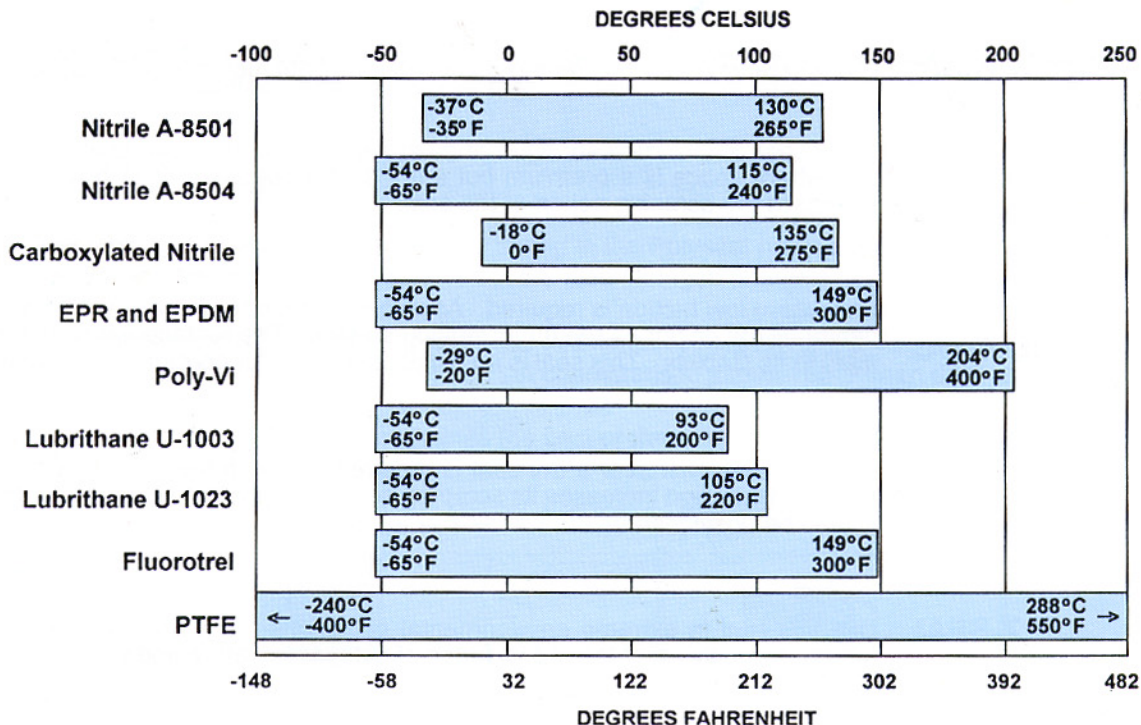
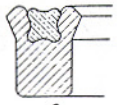
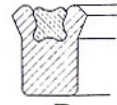
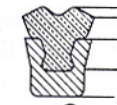
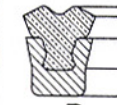
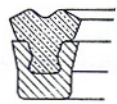
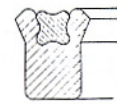
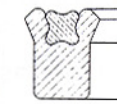
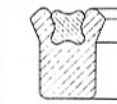


Temperature Range By Polymer



TEMPERATURE RANGE is determined by the type of base polymer from which compounds are made. The above chart depicts the maximum temperature range for each polymer, assuming continuous exposure. Short term or intermittent exposure extends high temperature potential, while adverse application conditions reduce temperature capabilities. Engineering assistance is available from Macrotech Polyseal on applications that exceed the temperature guidelines. The above chart does not take into consideration the fluid media to be sealed. Most chemical reactions increase with temperature rise; therefore, all seals should be tested at the temperature and in the fluid in which they are to be used.

