

Elastomers for Energy, Oil & Gas Sealing

No. 5267B1/USA

**Parker engineered materials are specifically formulated for Energy, Oil & Gas sealing demands**

**Material design for harsh service demands**

Parker Hannifin's EPS Division, the leading developer of engineered polymer system solutions, offers a large selection of elastomeric and thermoplastic materials that are specifically formulated to meet the demands of the Energy, Oil, and Gas market. These materials are available in a wide range of both thermoplastic and thermoset materials. These materials, coupled with a variety of engineered shapes, have proven to meet the demands of the energy, oil, and gas market.

**Parofluor™ materials**

The newest materials developed for oilfield and chemical processing environments are Parker's Parofluor™ perfluoroelastomers. These compounds exhibit chemical resistance and thermal stability similar to PTFE, yet maintain the essential properties of resilience and memory, making them ideal for use as high-performance elastomer seals. Parofluor™ materials perform in the most aggressive chemical media, including H<sub>2</sub>S, CO<sub>2</sub>, and hydrocarbons.

**Explosive decompression**

A common challenge in oilfield sealing applications is explosive decompression or "ED." This phenomenon occurs when system pressure drops rapidly and the gases that have permeated into the elastomer suddenly expand. This rapid gas expansion causes the material to blister or split. Parker's compounds V1238A95, N4007A90 and V8588A90 exhibit superior ED resistance, and are ideal for use in applications where gas pressure fluctuates dramatically. With any material you have to be aware of the blow down rate to avoid ED.

**Widely varied media**

To provide exceptional sealing performance in energy oil and gas applications, a material must be resistant to a broad range of media. Parker's Parofluor compound V8588-90 and fluorocarbon compound V1238-95 along with UltraCOMP™ and Polon™ have been evaluated using NACE standard TMO 187-98 criteria. Parker materials retain their physical properties and sealability under these tough test conditions.

**Complete solution**

Parker's thermoplastic Polon or UltraCOMP provides a complete sealing system against heat, pressure, and chemical attack. Combinations of Parker's elastomers and thermoplastic materials have proven to be the best sealing system solution when conditions are extreme.



**Key features of Parker's specialty EOG materials**

Material	Feature
E0962A90	Geothermal EPDM, steam to 500°F.
N4007-90	Low compression set HNBR with superior resistance to abrasion, extrusion, sour gas, and ED.
N1210-90	Low compression set, extrusion resistant NBR.
V1238-95	Superior extrusion and ED resistance Fluorocarbon. Good H <sub>2</sub> S resistance.
V8588-90	Perfluorinated Elastomer has high temperature resistance, broad chemical compatibility and explosive decompression resistance.
Nitroxile™	High wearing high extrusion resistance materials with good chemical resistance and low compression set. N4263A90 and N4274A85.
Polon™	Superior PTFE, can be formulated for high wear and extrusion resistance. These can be formulated to meet specific applications.
UltraCOMP™	Engineered thermoplastic compounds. Formulated for high temperature, pressure and chemical environments, they have excellent fatigue resistance and ED resistant. Often used as bearing and backup devices.
UHMWPE	High wearing plastic for use in abrasive media, excellent in H <sub>2</sub> O based media.
Resilon™	Highest performing TPU's on the market today, having low compression set, excellent rebound, and superior resistance to hydrolysis when compared to other TPU's.
MolyGard™	Thermoplastic material, super hard. With a hardness of 120 Rockwell it has excellent extrusion resistance and load bearing abilities.
Molythane™	General purpose TPU used in petroleum based fluids, developed for high extrusion and wear resistance.
Polymyte™	A 60 shore D plastic-alloy material for high pressures and temperatures to 275°F in petroleum based fluids, and 180°F in H <sub>2</sub> O based fluids.

**Contact us**

Our experienced Application Engineers are your link to technical support for all of your sealing needs. They can help you optimize an existing seal design or explore innovative design alternatives. Call (801) 972-3000 for technical assistance.

