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Rubber Compounds

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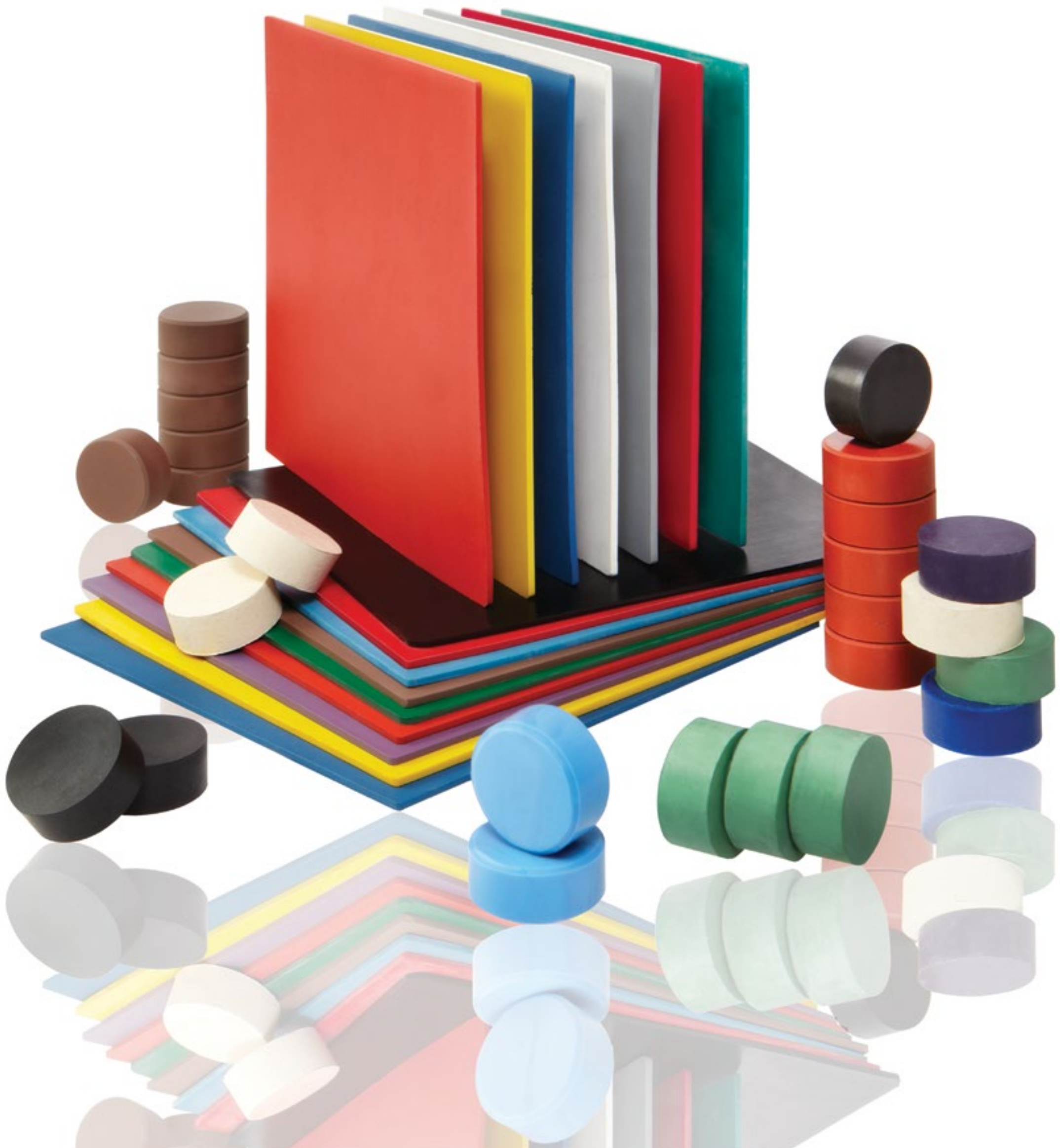
Rubber Compounds



