

PINPSEALS FFKM

PINPSEALS FFKM perfluoroelastomer parts are available in a number of different compounds that are formulated to optimize properties to give the best possible performance in various applications. Modification of the finished properties is achieved by use of fillers and other additives. Table 1. summarizes the basic physical properties of the most commonly used FFKM products for the chemical and hydrocarbon processing industries. Descriptions of the key attributes for each product and their general areas of application follow.

Table 1. Typical Physical Properties¹

PINPSEALS FFKM PRODUCTS	Standard			Specialty				
	6375	7075	4079	6380	7090	0090	0040	1050LF
Maximum Application Temp ² , °C °F	275 527	327 620	316 600	225 437	325 617	250 482	220 428	288 550
Durometer Hardness, Shore A ³ , Points ±5	75	75	75	80	90	95	70	82
100% Modulus ⁴ , MPa psi	7.24 1,050	7.58 1,100	7.24 1,050	6.89 1,000	15.51 2,250	(50% Modulus) 14.20 2,060	6.61 960	12.40 1,800
Tensile Strength at Break ⁴ , MPa psi	15.16 2,200	17.91 2,600	16.88 2,450	15.86 2,300	22.75 3,300	19.51 2,830	13.72 1,990	18.60 2,700
Elongation at Break ⁴ , %	160	160	150	160	75	80	180	125
Compression Set ⁵ , % 70 hr at 204 °C (400 °F)	25	12	25	38	12	40	38	35
Tr 10 ⁶ , °C °F	-3 26.6	-4 24.8	-2 28.4	-5 23.0	-5 23.0	-7 19.4	-17 1.4	-4 24.8

1 Not to be used for specifications

2 Pinpseals proprietary method; performance will vary with seal design and application specifics

3 ASTM D2240

4 ASTM D412, 500 mm/min (20 in/min)

5 ASTM D395 – Method B, pellets

6 ASTM 132

Standard Products

PINPSEALS FFKM 6375 is a carbon black-filled product for general use in O-rings, seals, diaphragms and other parts specifically for the chemical process industry. This product has excellent broad chemical resistance, good mechanical properties, and outstanding hot-air aging properties. FFKM 6375 is well suited for use in mixed process streams because of its excellent resistance to acids, bases, and amines. It is also recommended for use in hot water, steam, pure ethylene oxide and propylene oxide.

PINPSEALS FFKM 7075 has enhanced physical properties including very low compression set and improved seal force retention. It is a carbon black-filled product utilizing proprietary cure chemistry. Its mechanical properties are designed for improved sealing performance in both high temperature environments and temperature cycling situations. FFKM 7075 O-rings have a glossy finish. This product was specifically developed for the chemical and hydrocarbon industries to provide improved chemical and thermal resistance better than the industry standard set by FFKM 4079.

PINPSEALS FFKM 4079 is a low compression set product for general-purpose use in O-rings, diaphragms, seals, and other parts used in the process and aircraft industries. It is a carbon black-filled product with excellent chemical resistance, good mechanical properties, and outstanding hot air aging properties. It exhibits low swell in organic and inorganic acids and has good response to temperature cycling effects. This product is not recommended for use in hot water/steam applications or in contact with certain hot aliphatic amines, ethylene oxide, or propylene oxide.

Specialty Products

Note: Before ordering FFKM parts in specialty products, please consult with PINPSEALS or its authorized distributor technical staff to determine properties needed for the application. Specialty products are generally not held in inventory.

PINPSEALS FFKM 6380 is a non-black product specifically developed for chemical processes involving hot, aggressive amines. It has also been successfully used in applications involving highly oxidizing chemicals. In addition, it has excellent overall chemical resistance. This cream colored product is easily identifiable when selecting an O-ring material for harsh chemical plant services.

PINPSEALS FFKM 7090 is a product for uses requiring higher hardness/higher modulus than more typical applications. FFKM 7090 perfluoroelastomer parts are well suited for both static and dynamic applications as well as specific sealing applications requiring extrusion resistance at high temperatures. These specialty black parts have excellent thermal and mechanical properties, including excellent compression set and seal force retention, resistance to temperature cycling effects, and rapid gas decompression (RGD). Short excursions to higher temperatures may also be possible.

PINPSEALS FFKM 0090 is a black product with broad chemical resistance combined with high modulus and high hardness. FFKM 0090 parts have outstanding resistance to extrusion and rapid gas decompression (RGD). This product has been independently tested and certified by the Materials Engineering Research Laboratory (MERL – UK) to meet NORSOK-M-710 Rev 2 requirements.

PINPSEALS FFKM 0040 is a black product specifically designed for low temperature environments where significant chemical resistance is required. FFKM 0040 parts maintain elasticity and seal force at temperatures unattainable by other perfluoroelastomers.

PINPSEALS FFKM 1050LF is a carbon black-filled product for O-rings, seals, and other parts used in chemical process industries. It has good hot water/steam, and excellent amine resistance. FFKM 1050LF is not recommended for use in organic acids, or inorganic acids at high temperatures.

Product Safety

Highly toxic products can be generated when FFKM parts are exposed to fire or temperatures in excess of 400 °C so respiratory equipment should be used if ventilation is inadequate. FFKM parts are incompatible and should not be exposed to alkali metals or interhalogen compounds.