



Kalrez[®] perfluoroelastomer parts

From DuPont Performance Elastomers

Kalrez[®] Spectrum[™] 6375

Product Overview

For over 25 years, Kalrez[®] parts have been the sealing material of choice for long-term reliable sealing in the harshest chemical environments. Today, elastomeric seals are expected to perform in a variety of even more aggressive chemicals and at higher temperatures. To meet the needs of chemical processors, DuPont Performance Elastomers has developed a product that expands on the capabilities of existing Kalrez[®] parts with broader chemical resistance while maintaining the high temperature stability you've come to expect from Kalrez[®].

Kalrez[®] Spectrum[™] 6375

Kalrez[®] Spectrum[™] 6375, designed specifically for the chemical process industry, combines innovative polymer and cure technology 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. Mixed streams, once a problem for many chemical processors, can now be handled by compound 6375. The curing system also allows for a continuous upper service temperature of 275°C (527°F). This is approximately 100°F higher than other products claiming broad chemical resistance. 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 use several perfluoroelastomer parts, including compounds 4079, 1050LF, and 2035, 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 compound selection.

Typical Physical Properties¹

Hardness ² , Shore A	75
100% Modulus ³ , MPa (psi)	7.24 (1050)
Tensile at Break ³ , MPa (psi)	15.16 (2200)
Elongation at Break ³ , %	160
Compression Set ⁴ , % 70 hr at 204°C (400°F)	30
Maximum Service Temperature ⁵ , °C (°F)	275 (527)

¹ Not to be used for specifications

² ASTM D2240 (pellet test specimen)

³ ASTM D412, 500 mm/min (dumbbell test specimen)

⁴ ASTM D395B (AS568 K214 O-ring test specimen)

⁵ DuPont Performance Elastomers proprietary test method

Chemical Resistance to:	Kalrez[®] 6375	Kalrez[®] 4079	Kalrez[®] 2035	Kalrez[®] 1050LF
Aromatic/Aliphatic oils	++++	++++	++++	++++
Acids	++++	++++	++++	+++
Bases	++++	+++	+++	++++
Alcohols	++++	++++	++++	++++
Aldehydes	++++	+++	++++	++++
Amines	+++	+	++	++++
Ethers	++++	++++	++++	++++
Esters	++++	++++	++++	++++
Ketones	++++	++++	++++	++++
Steam/Hot water	++++	+	+++	+++
Strong Oxidizers	++	++	++	++
Ethylene Oxide	++++	X	++++	X
Hot Air	+++	++++	++	+++

++++ = Excellent +++ = Very Good ++ = Good + = Fair x = Not Recommended

Chemical Resistance

For many applications, low volume swell of elastomers is critical to proper operation of equipment. Excessive swell may cause permanent seal failure due to equipment hangup, extrusion, etc. The following data is the result of lab testing to determine the volume swell of Kalrez[®] Spectrum[™] 6375 when exposed to various fluids. Other physical property testing is needed to further define product performance; however, volume swell is an excellent predictor of performance. The following chemicals were chosen since they are representative of some of the most aggressive applications in the industry. These test results are an indication of the performance of compound 6375; however, all applications are unique, and it is strongly recommended that immersion testing be performed in the actual process fluids.

Chemical	Temperature °C (°F)	Kalrez[®] Spectrum[™] 6375 Rating	Nearest Competitive FFKM
Water	225 (437)	A	C
Glacial acetic acid	100 (212)	A	A
Nitric acid (70%)	85 (185)	B	C
Sulfuric acid (98%)	150 (302)	A	C
Maleic acid	90 (194)	A	B
Ammonium hydroxide	100 (212)	B	B
Ethylene oxide	50 (122)	A	A
Urea	175 (347)	A	B
Epichlorohydrin	100 (212)	A	A
Butyraldehyde	70 (158)	A	B
Toluene diisocyanate	100 (212)	A	B
HCFC 134a	25 (77)	A	A

Exposure time = 672 hr.