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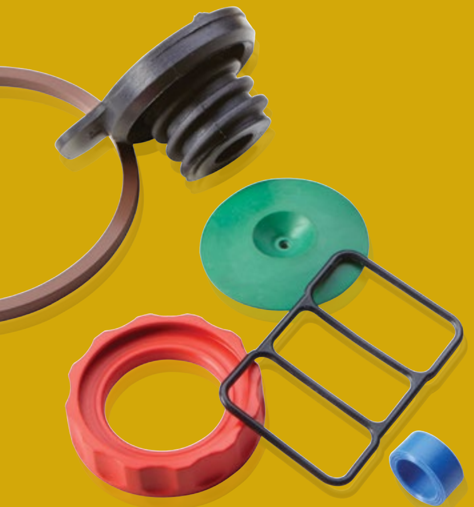

Where rubber compounds abound.

Why make the rounds searching for rubber compounds when they're all right here in one convenient place? All Seals has developed nearly 500 different rubber compounds, in a variety of materials and hardnesses, to satisfy virtually every conceivable requirement. And if your application requires unique properties and/or capabilities, we'll develop a compound for you!

This brochure describes the most commonly specified rubber compounds. As such, the information presented here is necessarily general in nature and abbreviated. For more specific information or expert advice, contact us and speak directly to an experienced compound professional. Please call us at 800.553.5054, or visit our website at www.allsealsinc.com.

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AFLAS®
(TFE/P, FEPM)

Aflas® or TFE/P is a member of a recent generation of fluoroelastomers formulated specially to provide unique properties for specific applications. The primary uses for Aflas® are in the oil/gas, chemical processing, pharmaceutical and automotive industries. It can be crosslinked (cured) using a variety of systems, but generally peroxides are used to provide the best all-around environmental resistance. A unique property of TFE/P is, that at very low temperatures (down to -65°F), it takes on leathery consistency and remains functional, unlike many other rubbers, which can often become brittle and shatter.

Composition:
Medium density copolymer of tetrafluoroethylene and propylene.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength			•	
Elongation		•		
Cold resistance	•			
Compression set		•		
Tear resistance		•		
Abrasion resistance				•
Flame resistance				•
Gas permeability			•	

Chemical Resistance:*	Poor	Fair	Good	Excellent
Concentrated bases				•
Dilute acids and bases				•
Ozone				•
Weather				•
Steam			•	
Radiation			•	
Phophate esters			•	
Oxidation			•	
Sour Oil & Gas			•	
Ethers	•			
Alipathic hydrocarbons		•		
Aromatic hyrdrocarbons	•			
Ketones	•			

Operating Temperature:**
+15° to +400°F

BUTYL RUBBER
(IIR)

Butyl is a specialty rubber more frequently specified for its physical properties than chemical resistance. It has excellent shock absorption and vibration damping capabilities, as well as good electrical properties. Butyl's unusually low gas permeability makes it ideal for vacuum applications, while its high degree of saturation makes it inherently resistant to atmospheric elements such as ozone and UV radiation. Additionally, butyl is thermally stable when cured with phenol-formaldehyde resins, and has a relatively high coefficient of friction.

Composition:
Medium density copolymer of isobutylene and a small amount of isoprene.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength			•	
Elongation			•	
Cold resistance				•
Compression set			•	
Tear resistance			•	
Abrasion resistance			•	
Flame resistance	•			
Gas permeability				•

Chemical Resistance:*	Poor	Fair	Good	Excellent
Ozone				•
Weather				•
Ketones			•	
Silicone fluids			•	
Petroleum oils and fuels	•			

Operating Temperature:**
-65° to +250°F

CARBOXYLATED NITRILE
(XNBR)

Carboxylated nitrile, or XNBR, is produced by adding a carboxylic acid side group to nitrile rubber, thereby adding more crosslinking sites than traditional NBR. As a result, solvent swell and abrasion resistance are significantly improved, as well as modulus, tensile strength and tear resistance. Accordingly, XNBR is frequently specified in dynamic applications such as rod seals and wipers. Water resistance, resilience and some low temperature properties are somewhat diminished.

Composition:
Medium density terpolymer of acrylonitrile, butadiene, and a diene monomer containing carboxylic acid..