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<b>NITRILES (Buna-N, NBR)</b>	Temp. Min	Max
<b>N4400A75</b> 75 Shore A durometer peroxide-cured nitrile. Excellent compression set resistance. Applications: Petroleum lubricants, seawater and diesel fuel.	-35°F	+275°F
<b>N1210A90</b> 90 Shore A durometer peroxide-cured nitrile. Improved compression set resistance, explosive decompression resistant. Applications: High pressure diesel fuel, methanol, ethylene glycol and water, CO <sub>2</sub> .	-30°F	+275°F
<b>N4180A80</b> 80 Shore A durometer, general purpose nitrile good compression set. Applications: Petroleum lubricants, seawater.	-30°F	+275°F
<b>N9643A90</b> 90 Shore A durometer packer element - meets API 11D1	-20°F	+275°F
<b>N9589A80</b> 90 Shore A durometer packer element - meets API 11D1	-20°F	+275°F
<b>HYDROGENATED NITRILES (HSN, HNBR)</b>		
<b>N1231A80</b> Explosive decompression resistance.	-30°F	+300°F
<b>N4025A80</b> 80 Shore A durometer abrasion resistant HNBR developed for low temperature resistance, excellent compression set resistance. Applications: High abrasion, high temperature resistance coupled with low temperature resistance.	-40°F	+300°F
<b>N4007A90</b> 90 Shore A durometer HNBR. High tensile. Excellent abrasion resistance. Applications: High wearing and pressure applications.	-20°F	+300°F
<b>N4288A85</b> 85 Shore A durometer; Excellent abrasion resistance. Good compression set. Good in Flex Fuels MTBE.	-25°F	+300°F
<b>ETHYLENE PROPYLENE (EPDM, EPR)</b>		
<b>E0962A90</b> 90 Shore A durometer; developed for steam service. Geothermal, high temperature, high pressure steam (intermittent to 550°F), resistant to CO <sub>2</sub> , H <sub>2</sub> S, methanol, glycols and explosive decompression.	-60°F	+500°F
<b>NITROXILE™</b>		
<b>N4263A90</b> 90 Shore A Durometer Nitroxile. Excellent abrasion resistance. Applications: Petroleum lubricants, seawater and diesel fuel.	-20°F	+275°F
<b>N4257A80</b> 80 Shore A durometer Nitroxile. Internally lubricated. Lower friction and excellent abrasion resistance. Applications: Petroleum lubricants, seawater, and diesel fuel.	-20°F	+275°F
<b>N4274A85</b> 85 Shore A durometer Nitroxile. Extreme low friction, internal lubricant for lower friction and excellent abrasion resistance. Applications: Petroleum lubricants, seawater, and diesel fuel.	-20°F	+275°F
<b>FLUOROCARBON (FKM)</b>		
<b>V4205A75</b> 75 Shore A durometer, general-purpose fluorocarbon. Excellent compression set resistance. Applications: High temperature, high pressure petroleum oils & fuels.	-15°F	+400°F
<b>V1238A95</b> 95 Shore A durometer fluorocarbon. Developed for maximum extrusion resistance, good compression set, explosive decompression resistant. Applications: High temperature, high pressure and H <sub>2</sub> S resistance.	-15°F	+400°F
<b>V4208A90</b> 90 Shore A durometer general purpose fluorocarbon. Excellent compression set resistance. Applications: High temperature, high pressure petroleum oils & fuels.	-15°F	+400°F
<b>V4266A95</b> 95 Shore A durometer general purpose fluorocarbon. Applications: Wear and extrusion resistance.	-15°F	+400°F
<b>PERFLUORINATED ELASTOMERS (FFKM)</b>		
<b>V8545A75 (FFKM)</b> 75 Shore A durometer high temp resistant perfluorinated elastomer. Good compression set resistance, extreme chemical resistance and low leachables. Extreme temperatures, chemical mixtures, high concentration H <sub>2</sub> S, amines, steam, polar fluids and solvents.	-15°F	+550°F
<b>V8588A90 (FFKM)</b> 90 Shore A durometer high temperature resistant perfluorinated elastomer. Extrusion and explosive decompression resistant. High temp/high pressure H <sub>2</sub> S, CO <sub>2</sub> , amines, polar fluids and solvents.	-15°F	+550°F
<b>HIGHLY FLUORINATED ELASTOMERS</b>		
<b>V3819-75 (Hifluor)</b> 75 Shore A durometer highly fluorinated material. Lower temperature range, cost-effective alternative to perfluorinated materials. Improved compression set and abrasion resistance. Resistant to aggressive chemicals, ketones, amines, acids and bases, polar fluids.	-15°F	+400°F

