

DuPont™ Kalrez®

Chemical Process Industry (CPI) Product Selector Guide

Technical Information — February 2017

Recognized as the leading supplier of perfluoroelastomer parts for over 40 years, DuPont offers a variety of high performing products that are formulated to give the best possible seal performance in numerous aggressive environments. Excellent balance of finished properties is achieved through careful use of proprietary polymers, cure systems, fillers and additives, resulting in superior seals for a broad range of applications.

This selector guide summarizes key physical properties and attributes of the most commonly used Kalrez® products for the chemical process industry, providing general chemical compatibility guidance.

For more detailed information about each product, please consult the Kalrez® Application Guide online at [Elastomers Chemical Resistance Guide and Kalrez® Application Guide](#) or contact a Kalrez® application engineer to assess performance fit in your specific application.



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Product Selector

The following guide is a quick/easy tool for the selection of Kalrez® products for the chemical process industry.

DuPont™ Kalrez® Products								
Chemical Environment	6375	4079	7075	7090	7275	6380	0040	0090
	General Purpose - Broadest Chemical Resistance	High Temperature - High Mechanical Strength	Highest Temperature Resistance - Lowest Compression Set	High Temperature, - High Hardness	Specialty - Oxidizing & Reactive Chemical Environments	Specialty - Strong Amines	Specialty - Low Temperature	Rapid Gas Decompression (RGD) Resistance
Acids	X	XX	XX	XX	X	X	XX	X
Inorganic Bases	XX	X	X	X	X	XX	X	XX
Hydrocarbons	XX	XX	XX	XX	X	X	XX	XX
Solvents	XX	XX	XX	XX	X	X	X	XX
Hot Water/Steam	XX	---	---	---	X	X	---	XX
Amines (Organic Bases)	X	---	---	---	X	XX	---	XX
Vinyl or Acrylic Monomers	X	---	---	X	XX	X	---	X
Silanes and Chlorosilanes	X	X	X	X	XX	---	---	---
Synthetic Oils	X	XX	XX	XX	X	---	X	X
Strong Oxidizers (e.g., Nitric Acid, O ₃ , ClO ₂)	---	---	---	---	XX	X	---	---
Aldehydes	X	---	---	---	XX	X	---	---
Streams of Unknown Composition	XX	---	---	---	X	XX	X	X
Ethylene or Propylene Oxide (Pure)	X	---	---	---	XX	XX	---	XX
Dry Heat	X	XX	XX	XX	X	---	---	X
High Pressure / Extrusion Resistance	---	---	---	XX	---	---	---	XX
RGD (Rapid Gas Decompression Resistance)	---	---	---	X	---	---	---	XX
Maximum Service Temperature ¹ , °C (°F)	275 (527)	316 (600)	327 (620)	325 (617)	300 (572)	225 (437)	220 (428)	250 (482)
Lowest Service Temperature ¹ , °C (°F)	-20 (-4)	-19 (-2.2)	-18 (-0.4)	-26 (-14.8)	-20 (-4)	-22 (-7.6)	-42 (-43.6)	-21 (-5.8)
Color	Black	Black	Black	Black	Light Brown	Cream	Black	Black
Durometer, Shore A ²	75	75	75	90	75	80	70	95
Elongation at Break ³ , %	160	150	160	75	160	160	180	80
Compression Set ⁴ , % (70 hours at 204°C/400°F)	25	25	12	12	N/A	38	38	19
Compression Set ⁵ , % (70 hours at 204°C/400°F)	30	30	15	12	22	40	41	33
Tensile Strength at Break ⁶ , MPa (psi)	15.16 (2198)	16.88 (2448)	17.91 (2598)	22.75 (3300)	14.50 (2103)	15.86 (2300)	8.96 (1300)	19.49 (2827)

XX Best

X Suitable

--- Not suggested

¹ DuPont proprietary method; performance will vary with seal design and application specifics

² ASTM D2240, (Pellet test specimens)

³ ASTM D412, (AS568 K214 O-ring test specimens)

⁴ ASTM D395B, (Pellet test specimens)

⁵ ASTM D395B, (AS568 K214 O-ring test specimen)

⁶ ASTM D412, 500mm/min (Dumbbell test specimens)

N/A = Test Data Not Available



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Product Description

General Purpose

Kalrez® 6375

DuPont™ Kalrez® 6375 perfluoroelastomer parts, designed specifically for the chemical process industry, are designed to give outstanding performance in the widest possible range of chemicals and temperatures. This product is an excellent choice for use in acids, bases, amines, steam, ethylene oxide, and many other aggressive chemicals. The curing system also allows for a maximum service temperature of 275°C (527°F). This high temperature stability translates to increased chemical resistance over all temperature ranges, especially if high temperature process excursions occur. This combination of chemical and thermal resistance provides advantages for chemical processors. Today, chemical processors may use several perfluoroelastomer parts, including Kalrez® 4079, and 1050LF to optimize chemical and thermal performance. Kalrez® Spectrum™ 6375 may be used in many applications to displace these products. However, if optimum chemical resistance is required, then applications must be individually reviewed for the optimum product selection.