FLUID COMPATIBILITY TABLE

KEY:			
<p>POLYSEAL LUBRITHANE BASE NITRILE ENERGIZER</p>  <p>A</p>	<p>POLYSEAL FLUOROTREL BASE POLY-VI ENERGIZER</p>  <p>B</p>	<p>DEEP Z SEAL NITRILE LIP FLUOROTREL BASE</p>  <p>C</p>	<p>DEEP Z SEAL ETHYLENE PROPYLENE LIP FLUOROTREL BASE</p>  <p>D</p>
<p>DEEP Z SEAL POLY-VI LIP FLUOROTREL BASE</p>  <p>E</p>	<p>POLYSEAL ETHYLENE PROPYLENE BASE AND ENERGIZER</p>  <p>F</p>	<p>POLYSEAL POLY-VI BASE AND ENERGIZER</p>  <p>G</p>	<p>POLYSEAL NITRILE BASE AND ENERGIZER</p>  <p>H</p>

HYDRAULIC FLUIDS COMPATIBILITY, GENERAL

FLUIDS	RECOMMENDED SEAL
Petroleum based hydraulic fluids	A, C, E
Phosphate Ester fire-resistant hydraulic fluids	D**, E, B*
Water and Glycol fire-resistant hydraulic fluids	C, D**, E, A
Water and oil emulsion fire-resistant hydraulic fluids	C, E, A*
Automotive brake fluid	D, F
Automotive transmission fluid	A*, E, H, G

* Below 150°F only

** No contamination of Petroleum based fluid can be present.

Note: When a mixture of various hydraulic fluids exists in the system, "E" should be selected as the seal. The Poly-Vi lip of this seal is generally more compatible with mixtures of fluids.

Most of Macrotech Polyseal's products consist of more than one material. Therefore, fluid compatibility is based on a judgment, thus putting greater emphasis on the material of the sealing lip.

The seal recommendations listed on the charts above are based on compatibility at relatively low temperatures. Since most chemical reactions increase with temperature rise, seals should be tested in the fluid medium and at the temperature under which they are expected to be used. As a rule of thumb, if the temperature is expected to exceed 180°F, and if the fluid compatibility with the lip material is not known, a test should be made at the higher temperature.

Where two or more material combinations are expected to work equally well, the order of recommendation is based on lowest cost. However, it is important to be aware that some material combinations are listed as Standard Non-Stock, and that the additional time to obtain the product may influence the selection of the seal.

AVAILABLE MATERIAL COMBINATIONS

STANDARD STOCK MATERIALS

STANDARD NONSTOCK MATERIALS

NITRILE RUBBER 70A

**LUBRITHANE 95A

PATENT NO. 3,851,888

*POLY-VI 75A

ETHYLENE PROPYLENE 70A

*FLUOROTREL 55D

*POLY-VI 90A

ETHYLENE PROPYLENE 90A

NITRILE RUBBER 90A

NITRILE RUBBER 70A

LUBRITHANE 95A

PATENT NO. 3,848,880

*POLY-VI 90-95A

ETHYLENE PROPYLENE 70A

*FLUOROTREL 55D

*FLUOROTREL 65D

PTFE

**POLYPHENYLENE SULFIDE

NITRILE RUBBER 70A

LUBRITHANE 95A

PATENT NO. 4,635,945

*POLY-VI 90-95A

ETHYLENE PROPYLENE 70A

*FLUOROTREL 55D

*FLUOROTREL 65D

PTFE

**POLYPHENYLENE SULFIDE

*TRADEMARK MACROTECH POLYSEAL, INC.

POLY-VI (FLUOROELASTOMER)
LUBRITHANE (URETHANE)
FLUOROTREL (POLYESTER ELASTOMER)

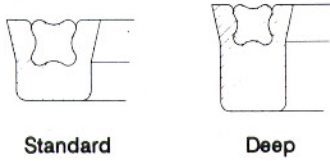
** TEMPERATURE AND CHEMICAL RESISTANCE OF THIS MATERIAL EXCEED THAT OF THE FLUOROTREL MATERIALS. CHECK WITH MACROTECH/POLYSEAL ENGINEERING ON SPECIFIC APPLICATIONS.