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength				•
Elongation			•	
Cold resistance		•		
Compression set		•		
Tear resistance			•	
Abrasion resistance				•
Flame resistance	•			
Gas permeability			•	

Chemical Resistance:*	Poor	Fair	Good	Excellent
Petroleum oils and fuels				•
Silicone lubricants				•
LP Gas				•
Solvents			•	
Oxidation			•	
Dilute acids and bases			•	
Water		•		
Steam		•		
Weather		•		
Amines	•			
Esters	•			
Ethers	•			

Operating Temperature:**
-10° to +250°F

CHLOROPRENE RUBBER

(CR, polychloroprene, Neoprene)

Chloroprene (commonly known as "neoprene") is one of the oldest synthetic elastomers. Introduced in 1931, it is used in a variety of applications due to its ability to resist both oils and oxidation. The oil resistance, however, depends significantly on the type of oil. Neoprene has good resistance to naphthenic and paraffinic oils of high molecular weight, but swells excessively in aromatic oils of low molecular weight. Vulcanizates of neoprene display little significant change after prolonged outdoor exposure. Because of its chlorine content, flame resistance is superior to that of most other rubbers, and its high structural regularity displays strain induced crystallization resulting in high tensile strength. Neoprene is also especially well-suited for rubber-to-metal bonding

Composition:

Produced from the chloroprene monomer, a combination of chlorine and butadiene. Medium density.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength			•	
Elongation			•	
Cold resistance			•	
Compression set			•	
Tear resistance		•		
Abrasion resistance				•
Flame resistance			•	
Gas permeability			•	

Chemical Resistance:*	Poor	Fair	Good	Excellent
Ozone				•
Weather				•
Dilute acids			•	
Dilute alkalis			•	
Refrigerants			•	
Water			•	
Steam		•		
Aromatic & oxygenated solvents	•			

Operating Temperature:**

-40° to +225°F

ETHYLENE ACRYLIC RUBBER

(AEM, Vamac®)

Ethylene acrylic, or AEM rubber is generally used in applications requiring a tough rubber that combines good oil resistance, with heat resistance greater than nitrile or neoprene, and at a cost well below that of many silicone or fluorocarbon rubbers. Good low temperature properties are imparted by the ethylene content, while the acrylate provides a considerable degree of oil resistance. Ethylene acrylic rubber is highly saturated, and as a result exhibits excellent resistance to ozone and weathering. Ethylene acrylic compounds are also well suited for applications requiring continuous exposure to hot (300°F) aliphatic hydrocarbons, including most common automotive lubricants and hydraulic fluids. Water and ethylene glycol resistance is good, but softening can occur after long term exposure above 200°F. AEM's good damping characteristics make it well suited for vibration mounts, pads, and isolators.

Composition:

Medium density copolymer of ethylene and methyl acrylate. May also contain a small amount of a third monomer containing carboxylic acid to provide active cure sites in the polymer chain.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength			•	
Elongation		•		
Cold resistance			•	
Compression set			•	
Tear resistance		•		
Abrasion resistance		•		
Flame resistance	•			
Gas permeability				•

Chemical Resistance:*	Poor	Fair	Good	Excellent
Ozone				•
Weather				•
Petroleum oils			•	
Automatic transmission fluid			•	
Water		•		
Dilute acids		•		
Dilute alkalis		•		
Steam	•			

Operating Temperature:**

-30° to +300°F

ETHYLENE PROPYLENE RUBBER

(EPDM, EPT, Nordel IP®, Keltan®)

Ethylene-Propylene rubber is a low cost, versatile compound that functions well in both low and high operating temperature environments. Moderate to good resistance to a variety of chemicals make it the compound of choice for a variety of applications. EPDM's chemically saturated polymer chain accounts for its superior resistance to degradation. However, use is limited by its incompatibility with petroleum based fluids. EPDM can be cured with sulfur or peroxide, although applications with high heat requirements should use peroxide cured compounds. Peroxide curing also produces vulcanizates with superior compression set than that of the sulfur cures. Reinforcing agents are especially important in ethylene-propylene polymers because they lack gum strength. Therefore, high tensile and tear properties are achieved through high loading. EPDM is a terpolymer, not to be confused with the copolymer EPM, which can only be peroxide cured, due to its highly saturated polymer backbone.

