



## Kalrez<sup>®</sup> perfluoroelastomer parts

From DuPont Performance Elastomers

### Compound 4079 (colour: black)

#### General Description

Kalrez<sup>®</sup> 4079 is a carbon black filled compound having excellent chemical resistance and mechanical properties. It has a maximum operating temperature of 315°C, although short excursions to higher temperatures are possible. It exhibits low swell in organic and inorganic acids and aldehydes and has good response to temperature cycling effects. Kalrez<sup>®</sup> 4079 has outstanding hot air ageing properties and exhibits very low and stable compression set at high temperatures. Its relatively low modulus can be a great help in assembly. This is a general purpose material suitable for around 95% of all applications in all industries. Some of its uses are O-rings, diaphragms, seals, gaskets and other custom parts.

Compound 4079 is not recommended for applications involving water/steam and aliphatic amines at higher temperature. It should never be used in applications involving ethylene oxide or propylene oxide.

The physical properties of compound 4079 are as follows:

#### Typical Physical Properties<sup>1</sup>

Hardness <sup>2</sup> , Shore A ±5	75
100% Modulus <sup>3</sup> , MPa (psi)	7,2 (1050)
Tensile Strength at Break <sup>3</sup> , MPa (psi)	16,9 (2450)
Elongation at Break <sup>3</sup> , %	150
Compression Set <sup>4</sup> , 70 hr at 204°C, %	25

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

<sup>2</sup> ASTM D2240

<sup>3</sup> ASTM D412, 500 mm/min (20 in/min)

<sup>4</sup> ASTM D395 B, pellets

#### Chemical Resistance

Material Compound	Kalrez <sup>®</sup> 4079
<i>Chemical Resistance to:</i>	
Aromatic/Aliphatic oils	+++*
Acids	+++*
Alkalis	+++*
Alcohols	+++*
Aldehydes	++
Amines	+
Ethers	+++*
Esters	+++*
Ketones	+++*
Steam/Hot water	0
Strong Oxidizers	0
Ethylene/Propylene Oxide	--

+++ = Excellent  
++ = Very Good

+ = Good  
0 = Marginal

- = Poor  
-- = Not Recommended

\* = Recommended compound for this chemical

The major exceptions to the use of compound 4079 are listed below:

#### Hot water and steam

- Use Kalrez® 2035 up to 210°C.
- Use Kalrez® 1050LF up to 280°C.
- Use Kalrez® 3018 for high pressure applications.

#### Propylene/Ethylene oxide

- Use Kalrez® 2035.

#### Hot aliphatic amines — above 80°C (the major aliphatic amines are ethylene diamine and hexamethylene diamine)

- Use Kalrez® 3018 up to 280°C.
- Use Kalrez® 1050LF up to 280°C.

#### Miscellaneous Properties

Many miscellaneous properties are of interest for specific applications. Some of these are unaffected by compound choice while others vary with hardness or extensibility. As an example, coefficient of friction typically increases as hardness decreases. In general, miscellaneous physical properties are similar to those of Viton® fluoroelastomer.

The following are some of the properties for Kalrez®:

---

#### Physical Properties

---

Specific gravity, g/cm<sup>3</sup> 1.90–2.00

---

#### Miscellaneous

---

Oxygen — Autogenous Ignition Temperature  
Compound 1050LF 313°C (595°F)  
Compound 1045 370°C (698°F)

---

#### Thermal Properties

---

Linear coefficient of thermal expansion (25–250°C)	Specific heat
$L = L_0 (1 + a\Delta T)$	at 50°C (122°F) = 0.945 J/g (0.226 cal/g)
$a = 2.3 \times 10^{-4}/^{\circ}\text{C}$	at 100°C (212°F) = 0.974 J/g (0.233 cal/g)
$= 1.3 \times 10^{-4}/^{\circ}\text{F}$	at 150°C (302°F) = 1.053 J/g (0.252 cal/g)

---

#### Permeation Rates of Gases

---

Gas	Nitrogen	Oxygen	Helium	Hydrogen	Argon	Krypton	Xenon
Temperature, °C	RT	RT	RT	93	93	93	93
Rate**	0,05	0,09	2,5	113	6,1	9,9	19,9

---

\*\*x10<sup>-9</sup> cm<sup>3</sup>-cm

s - cm<sup>2</sup>-cm Hg ΔP

---

For further information please contact one of the addresses below, or visit us at our website at

[www.dupontelastomers.com/kalrez](http://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](http://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 Viton® are registered trademarks of DuPont Performance Elastomers.

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