

Fluorocarbon Polymers for Sealing



Fact Sheet

How to Choose?

Recent developments in fluorocarbon polymer technology have opened up a new world of possibilities for the seal designer. Today's fluorocarbons offer increased resistance to chemicals and temperature, lower volume swell, and many other benefits that make them ideal for use in extreme sealing environments.

So why is it still so difficult to choose the right fluorocarbon for your sealing application?

Relax. This fact sheet is designed to provide you with all the information you need to make the right material choice.

Here's a summary of available fluorocarbon polymers and some of their important characteristics. Please note that the following designations (i.e., A, B, GF, GLT) are based on widely recognized nomenclature established by Dupont Dow Elastomers many years ago. Other fluorocarbon polymer suppliers use different designations for the various types listed here.

A or E type FKM – The oldest and most common elastomers in the FKM product line. They generally have 66% fluorine content and are supplied to the most common aerospace specifications including MIL-R-83248. These grades are considered general purpose FKMs. A or E types exhibit low compression set, but are not resistant to flex fuels containing high levels of alcohol or MBTE.

B type FKM – Developed to increase the fluorine content and offer better fluid resistance to acids and flex fuels than the A or E types. They generally have 67% fluorine content and are commonly used in applications where resistance to flex fuels containing alcohol or MTBE is required.

GF or F type FKM – An extension of the B type technology with further increases in fluorine content to provide better fuel and solvent resistance. They generally have 70% fluorine content and are used in flex fuel and agricultural applications where a variety of very aggressive chemicals are routinely used.

GLT type FKM – Developed to improve the low temperature flexibility as compared with traditional A or E type FKMs. The low temperature flexibility normally reaches -40° F. They generally have 65% fluorine content and are not suitable for flex fuels or aggressive solvents.

GFLT type FKM – Developed to balance fluid resistance with improved low temperature flexibility. They generally have 68% fluorine content and are rated to -35° F. These materials are suitable for flex fuel applications.

69% Fluorine FKM – Developed to improve the balance of mechanical properties with improved fluid resistance. Generally containing 69% fluorine content, these materials exhibit excellent resistance to flex fuels, agricultural chemicals as well as dramatically improved compression set resistance as compared with other high fluorine content materials.

AFLAS™ – The tradename for a copolymer of tetrafluoroethylene and propylene (TFE/P) available from Asahi Glass. Developed to provide resistance to strong bases, amines, and polar solvents such as acetone and methyl ethyl ketone (MEK). They generally have 60% fluorine and are typically considered for use in the chemical process and energy industries.

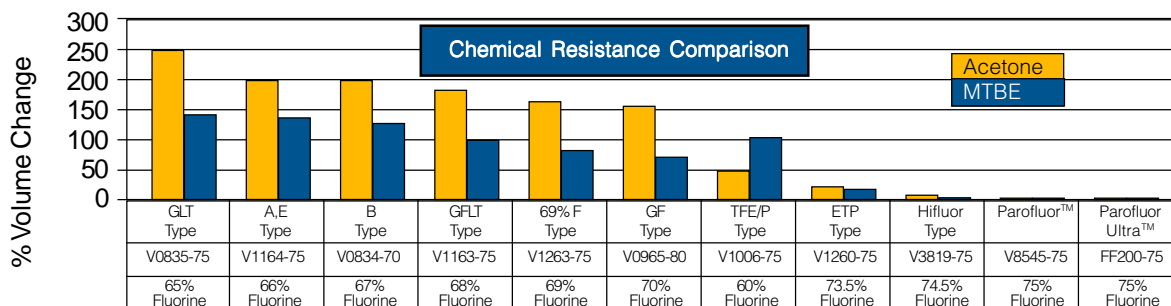
Viton® Extreme – Chemically, a terpolymer of Ethylene, Tetrafluoroethylene and Perfluoro Methyl Vinyl Ether. The first letters of these three components form the acronym "ETP" that is sometimes used to describe this product. These materials generally have 73.5% fluorine, and offer improved resistance to aggressive solvents.

Hifluor™ – Chemically, very similar to Parofluor™ perfluorinated elastomers. This material generally contains 74.5% fluorine, which further improves aggressive chemical resistance. Hifluor is an attractive alternative in the chemical processing industry where very good chemical resistance is required without the 500° F+ heat resistance of a perfluorinated elastomer.