Composition:

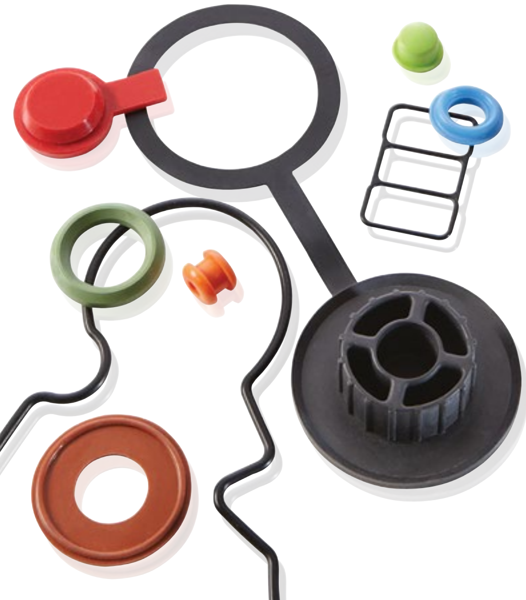
Low density terpolymer of ethylene, propylene, and a small amount of a diene.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength			•	
Elongation			•	
Cold resistance				•
Compression set			•	
Tear resistance			•	
Abrasion resistance			•	
Flame resistance			•	
Gas permeability				•

Chemical Resistance:*	Poor	Fair	Good	Excellent
Ozone			•	
Weather			•	
Water			•	
Steam			•	
Dilute acids			•	
Dilute alkalis			•	
Oxygenated solvents		•		
Alcohols		•		
Gasoline	•			
Petroleum oils and greases	•			

Operating Temperature:**

-60° to +250°F



FLUOROCARBON RUBBER

(FKM, FPM, Viton™, Dai-El®, Tecnoflon®)

Fluorocarbon (or FKM) rubber is a widely used, premium grade compound especially well suited to applications where prolonged exposure to petroleum oils at high operating temperatures is encountered. Such properties make it especially useful in automotive "under-hood"applications. Additionally FKM is particularly resistant to swell in the highly aromatic, non-leaded, additive loaded gasoline mandated by today's environmental regulations. Its low temperature deficiencies can be overcome somewhat by special compounding. Fluorine content is generally in the 66% to 70% range. Fluorocarbon rubber is exceptionally resistant to embrittlement when exposed to high heat over long periods of time; it is considered to be serviceable indefinitely when exposed continuously to 400°F dry heat. The cure system of choice for most fluorocarbon compounds is bisphenol, as it provides the best combination of compression set and improved steam and acid resistance. Diamine and peroxide cure systems can also be employed. Fluorocarbon vulcanizates are very resistant to ozone and atmospheric aging.

Composition:

High density copolymer of vinylidene and hexafluoropropylene.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength			•	
Elongation		•		
Cold resistance	•			
Compression set				•
Tear resistance		•		
Abrasion resistance			•	
Flame resistance				•
Gas permeability			•	

Chemical Resistance:*	Poor	Fair	Good	Excellent
Ozone				•
Weather				•
Water			•	
Dilute acids				•
Dilute alkalis				•
Petroleum oils				•
Solvents			•	
Steam		•		
Ketones		•		
Anhydrous ammonia	•			

Operating Temperature:**

-15° to +400°F

FLUOROSILICONE RUBBER

(FVMQ, Silastic FSR®, FSE®)

Fluorosilicone rubber is an inorganic "hybrid" elastomer which combines the wide temperature range spectrum of silicone with some of the chemical resistance of fluorocarbon rubber, accomplished by the addition of fluorine to the alkyl groups of silicone elastomers. Primary use is in fuel delivery systems. Fluorosilicone rubber offers the best low temperature properties of any oil resistant rubber. Like all compounds based on silicone rubber, fluorosilicones have relatively low tear strength, abrasion resistance, and tensile strength, and therefore are generally not suitable for dynamic applications.

