

# DuPont™ Kalrez®

## Physical Properties and Product Comparisons

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DuPont™ Kalrez® 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 Kalrez® 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 Properties<sup>1</sup>**

DuPont™ Kalrez® Products	Standard			Specialty				
	6375	7075	4079	6380	7090	0090	0040	1050LF
Maximum Application Temp <sup>2</sup> , °C	275	327	316	225	325	250	220	288
°F	527	620	600	437	617	482	428	550
Durometer Hardness, Shore A <sup>3</sup> , points ±5	75	75	75	80	90	95	70	82
100% Modulus <sup>4</sup> , MPa	7.24	7.58	7.24	6.89	15.51	14.20 (50% Modulus)	6.61	12.40
psi	1,050	1,100	1,050	1,000	2,250	2,060	960	1,800
Tensile Strength at Break <sup>4</sup> , MPa	15.16	17.91	16.88	15.86	22.75	19.51	13.72	18.60
psi	2,200	2,600	2,450	2,300	3,300	2,830	1,990	2,700
Elongation at Break <sup>4</sup> , %	160	160	150	160	75	80	180	125
Compression Set <sup>5</sup> , % 70 hr at 204 °C (400 °F)	25	12	25	38	12	40	38	35
Tr10 <sup>6</sup> , °C	-3	-4	-2	-5	-5	-7	-17	-4
°F	26.6	24.8	28.4	23.0	23.0	19.4	1.4	24.8

<sup>1</sup> Not to be used for specifications

<sup>2</sup> DuPont proprietary method; performance will vary with seal design and application specifics

<sup>3</sup> ASTM D2240

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

<sup>5</sup> ASTM D395 – Method B, pellets

<sup>6</sup> ASTM 1329



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## Standard Products

**DuPont™ Kalrez® Spectrum™ 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. Kalrez® Spectrum™ 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.

**DuPont™ Kalrez® Spectrum™ 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. Kalrez® Spectrum™ 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 Kalrez® 4079.

**DuPont™ Kalrez® 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 Kalrez® parts in specialty products, please consult with DuPont or its authorized distributor technical staff to determine properties needed for the application. Specialty products are generally not held in inventory.

**DuPont™ Kalrez® Spectrum™ 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.

**DuPont™ Kalrez® Spectrum™ 7090** is a product for uses requiring higher hardness/higher modulus than more typical applications. Kalrez® Spectrum™ 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.

**DuPont™ Kalrez® 0090** is a black product with broad chemical resistance combined with high modulus and high hardness. Kalrez® 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.

**DuPont™ Kalrez® Spectrum™ 0040** is a black product specifically designed for low temperature environments where significant chemical resistance is required. Kalrez® Spectrum™ 0040 parts maintain elasticity and seal force at temperatures unattainable by other perfluoroelastomers.

**DuPont™ Kalrez® 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. Kalrez® 1050LF is not recommended for use in organic acids, or inorganic acids at high temperatures.

**Other Properties**

Other properties, such as coefficients of friction, thermal conductivity, electrical and permeability may be of interest for specific applications. For more detailed information, please refer to the DuPont™ Kalrez® Application Guide available for download at <http://www.dupontelastomers.com/kag>.

**Product Safety**

Highly toxic products can be generated when Kalrez® parts are exposed to fire or temperatures in excess of 400 °C so respiratory equipment should be used if ventilation is inadequate. Kalrez® parts are incompatible and should not be exposed to alkali metals or interhalogen compounds. Please consult “Guide For Safety In Handling Kalrez® Perfluoroelastomer Parts” (KZE-A10301) for additional information.