	FDA, USDA	-30 to 180	Black
N0756-75	AMS-P-83461	-65 to 250/275	Black
N0951-75	High Temp, Low Compression Set	-25 to 275	Black
N1500-75	Low Swell, UL Listed, Fuel applications	-35 to 212	Black
N1565-75	UL Listed	-30 to 225	Black
N1591-75	UL Listed	-30 to 225	Black
NA155-80 (7538)	Abrasion Resistant	-25 to 250	Black
N0750-80	Carboxylated	-25 to 250	Black
N1090-85	"ELF" Pneumatic, Carboxylated	-25 to 225	Black
NB107-90 (1929)	Extrusion Resistant	-25 to 225	Black
N0300-90	Back Up Rings	-40 to 180	Black
N0507-90	AMS-P-5510, Low Temp.	-65 to 180	Black
N0552-90	General Purpose	-30 to 250	Black
N0702-90	Low Compression Set	-30 to 275	Black
N1059-90	Low Compression Set	-30 to 275	Black
N1444-90	Parbaks only	-30 to 250	Black
N1490-90	General Purpose	-30 to 250	Black
NB194-90	Low Extrusion Set, Extrusion Resistant	-30 to 250	Black

HYDROGENATED NITRILE (HNBR, HSN)

Hydrogenated nitrile was developed as an air-resistant variant of nitrile rubber. In HNBR, the carbon-carbon double bonds in the main polymer chain are saturated with hydrogen atoms in a process called "hydrogenation" that improves the material's thermal stability and oxidation resistance.

KB190-50 (21705)	Automotive Applications	-25 to 300/325	Black
KA170-55 (21105)	UL Listed	-25 to 300/325	Black
KB181-60 (21926)	Diesel Applications	-25 to 300/325	Black
N1173-70	General Purpose	-25 to 300/325	Black
N1195-70	Refrigerants	-25 to 300/325	Green
N1206-70	Low Temp.	-40 to 300/325	Green
N1239-70	Refrigerants	-25 to 300/325	Red
KA157-70 (21407)	General Purpose	-30 to 300/325	Black
KB161-70 (21377)	High Temp. Hydraulics	-25 to 300/325	Black
KA174-75 (21107)	75 Duro, General Purpose	-25 to 300/325	Black
N1231-80	Explosive Decompression	-25 to 300/325	Black
KA453-80 (21508)	Low Swell, ED Resistant	-25 to 300/325	Black
KB162-80 (21378)	High Temp. Hydraulics	-25 to 300/325	Black
KA183-85	Low Temp.	-55 to 300/320	Black
KB163-90 (21379)	High Temp. Hydraulics	-25 to 300/325	Black

Note: Compound numbers in (XXXXX) are the obsolete Wynn's Precision compound numbering system.

COMPOUND NO.	RECOMMENDED FOR	TEMP. RANGE (Degrees° F)	COLOR
	ED Resistant		
N4007-95	Extrusion Resistant, ED Resistant	-25 to 300/325	Black

POLYURETHANE (AU, EU)

Polyurethane elastomers have excellent wear resistance, high tensile strength and high elasticity in comparison with any other elastomers. Permeability is good and comparable with butyl. Millable urethanes should not be confused with thermoplastic urethanes, which are generally harder, less flexible, and have slightly better wear resistance.

P0642-70	Drive Belt Applications, Millable Type	-40 to 180	Black

SILICONE RUBBER (VMQ, PVMQ)

Silicones possess good insulating properties and tends to be physiologically neutral. However, silicone elastomers have relatively low tensile strength, poor tear and wear resistance.

S0469-40	AMS 3301	-75 to 400	Rust
S0802-40	FDA	-60 to 400	White
S0595-50	AMS 3302	-70 to 400	Rust
S0899-50	ZZ-R-765 CL 1a, 1b, 2a, 2b GR 50	-103 to 400	Rust
SM151-50 (11355)	UL	-70 to 400	Rust
S1538-55	FDA, USP CL VI	-60 to 450	Trans
S0317-60	FDA, USDA, USP CL VI	-103 to 450	Rust
S0613-60	ZZ-R-765 Cl 2b, Gr 60, AMS 3303	-60 to 450	Rust
SM152-60 (11356)	UL	-60 to 450	Rust
S0383-70	ZZ-R-765 Cl 1a, 1b, Gr 70, AMS 3337	-175 to 400	Rust
S0455-70	High Temp.	-65 to 450/500	Rust
S0604-70	ZZ-R-765 Cl 2a, 2b, Gr 70 AMS 3304, AMS 3357 MIL-G-21569	-65 to 450	Rust
S1138-70	FDA	-60 to 400	Rust
S1224-70	ZZ-R-765 Cl 2a, 2b, Gr 70 AMS 3304, AMS 3357 MIL-G-21569	-65 to 450	Rust
SM153-70 (11357)	UL Listed	-60 to 450	Rust
S0355-75	AMS 7267, FDA, USDA	-60 to 450	Rust
S0614-80	ZZ-R-765 Cl 2a, 2b Gr 80, AMS 3305	-65 to 450	Rust

FLUOROCARBON (FKM, FPM)

Fluorocarbon (FKM) has excellent resistance to high temperature and a broad range of chemicals. Permeability and compression set are excellent.