Composition:

Low density fluorinated silicone rubber.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength		•		
Elongation		•		
Cold resistance				•
Compression set			•	
Tear resistance	•			
Abrasion resistance	•			
Flame resistance			•	
Gas permeability	•			

Chemical Resistance:*	Poor	Fair	Good	Excellent
Ozone				•
Weather				•
Water				•
Dilute acids				•
Dilute alkalis				•
Silicone oils				•
Hydrocarbon fuels				•
Petroleum oils				•
Refrigerants		•		
Steam		•		
Ketones	•			

Operating Temperature:**

-70° to +400°F

HIGHLY SATURATED NITRILE

(HNBR, HSN, NBM, Therban®, Zetpol®)

Hydrogenation of nitrile rubber removes much of the unsaturation in the nitrile polymer chain to make it far less vulnerable to attack by heat, ozone, and oxygen. In fact, due to superior oil and temperature resistance, highly saturated nitrile can sometimes be substituted for more costly fluorocarbon rubber. It is frequently used in automotive air conditioning systems employing R-134a refrigerants. HNBR can be can be either peroxide or sulfur cured, depending on the degree of saturation achieved by the hydrogenation process, but peroxide is almost always used due to the good heat stability properties of the peroxide crosslinks. It can be compounded for both low and high temperature use.

Composition:

Formed by hydrogenating the nitrile copolymer of butadiene and acrylonitrile. Medium density.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength				•
Elongation			•	
Cold resistance			•	
Compression set				•
Tear resistance			•	
Abrasion resistance			•	
Flame resistance	•			
Gas permeability			•	

Chemical Resistance:*	Poor	Fair	Good	Excellent
Petroleum oils				•
Automotive refrigerants				•
Automatic transmission fluid				•
Sour crude oil		•		
Oxygenated fuels			•	
Ozone			•	
Weather			•	

Operating Temperature:**

-25° to +300°F

NATURAL RUBBER

(NR, Hevea)

Natural rubber, or NR, was the first commercially viable elastomer ever developed, and is still the only non-synthetic rubber in widespread use. In fact, natural rubber currently accounts for almost 40% of the world's elastomer consumption, as it is frequently blended with other rubbers to derive an ideal combination of properties, especially in automotive tire production. Derived from a liquid of the Hevea tree, NR latex is a low cost material that, when processed into dry rubber, exhibits excellent physical properties due to its high structural regularity. It is ideal for applications that require good resistance to abrasion, gouging and cut growth. Also, because it experiences little heat buildup during flexing, it is also commonly specified when shock and dynamic load requirements are deemed critical. Natural rubber is tough, long lasting and can be compounded for service at temperatures as low as -65°F. It is also easily bonded to metal and fabrics.

Composition:

Coagulated, dried rubber derived from the latex of the Hevea Brasiliensis tree. Low to medium density.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength				•
Elongation				•
Cold resistance			•	
Compression set			•	
Tear resistance				•
Abrasion resistance				•
Flame resistance	•			
Gas permeability		•		

Chemical Resistance:*	Poor	Fair	Good	Excellent
Water				•
Air			•	
Oxidation			•	
Alcohol			•	
Dilute acids and bases			•	
Steam	•			
Radiation		•		
Oil	•			
Gasoline	•			
Hydrocarbon solvents	•			
Sunlight		•		
Ozone	•			

Operating Temperature:**

-60° to +225°F

NITRILE RUBBER

(NBR, Buna N, Paracril®, Nipol®)

On a cost basis, nitrile rubber is the least expensive of the oil resistant elastomers. As a result, nitrile is the one of the most widely used rubber materials, due to its combination of low cost, resistance to many chemicals, and good physical properties. The acrylonitrile content of this highly polar elastomer provides excellent oil and gas permeation resistance, which increases as the level of ACN increases. However, an increase in the acrylonitrile content compromises low temperature flexibility, and increases compound hardness. Typical ACN content ranges from 18% to 50%. Nitrile should not be exposed to direct sunlight or moderate to high levels of atmospheric ozone, as rapid deterioration will result. However, NBR will accept many anti-degradants, most notably PVC, which offer some degree of improvement of these deficiencies. Nitriles are usually sulfur cured, but peroxide curing is also possible, resulting in improved compression set.