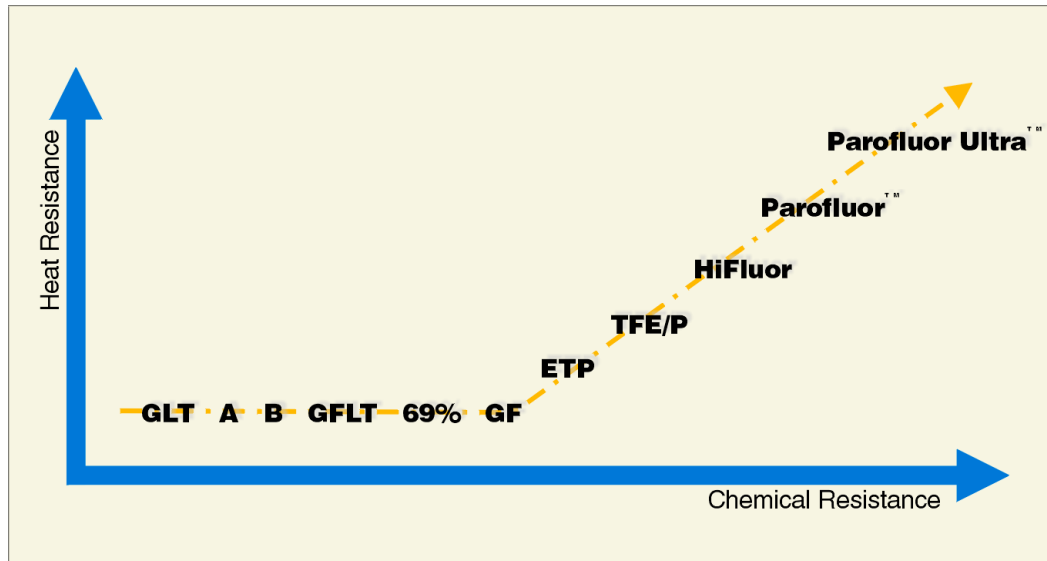
Parofluor™ – Parker's trademark for its perfluorinated (FFKM) elastomers. Using Parker test methods, this material measures at 75% fluorine. This ensures the best overall resistance to aggressive solvents and chemicals.

Parofluor Ultra™ – A new line of Parofluor™ (FFKM) products designed to improve the performance of traditional Parofluor™, with higher temperature stability, broader chemical resistance, and higher purity.

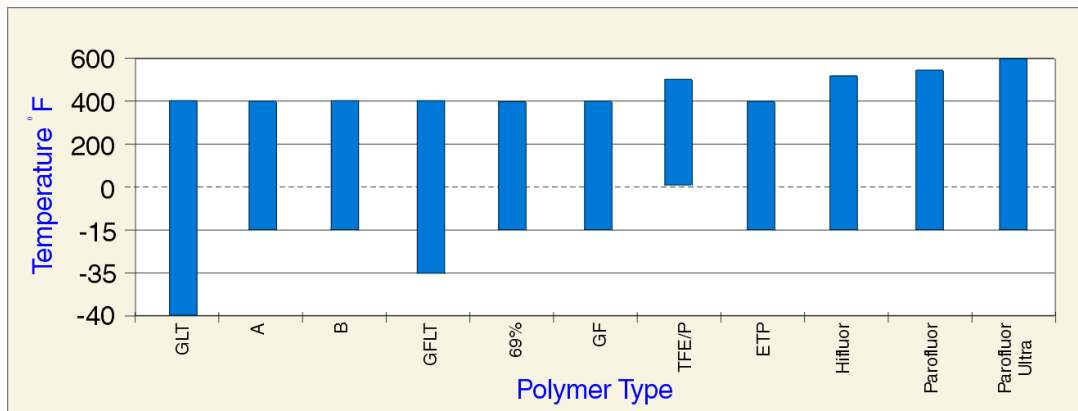
AFLAS™ is a trade name of Asahi Glass.
Viton® is a trade name of Dupont Dow Elastomers.
Parofluor™ and Parofluor Ultra™ is a trade name of Parker Hannifin Corp.



Application Profile of FKM/FFKM Elastomers

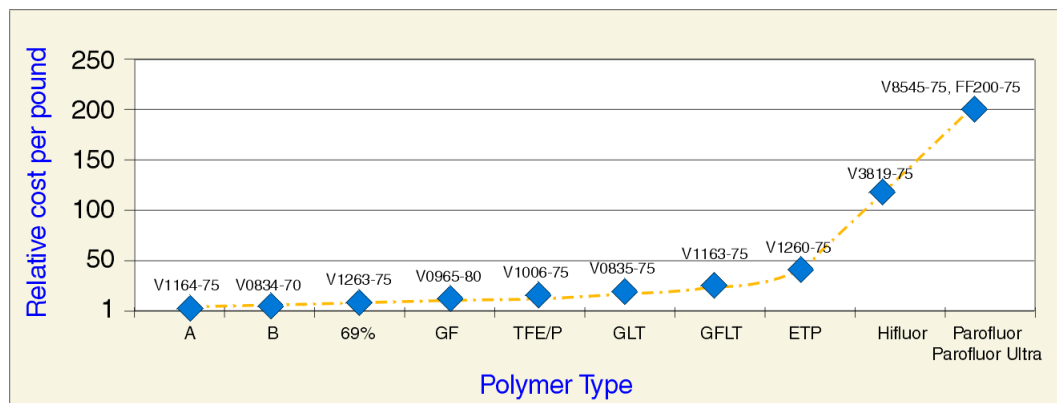


Thermal Stability of FKM/FFKM Elastomers



Note: For exact temperature ranges, please refer to TOTAL inPHorm software or Parker's O-Ring Handbook. Or call a Parker application engineer.

Relative Material Cost of FKM/FFKM Elastomers



Note: The above relative cost information is intended for informational purposes only. This information is influenced by specific manufacturing process steps, and may vary by product.

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