Kalrez® 4079

DuPont™ Kalrez® 4079 perfluoroelastomer parts are a low compression set product for general purpose use in O-rings, diaphragms, seals and other parts used in the chemical process industry. 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 acids, inorganic acids and aldehydes, and has good response to temperature cycling effects. A maximum service temperature of 316°C (600°F) is recommended, with short excursions to higher temperatures possible. Kalrez® 4079 is not recommended for use in hot water/steam applications or in contact with certain hot aliphatic amines, ethylene oxide, or propylene oxide.

Kalrez® 7075

DuPont™ Kalrez® 7075 perfluoroelastomer parts are a carbon black filled product that has enhanced physical performance properties including very low compression set and improved seal force retention. This product is designed for improved sealing performance in both high temperature environments and temperature cycling situations. Kalrez® 7075 provides even greater sealing performance in dynamic applications where low friction is required and it was specifically developed to be used in the chemical and hydrocarbon processing industries, with an improved thermal resistance that extends maximum service temperature to 327°C (620°F). Kalrez® Spectrum™ 7075 offers the enhanced elastomeric properties outlined above while providing chemical resistance better than the industry standard, set by Kalrez® 4079.

Specialty Products

Kalrez® Spectrum™ 7090

DuPont™ Kalrez® Spectrum™ 7090 perfluoroelastomer parts are specifically targeted for use in applications requiring high hardness/higher modulus properties. These specialty black parts have excellent mechanical properties including compression set resistance, seal force retention, response to temperature cycling effects and rapid gas decompression resistance. Kalrez® Spectrum™ 7090 perfluoroelastomer parts are well suited for both static and dynamic sealing applications; especially applications that require extrusion resistance at higher temperatures. They also offer outstanding thermal stability and chemical resistance. A maximum service temperature of 325°C (617°F) is suggested. Short excursions to higher temperatures may also be possible.

Kalrez® 7275

DuPont™ Kalrez® 7275 parts are a light brown product based on a proprietary crosslinking system targeted specifically for the chemical processing industry. It exhibits minimal swelling and improved retention of physical properties when exposed to aggressive chemicals, e.g., concentrated nitric acid, organosilanes, chlorosiloxanes, pure ethylene oxide, butyraldehyde, amines and vinyl and acrylic monomers. It also has excellent compression set resistance and good retention of physical properties after aging at high temperatures. A maximum service temperature of 300°C is suggested.



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Kalrez® 6380

DuPont™ Kalrez® 6380 perfluoroelastomer parts are a non-black product specifically developed for chemical processes involving hot, aggressive amines and excellent overall chemical resistance. This cream colored product is easily identifiable when selecting an O-ring material for harsh chemical plant services. This material has excellent mechanical properties and is a top choice for both static and dynamic sealing applications. A maximum service temperature of 225°C (437°F) is suggested, while short-term excursions to higher temperatures are permissible.

Kalrez® Spectrum™ 0040

DuPont™ Kalrez® Spectrum™ 0040 perfluoroelastomer parts are specifically designed for low temperature environments where significant chemical resistance is required. Low temperature sealing performance (-42°C) typically unattainable for perfluoroelastomers parts is achievable with Kalrez® Spectrum™ 0040. Kalrez® Spectrum™ 0040 is an excellent choice in applications such as couplings for the chemical transportation industry or for other applications where chemical resistance and elasticity are required in some of the coldest environments. The volume swell for Kalrez® Spectrum™ 0040 is approximately 10% when exposed to nitric acid at 110°C for 168 hours. Compression set resistance is similar to that of our broad chemically-resistant product, Kalrez® Spectrum™ 6375.

Kalrez® 0090

DuPont™ Kalrez® 0090 perfluoroelastomer parts deliver durable, reliable sealing solutions for applications requiring excellent rapid gas decompression (RGD) properties as well as high hardness and high modulus properties. Some application areas include downhole equipment such as drilling and completion tools as well as industrial equipment including pumps and valves. Kalrez® 0090 has been certified by two independent labs to meet rigorous requirements for resistance to RGD. In addition to demonstrated RGD resistance, DuPont™ Kalrez® 0090 seals have other chemical and temperature properties that provide superior performance.

- Chemical resistance: Kalrez® parts withstand attack by more than 1800 chemical substances. Kalrez® 0090 can be resistant to sour multi-phase fluids containing H₂S as shown by the external NORSOK M-710 Rev 2 Sour Fluid aging resistance certification provided by MERL (UK).
- Broad temperature capability: Kalrez® 0090 retains high levels of resilience up to temperatures as high as 250°C (482°F) and down to -21°C (-5.8°F). Under pressurized sealing conditions, Kalrez® 0900 has demonstrated low temperature performance down to -40°C (-40°F) in customer laboratory tests.

Visit us at kalrez.dupont.com or vespel.dupont.com

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