NOTE: METRIC SIZES ARE AVAILABLE FOR MOST MACROTECH POLYSEAL PRODUCTS.

Macrotech Polyseal has a full range of problem solvers.

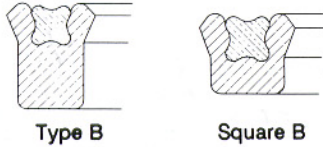
Net and Compression Molded Sealing Devices

Hydraulic Rod Seals



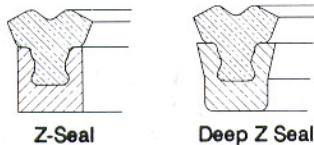
Standard/Deep Polyseals

The **Standard Polyseal** is the original Polyseal design--most widely used to replace most existing packings and/or O-rings. The **Deep Polyseal** offers increased stability in high pressure applications.



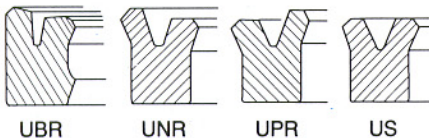
Type B/Square B Polyseals

Along with extra stability, the **Type B Polyseal** features a back-beveled sealing lip for maximum film-breaking ability. The **Square B Polyseal** is sized to replace most existing packings and/or O-rings.



Z-Seal/Deep Z Seal

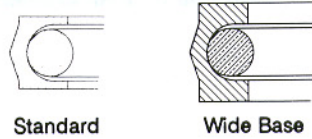
For extreme environmental conditions, the **Z-Seal** offers the widest range of temperature and chemical resistance. The **Deep Z Seal** is a redundant-lip seal for rod applications in all types of environments. The temperature range of **Deep Z Seal** is -65°F to +400°F.



U-Cups

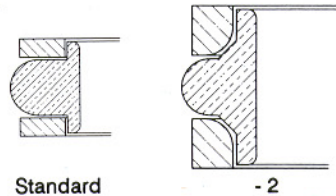
Our line of **U-Cups** include **UBR**, **UNR** (rod), **UNP** (piston) and **US** (symmetrical) styles for an economical alternative in rod or piston sealing applications.

Hydraulic Piston Seals



Crown Seals

Our positive, bi-directional **Crown Seals** can be used for either rod or pistons, directly replacing T-Seals, O-Rings and Quad Seals. For wider grooves, we also offer a **Wide Base** style.



T-Seals

Bi-directional for either piston or rod applications, our **T-Seals** offer excellent chemical resistance and a temperature range of -65°F to +450°F. Varying gland widths are accommodated by our -1 and -2 styles (-2 pictured).

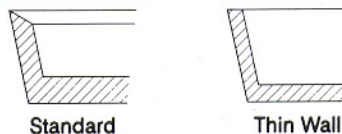
Pneumatic Seals



K-Seals

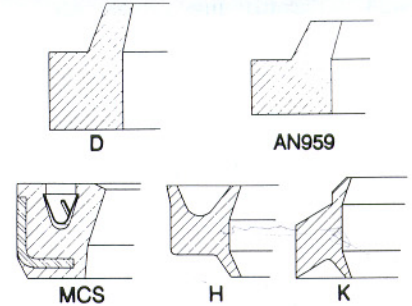
For light action, non-lubricated pneumatic systems, our Lubrithane **K-Seal** offers low friction and long life. Replacing conventional U-Cup seals, the **K-Seal** is available in type **KR** for rod applications and **KP** for piston applications.

Piston Cups



Our **Piston Cup** line includes a **Standard** style for general pneumatic and hydraulic applications, and a **Thin Wall** style that provides lower friction at light pressures.