Composition:

Medium density copolymer of butadiene and acrylonitrile.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength			•	
Elongation			•	
Cold resistance			•	
Compression set			•	
Tear resistance			•	
Abrasion resistance			•	
Flame resistance	•			
Gas permeability			•	

Chemical Resistance:*	Poor	Fair	Good	Excellent
Water				•
Petroleum oil				•
Silicone lubricants				•
Dilute acids			•	
Dilute alkalis			•	
Hydraulic fluids			•	
Transmission fluid			•	
Steam		•		
Ozone	•			
Weather	•			
Ketones	•			
Strong acids	•			
Brake fluid	•			

Operating Temperature:**

-30° to +250°F

PERFLOUROELASTOMER

(FFKM, Kalrez®, Chemraz®)

FFKM combines the outstanding chemical resistance of PFTE with the elastomeric properties of fluorocarbon rubber; it is virtually impervious to 1500+ different chemicals. There are several different grades of FFKM, but all contain fully fluorinated polymer chains and hence offer the ultimate performance of elastomers when considering heat and chemical resistance. FFKM is the compound of choice in aggressive process environments, such as chemical and hydrocarbon plants, where no other elastomer can withstand the highly corrosive fluids likely to be encountered. Other uses can be found in the semiconductor, aerospace,and pharmaceutical industries, in part due to FFKM's superior resistance to outgassing.

Composition:

High density copolymer of tetrafluoroethylene and a perfluorinated ether.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength			•	
Elongation			•	
Cold resistance		•		
Compression set			•	
Tear resistance		•		
Abrasion resistance	•			
Flame resistance				•
Gas permeability		•		

Chemical Resistance:*	Poor	Fair	Good	Excellent
Resistant to most chemicals				•
Ozone				•
Fluorinated refrigerants	•			

Operating Temperature:**

-10° to +500°F

POLYACRYLATE RUBBER

(ACM, polyacrylic rubber, Hycar®)

Polyacrylate rubber, or ACM, is a specialty rubber whose primary strength is its ability to withstand high heat while retaining oil resistance. It is often the material of choice for applications that involve sulfur bearing lubricants, which are finding increased usage in automotive applications, especially transmission seals. From a performance standpoint, ACM occupies an intermediate position between nitrile and fluorocarbon. In addition, polyacrylates exhibit good damping characteristics, are not highly corrosive to steel, and can be compounded to provide excellent flex life and some degree of flame resistance. However, this acrylic based elastomer does have some limitations. Poor low temperature flexibility limits its usefulness and compression set is not as good as most other compounds. It is also inferior to many elastomers in tensile strength and water resistance.

Composition:

Medium density acrylic ester copolymer.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength		•		
Elongation		•		
Cold resistance	•			
Compression set		•		
Tear resistance		•		
Abrasion resistance			•	
Flame resistance	•			
Gas permeability				•

Chemical Resistance:*	Poor	Fair	Good	Excellent
Ozone				•
Weather				•
Sulfur containing oils			•	
Aliphatic solvents			•	
Dilute acids		•		
Dilute alkalis		•		
Water	•			
Steam	•			

Operating Temperature:**

-0° to +350°F

POLYURETHANE

(AU, EU, PU, Millathane®)

Polyurethane rubber is notable for its combination of hardness with elasticity, and outstanding abrasion resistance and tear strength. Elastomeric urethane rubber, not to be confused with thermoplastic polyurethane, may be formulated from either an ester (AU) or ether (EU) base; it is often referred to as "millable gum" urethane. The ester based polymer is superior in resistance to abrasion and heat but tends to be hygroscopic, while the ether based polymer has better flexibility at low temperatures. Polyurethane is a rather expensive material whose use is usually limited to applications that require a combination of its outstanding physical properties. Common end use applications are industrial rolls, O-Rings, caster wheels, gaskets, shoe soles and conveyor belts. Peroxide is the most commonly employed cure system, but sulfur curing is also possible in the extremely complex vulcanization chemistry involved in polyurethanes.