<b>V8534-90 (Hifluor)</b> 90 Shore A durometer highly fluorinated material. Extrusion resistant version of V3819-75. High pressure with aggressive chemicals.	-15°F	+400°F
<b>AFLAS TFE</b>		
<b>V4461A90</b> 90 Shore A Durometer material. Improved compression set resistance. Applications: Amines, H <sub>2</sub> S, steam, high temperature.	-15°F	+450°F
<b>V4276A85</b> 85 Shore A Durometer material. Improved compression set resistance. Applications: Amines, H <sub>2</sub> S, steam, high temperature.	-15°F	+450°F
<b>CHLOROPRENE (Neoprene, CR)</b>		
<b>C4107A75</b> 75 Shore A Durometer, excellent oxidation resistance. Applications: Limited in liquefied petroleum gasses (LPG), ammonia (amines) and many freons. Moderate oil resistance.	-45°F	+300°F
<b>ELASTO-PLASTIC MATERIALS</b>		
<b>Resilon™ HT P4300A90</b> High performance polyurethane designed for better physical properties. Improved compression set and rebound properties, gives increased sealing capabilities.	-65°F	+275°F
<b>Resilon WR P4301A90</b> High performance polyurethane similar to P4300 with resistance to water and water-glycol. Provides resistance to water attack while retaining hydraulic fluid compatibility.	-65°F	+275°F
<b>Resilon LF 4306A90</b> High performance polyurethane similar to P4300 with lower friction, reduced heat build-up and reduced wear.	-65°F	+275°F
<b>Polyurethane P4700A90</b> Superior polyurethane designed for enhanced physical properties. Improved compression set and rebound properties, gives increased sealing capabilities.	-50°F	+225°F
<b>Molythane™ P4615A90</b> Improved blend of polyurethane compounded for high extrusion resistance. Excellent wear and abrasion resistance.	-65°F	+200°F
<b>PLASTIC ALLOY MATERIALS</b>		
<b>PolyMyte™ Z4651</b> High tear strength, abrasion and extrusion resistance. Excellent resistance to petroleum fluids, many phosphate ester fluids, some chlorinated hydraulic fluids, up to 180°F in water, oxygen, common solvents, dilute bases and mineral acids. Good resistance to hostile environments.	-65°F	+275°F
<b>MolyGard™ W4650</b> Proprietary compound of filled nylon material for load bearing and anti-extrusion	-65°F	+250°F
<b>Nylatron™ W4655</b> Nylatron is used for abrasion resistant anti-extrusion devices, bearings or engineered parts. Resistant to most petroleum based fluids. May be used with phosphate ester hydraulic fluids, ketones, alkalis and weak acids.	-65°F	+250°F
<b>Polon™ PTFE</b>		
<b>0100</b> Virgin Polon™ Best for static applications. Good in Vacuum, low gas permeability. Excellent in cryogenics. (ref. Polon 100)	-450°F	+425°F
<b>0204</b> Glass and Moly filled Polon. Increases wear resistance in high speed reciprocating service and on harden shafts in well lubricated rotary applications. (ref. Polon 257)	-360°F	+550°F
<b>0201</b> Glass filled Polon is used for high wear resistance, and has excellent performance in seat and stem packings. (ref. Polon 134)	-360°F	+550°F
<b>0502</b> Carbon filled Polon for dynamic applications. Increased wear resistance and has low abrasion. (ref. Polon 08)	-360°F	+550°F
<b>0901</b> UHMWPE High wearing plastic used in abrasive media. Excellent in H <sub>2</sub> O based media. (ref. Polon 114)	-360°F	+180°F
<b>UltraCOMP™ ENGINEERED THERMOPLASTICS</b>		
<b>UltraCOMP HTP W4685</b> Used for replacing brass, bronze or other metallic members in sealing and back-up systems. Non filled UltraCOMP	-65°F	+500°F
<b>UltraCOMP CGT W4738</b> Carbon, Graphite, and PTFE filled. Used for replacing brass, bronze or other metallic devices in sealing back-up systems.	-65°F	+500°F