Excluders



Our line of excluders (wipers) offers excellent scraping abilities and contamination prevention for a variety of applications. The light duty, snap-in, **AN959 Wiper** will retrofit into glands prescribed in MS-33675 for corresponding dash numbers of MS-28776. Our **D Wiper** is ideal for large diameter applications and more contaminated environments. Our **Metal Clad (MC) Wiper**, consisting of a Lubrithane element housed in an "L" shaped metal retainer, handles tough scraping problems such as mud, ice and weld splatter--also available as **MCS**, which includes a steel spring (pictured). Our **H** and **K Wipers** feature a sealing lip as well as a wiper/scrapper lip for secondary sealing of the system.

For information on these and other Macrotech Polyseal products, feel free to contact us.

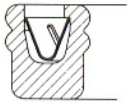


MACROTECH POLYSEAL, INC.

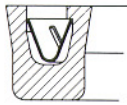
Macrotech Polyseal has a full range of problem solvers.

Engineered and Machined Sealing Devices

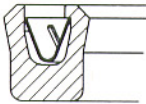
SpectraSeals



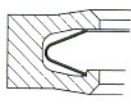
Standard Seal



Scraper Seal



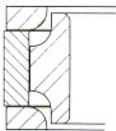
Type B



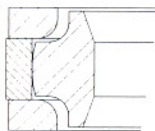
Internal Face Seal

SpectraSeals are high performance PTFE seals used in hostile and severe sealing environments. Custom made to precisely meet your requirements, **SpectraSeals**, along with our other PTFE seals, operate within an exceptionally wide temperature range of -400°F to $+550^{\circ}\text{F}$. Shown above are some of the basic styles available. Combinations of these and other styles, along with almost any PTFE compound material, are available.

Capped T-Seals



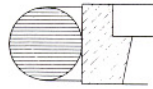
Standard



MK/EK

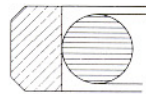
Capped T-Seals are double-acting, high pressure, high performance piston seals comprised of a filled PTFE cap (many compounds available) and an elastomeric energizer. These two components are protected from extrusion and foreign material by two plastic anti-extrusion rings. The excellent stability of **Capped T-Seals** accommodates larger extrusion gaps and oversize bores. Also available are **MK Capped T-Seals**, used in Metric-dimensioned J.I.S. cylinders, and **EK Capped T-Seals**, used in glands similar to **MK** applications except in Imperial (inch) sizes.

Buffer Seals



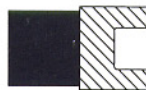
Buffer Seals are secondary PTFE seals used to protect the primary seal from damage caused by pressure spikes and excessive heat buildup. Designed to be used with an elastomeric energizer (either an O-ring or square ring), **Buffer Seals** can be used in hydraulic and pneumatic systems in reciprocating, oscillating or helical motion. They are used in both rod and piston applications, most commonly as secondary rod seals.

PTFE Piston Seals



PTFE Piston Seals are square or rectangular cross-sectioned rings used in single and double acting applications, usually with an O-ring (as pictured above). In addition to reciprocating situations, these seals can be used in slow rotary and oscillating applications. Available with "broken" or chamfered corners, **PTFE Piston Seals** are a low cost alternative for many uses. **PTFE Rod Seals** are also available.

Grooved Piston Ring



The Polyseal Grooved Piston Ring is a high performance bi-directional seal intended for use where extremely low leakage is required. Good seal stability is achieved by using a square cut elastomeric energizer. Macrotech Polyseal uses design criteria taken from many years experience in the machined plastics industry.

Wear Guides



WGT



WAT

Close Tolerance Wear Guides are Reinforced Nylon bearings that support, guide and reduce friction between the fixed and reciprocating parts of hydraulic and pneumatic cylinders. They may be utilized in both rod and piston applications. **Close Tolerance Wear Guides** also prevent metal-to-metal contact which can score cylinder bores and rods, resulting in seal damage. With the use of **Close Tolerance Wear Guides**, the overstressed condition on the seal due to excessive side loading is eliminated, providing extended seal life. Shown above are the two standard styles available, the **WGT** (Butt Cut) and **WAT** (Angle Cut). Filled PTFE is also available for this product.

For information on these and other Macrotech Polyseal products, feel free to contact us.



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