Composition:

Low to medium density polyurethane diisocyanate.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength				•
Elongation			•	
Cold resistance			•	
Compression set		•		
Tear resistance				•
Abrasion resistance				•
Flame resistance	•			
Gas permeability			•	

Chemical Resistance:*	Poor	Fair	Good	Excellent
Ozone				•
Weather				•
Oxidation				•
Silicone oils				•
Sunlight			•	
Air			•	
Alcohols	•			
Mineral oil			•	
Ethers	•			
LP gas			•	
Ketones	•			
Steam	•			
Aldehydes	•			
Concentrated acids	•			
Concentrated bases	•			

Operating Temperature:**

-40° to +180°F

PTFE

(Teflon®, Polyflon®)

PTFE is not a rubber compound, but a white thermoplastic resin which can be formed into various shapes by either machining or molding. It is a premium grade material, which is often specified in harsh chemical environments where no rubber material is suitable, as it is impervious to virtually all fluids and gases. PTFE exhibits very low moisture absorption, and can withstand extreme high and low temperatures. It also provides the lowest coefficient of friction of any seal material. One major drawback to using PTFE is a tendency to deformation under a continuous load, a phenomenon commonly known as "creep" or cold flow. Loading PTFE with fillers such as bronze, graphite, glass, or molybdenum disulfide can counteract this behavior substantially. PTFE also has relatively poor elasticity compared to other sealing materials. In addition to solid PTFE, RT Dygert also offers "CHEM-RINGS", which are Teflon® encapsulated O-Rings, with a silicone or Viton™ core, and normally covered with a FEP outer jacket.

Composition:

Fluorocarbon resin generically known as polytetrafluoroethylene

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength				•
Elongation	•			
Cold resistance				•
Compression set	•			
Tear resistance				•
Abrasion resistance				•
Flame resistance				•
Gas permeability				•

Chemical Resistance:*	Poor	Fair	Good	Excellent
Impervious to most chemicals				•

Operating Temperature:**

-300° to +500°F

SILICONE RUBBER

(VMQ, Silastic HCR®, Elastosil®)

Silicone is an inorganic rubber with an ability to retain its physical properties at higher temperatures than most other rubber materials. It is also flexible at very low temperatures; however its relatively poor tensile, tear strength and abrasion resistance limits use to static applications. These weaknesses can be improved somewhat by reinforcement with fine, high surface area fillers which are compatible chemically with the silicone polymer itself. Silicone does possess extraordinary resistance to oxidation and ozone degradation due to the absence of unsaturated double bonds in the polymer backbone. Since it is fully saturated, only peroxides can be used for hot vulcanization processes. Resistance of silicone vulcanizates to gas permeation is generally considered to be poor, as much as 100 times greater than nitrile or butyl, but it is frequently specified in food and beverage applications, as it imparts little taste or odor.

Composition:

Medium density inorganic rubber consisting primarily of polymethylsiloxane and variations.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength	•			
Elongation			•	
Cold resistance				•
Compression set			•	
Tear resistance	•			
Abrasion resistance	•			
Flame resistance		•		
Gas permeability	•			

Chemical Resistance:*	Poor	Fair	Good	Excellent
Ozone				•
Weather				•
Dilute alkalis				•
Vegetable oils			•	
Dilute acids		•		
Water			•	
Steam		•		
Petroleum oils	•			
Ketones	•			

Operating Temperature:**

-65° to +400°F

STYRENE-BUTADIENE RUBBER

(SBR, GRS, Buna-S)

Styrene-Butadiene rubber is much like natural rubber in many of its properties, and is one of the lowest cost and highest volume elastomers available. Although its physical properties are somewhat less than natural rubber, SBR is tougher, and slightly more resistant to heat and flex cracking. Much of its usage is in tire treads, especially blended with other polymers. It can readily be substituted for natural rubber in many other applications, thereby achieving significant cost savings. SBR is sometimes referred to as "GRS" or Government Rubber-Styrene, as its development began as a wartime emergency, necessitated by an interrupted supply of natural rubber. SBR is actually a generic term covering a wide variety of synthetic rubbers differing not only in the styrene-butadiene ratio, but also in the type of polymerization by which they are made.

Composition:

Low density copolymer of styrene and butadiene.