V0986-50	General Purpose	-15 to 400	Brown
V0763-60	General Purpose	-15 to 400	Brown
V0769-60	General Purpose	-15 to 400	Black
VA150-65 (19356)	General Purpose	-15 to 400	Black
V1262-65	Low Swell - Flex Fuel Blends UL listed	-15 to 400	Black
VW252-65	Low Swell	-15 to 400	Green
V0680-70	FDA, USDA, NSF 51	-15 to 400	Red
VB185-70	Acid Resistant	-15 to 400	Black
V1033-70	General Purpose	-15 to 400	White
V0747-75	AMS-R-83248, TY I, CL I, UL listed	-15 to 400	Black
V0848-75	PTFE Loaded	-15 to 400	Black
V0884-75	General Purpose, UL listed	-15 to 400	Brown
V1163-75	"GFLT Type", UL listed, E85	-35 to 400	Black
V1164-75	Low Set, AMS 7276, AMS-R-83248, TY I, CL I	-15 to 400	Black
V1226-75	Low Set, AMS 7276, UL listed, AMS-R-83248, TY I, CL I	-15 to 400	Brown

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COMPOUND NO.	RECOMMENDED FOR	TEMP. RANGE (Degrees° F)	COLOR
V1260-75	Very Chemically Resistant "Viton Extreme" Type	-15 to 400	Black
V1263-75	Low Swell - Flex Fuel Blends UL listed, E85	-15 to 400	Black
V1274-80	No Metal Oxides "GF" Type, Low Swell, Steam, USP VI	-15 to 400	Black
V1289-75	Low Temp.	-50 to 400	Black
VA203-75 (16737)	Extrusion Resistant, Diesel Fuel Injectors	-15 to 400	Black
VB153-75 (19717)	Good Compression Set, Fuels	-15 to 400	Black
VG162-75 (19727)	Good Fuel Resistance	-15 to 400	Black
VW153-75 (16207)	General Purpose	-15 to 400	Brown
VW173-75 (19457)	Automotive Applications	-15 to 400	Green
V1436-75	General Purpose, UL Listed	-15 to 400	Black
V1475-75	General Purpose	-15 to 400	Black
V1476-75	General Purpose	-15 to 400	Brown
VA151-75 (19357)	General Purpose, UL	-15 to 400	Black
VM835-75	AMS-R-83485, "GLT Type"	-40 to 400	Black
VA163-80 (19318)	Internally Lubed	-15 to 400	Black
VP104-85	Sour Gas Resistant	+10 to +400	Black
V0709-90	AMS-R-83248, TY I, Cl II AMS 7259	-15 to 400	Black
V0894-90	General Purpose	-15 to 400	Brown
V1411-90	General Purpose	-15 to 400	Black
V1412-90	General Purpose	-15 to 400	Brown
VA153-90 (19359)	General Purpose	-15 to 400	Black
VW155-90 (16129)	General Purpose	-15 to 400	Green
V1238-95	Extrusion Resistant, Explosive Decompression Resistant	-15 to 400	Black
VA154-95 (16949)	Extrusion Resistant	-15 to 400	Black

TETRAFLUOROETHYLENE - PROPYLENE (AFLAS)

This material is a copolymer of TFE and propylene. Its chemical resistance is excellent across a wide range of aggressive media. Polymer is sold under the tradename Aflas®.

V1006-75	AMS 7255	25 to 450	Black
VP101-80 (20018)	General Purpose	25 to 450	Black
VP102-80	Good Compression Set Resistance	15 to 450	Black
V1041-85	ED Resistant	15 to 450	Black
VP103-90 (20019)	Sour Service	25 to 450	Black

HIGHLY FLUORINATED ELASTOMER (HiFluor)

Hifluor is Parker's tradename for high performance fluoroelastomers – materials that "bridge the gap" between traditional fluorocarbon and perfluoroelastomer.

V3819-75	Chemically Resistant, Low Compression Set	-15 to 400	Black
V8534-90	Chemically Resistant, Extrusion Resistant	-15 to 400	Black

COMPOUND NO.	RECOMMENDED FOR	TEMP. RANGE (Degrees° F)	COLOR

PERFLUOROELASTOMER (Parofluor)

Perfluoroelastomer is a rubber version of PTFE. Available from Parker under the tradenames Parofluor™ and Parofluor ULTRA™.

V1266-65	Plasma, Low Closure Force	5 to 572	White
V8545-75	AMS 7257, High Temp., FDA	5 to 572	Black
V8562-75	Low Leachables, FDA	5 to 572	White
V8581-90	Plasma, Low Outgassing	5 to 572	White
V8588-90	Chemically Resistant, Extrusion & ED Resistant	5 to 572	Black

PERFLUOROELASTOMER (Parofluor ULTRA)

Perfluoroelastomer is a rubber version of PTFE. Available from Parker under the tradenames Parofluor™ and Parofluor ULTRA™.

FF354-65	Low Closure Force	5 to 608	White
FF102-75	Acid Resistant	5 to 525	Black
FF200-75	Low Comp Set, AMS7257 FDA	5 to 608	Black
FF350-75	Plasma, High Purity, FDA USP Class VI	5 to 608	White
FF352-75	General Purpose, Clean	5 to 608	White
FF370-75	Thermal Etch, Plasma, Low Extractables, and Low particle generation	5 to 608	Opaque Black
FF500-75	Broad Chemical Resistance, FDA	5 to 525	Black
FF202-90	Extrusion Resistant, Low Compression Set	5 to 608	Black

Note: Compound numbers in (XXXXX) are the obsolete Wynn's Precision compound numbering system.

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NOTES

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