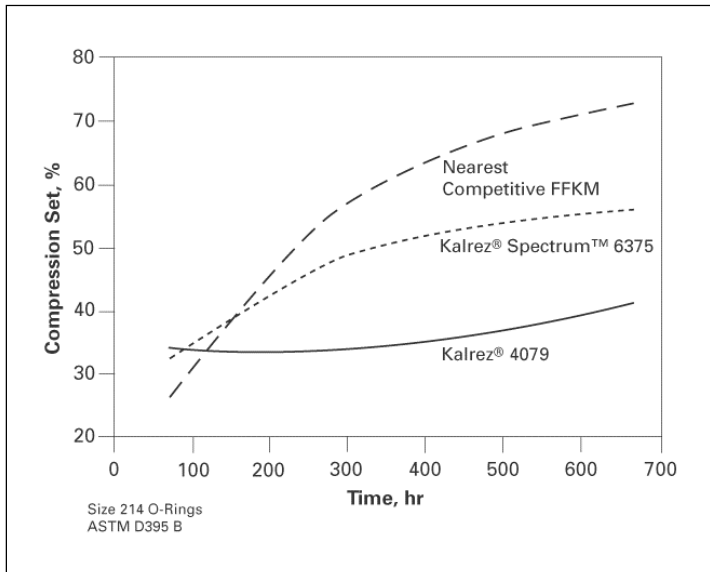
Rating system:

A: 0–10% volume swell
 B: 10–20% volume swell
 C: >20% volume swell

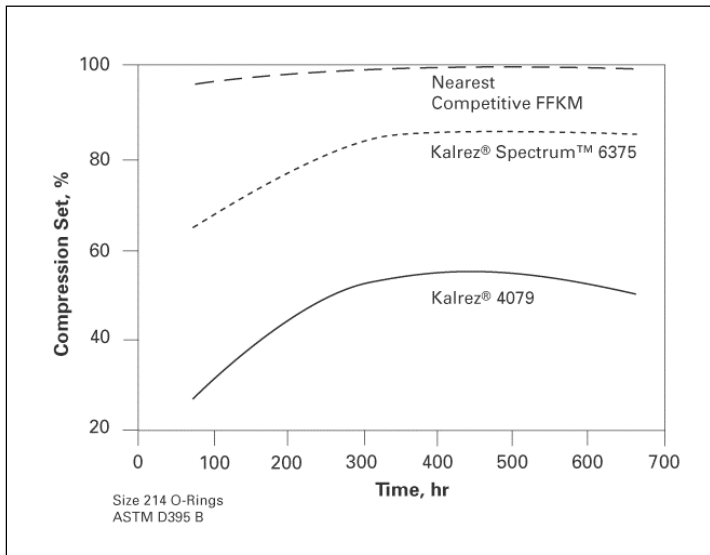
Thermal Resistance

Kalrez® Spectrum™ 6375 has excellent heat resistance to go along with the outstanding chemical resistance. Innovative curing technology allows this compound to have a continuous use service temperature of 275°C (527°F). This results in the best combination of chemical resistance and thermal resistance of any elastomer on the market today. One method of predicting heat resistance is compression set. This is defined as: the amount by which a standard test piece (typically an O-ring or pellet) fails to return to its original thickness after being subjected to a standard compressive load or deflection for a fixed period of time. The following charts shows some elastomer comparisons with regard to compression set resistance.

Compression Set vs. Time at 204°C (400°F)



Compression Set vs. Time at 260°C (500°F)



For further information please contact one of the addresses below, or visit us at our website at www.dupontelastomers.com/kalrez

Global Headquarters — Wilmington, DE USA

Tel. +1-800-853-5515
+1-302-792-4000
Fax +1-302-792-4450

European Headquarters — Geneva

Tel. +41-22-717-4000
Fax +41-22-717-4001

South & Central America Headquarters — Brazil

Tel. +55-11-4166-8978
Fax +55-11-4166-8989

Asia Pacific Headquarters — Singapore

Tel. +65-6275-9383
Fax +65-6275-9395

Japan Headquarters — Tokyo

Tel. +81-3-6402-6300
Fax +81-3-6402-6301

The information set forth herein is furnished free of charge and is based on technical data that DuPont Performance Elastomers believes to be reliable. It is intended for use by persons having technical skill, at their own discretion and risk. Handling precaution information is given with the understanding that those using it will satisfy themselves that their particular conditions of use present no health or safety hazards. Since conditions of product use and disposal are outside of our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information. As with any material, evaluation of any compound under end-use conditions prior to specification is essential. Nothing herein is to be taken as a license to operate or a recommendation to infringe on any patents. While the information presented here is accurate at the time of publication, specifications can change. Check www.dupontelastomers.com for the most up-to-date information.

CAUTION: Do not use in medical applications involving permanent implantation in the human body. For other medical applications, discuss with your DuPont Performance Elastomers customer service representative and read Medical Caution Statement H-69237.

DuPont™ is a trademark of DuPont and its affiliates.

Kalrez® and Kalrez® Spectrum™ are trademarks or registered trademarks of DuPont Performance Elastomers.

Copyright © 2005 DuPont Performance Elastomers L.L.C. All rights reserved.