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength			•	
Elongation			•	
Cold resistance			•	
Compression set			•	
Tear resistance		•		
Abrasion resistance			•	
Flame resistance	•			
Gas permeability		•		

Chemical Resistance:*	Poor	Fair	Good	Excellent
Oxidation			•	
Alcohols			•	
Water			•	
Glycol			•	
Acetone			•	
Steam		•	•	
Weather		•		
Air			•	
Ozone	•			
Diester oils	•			
Mineral oils	•			
Silicone oils			•	

Operating Temperature:**

-50° to +225°F

VITON™ ETP

(Viton™ Extreme)

Viton™ ETP, or Viton™ Extreme, is resistant to the same fluids as other high fluorine FKMs such as aliphatic and aromatic hydrocarbons, hydraulic fluids, motor oils, fuels, etc. However it is also resistant to all types of alcohols, steam, strong bases, and polar fluids such as potassium hydroxide, ketones, MTBE and complex solvent mixtures. In fact, Viton™ ETP has the broadest fluid resistance of any FKM polymer on the market, making it ideal for severe service environments. Although costly, it can frequently be substituted for far more expensive perfluoroelastomers, at a fraction of the cost.

Composition:

High density terpolymer of ethylene, tetrafluoroethylene, and perfluoromethyl vinyl ether

Physical Properties:*	Poor	Fair	Good	Excellent
Tensile strength			•	
Elongation			•	
Cold resistance		•		
Compression set			•	
Tear resistance			•	
Abrasion resistance			•	
Flame resistance			•	
Gas permeability				•

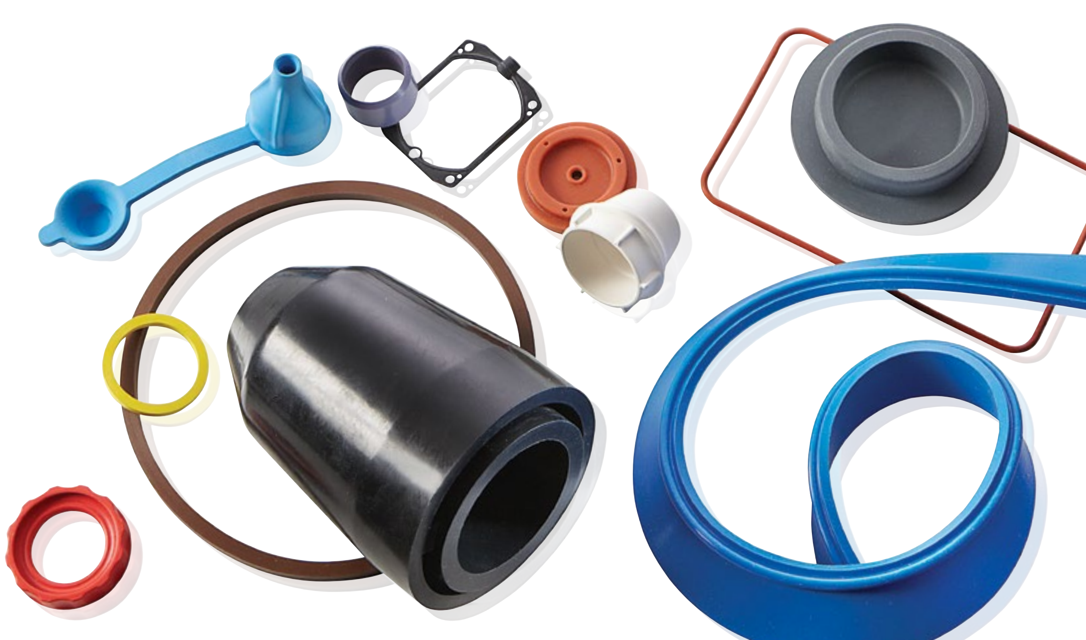
Chemical Resistance:*	Poor	Fair	Good	Excellent
Concentrated bases				•
Amines				•
Polar solvents				•
Nitric acids				•
Toluene				•
KOH				•
Acetic acid (30%)				•
Acetone			•	
Butyl acetate		•		
Tetrahydrofuran			•	
Ethylene diamine				•
Water				•

Operating Temperature:**

-10° to +400°F

* Excellent, good, fair and poor are intended to serve as general guidelines only. Actual testing in the application environment is always recommended.

** Operating temperature ranges are approximate and apply to medium hardness (~70 Shore A) compounds. Harder or softer compounds will have different temperature ranges.



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