



DuPont™ Kalrez® Spectrum™ 0040
Sealing Solutions for Low
Temperature Environments



The miracles of science™

DuPont™ Kalrez® Seals For Frigid Temperatures



Fight leaks and chemical attack at temperatures down to -42°C with new DuPont™ Kalrez® Spectrum™ 0040 O-rings, gaskets and more.

Kalrez® Spectrum™ 0040 joins the Kalrez® Spectrum™ family of parts for the chemical and hydrocarbon processing industries.

Where Low-Temperature Performance Pays

Chemical and hydrocarbon processing equipment involving cold startup, hose couplings for chemical transport equipment, and manhole seals for rail cars, aircraft and other aerospace vehicles are among the many potential applications for DuPont™ Kalrez® Spectrum™ 0040 parts.



Broad Temperature Range

DuPont™ Kalrez® Spectrum™ 0040 parts help provide leak-resistant seals at temperatures ranging from -42°C to $+220^{\circ}\text{C}$. They are already delivering major benefits to early users in low-temperature environments.

Proven Success in Refining

At an oil refinery in midwestern Canada, DuPont™ Kalrez® Spectrum™ 0040 mechanical seals for various hydrocarbons operated continuously for six months before a scheduled shutdown. They replaced O-rings made of fluoropolymer-encapsulated silicone which had an MTBR (meantime between repairs) of about one week. Temperatures ranged from -48°C to $+15^{\circ}\text{C}$ and back to -48°C in a 24 hour period.

A Winner in Couplings

A major coupling supplier has tested DuPont™ Kalrez® Spectrum™ 0040 parts for sub-zero environments in the Arctic, Northern Europe and other global regions. In the coupling supplier's stringent tests, DuPont™ Kalrez® Spectrum™ 0040 parts provided reliable seals at temperatures down to -17°C .

What It Takes For A -42°C Rating

O-rings are placed in a test fixture mounted on the inside wall of a pressure-tight container. The container is then filled with nitrogen to reach an internal pressure of 0.4 MPa (60 psi). Temperature is then dropped in 0.5°C increments until leakage to the outside of the container is detected.

In the case of DuPont™ Kalrez® Spectrum™ 0040 sample parts, minimal leakage was first detected at -42°C .

Chemical Resistance

Unlike some low-temperature seals, DuPont™ Kalrez® Spectrum™ 0040 parts help withstand attack by most aggressive chemicals. They provide a more reliable alternative to silicone and other low-temperature elastomer parts offering chemical resistance.

See the table on page 3 for a summary of resistance to major classes of chemicals by DuPont™ Kalrez® Spectrum™ 0040 parts. For comprehensive information on resistance to specific chemicals, visit kalrez.com.



High Performance DuPont™ Kalrez® Spectrum™ Family Meets Increased Demands in Harsh Conditions

The Kalrez® Spectrum™ family offers a variety of products designed for your specific application requirements.

DuPont™ Kalrez® Spectrum™ 0040 parts help withstand many aggressive chemicals and demonstrate improved sealing performance in extreme low temperature environments, a major benefit in equipment used in high latitude, high altitude or other freezing cold environments.

In applications where there are mixed streams, unknowns in the process or process excursions, our flagship product, DuPont™ Kalrez® Spectrum™ 6375, offers the broadest chemical resistance.

Contact a Kalrez® Application Engineer to help you determine which Kalrez® Spectrum™ product is best suited for your environment.



DuPont Expertise Can Help

DuPont™ Kalrez® Spectrum™ 0040 confirms yet again the benefits from DuPont leadership in perfluoroelastomer technology. Our material and application expertise coupled with control of the entire development process from polymer to finished part are unique in the industry.

We help you with the technical assistance and support you need to achieve optimum results in the shortest possible time. Our worldwide technical expertise can help you in your product selection and seal design, application testing and development, failure analysis and on-site training.

DuPont™ Kalrez® Spectrum™ 0040 and 6375 Chemical Resistance

Chemical Resistance (672 hr immersion testing)	DuPont™ Kalrez® Spectrum™ 0040	DuPont™ Kalrez® Spectrum™ 6375
Inorganic Acid (Nitric Acid 70% at 85 °C)	2	2
Inorganic Acid (Sulfuric Acid 98% at 150 °C)	1	1
Organic Acid (Glacial Acetic Acid at 100 °C)	2	1
Bases (Ammonium Hydroxide at 100 °C)	1*	1
Amines (Ethylene Diamine at 90 °C) (Primary)	2	2
Steam/Hot Water (Steam at 200 °C) (168 hr)	1	1
Steam/Hot Water (Water at 200 °C) (168 hr)	1	1
Aldehydes (Butyraldehyde at 70 °C)	2	1

Test method: ASTM D471 (AS568 K214 O-ring test specimens).

* Predicted based on comparable resistance to other chemicals, including acids and amines.

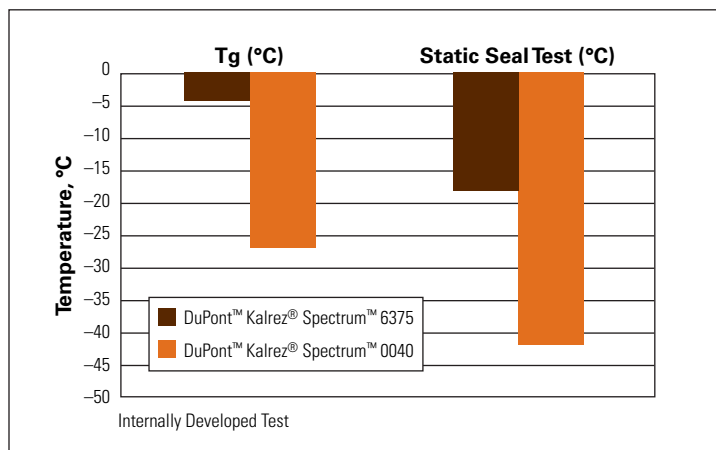
KEY Volume Swell: 1 = Excellent 0–10%; 2 = Satisfactory 10–20%;
3 = Doubtful 20–30%; 4 = Not Recommended >30%.



Available in Many Shapes

- Standard O-rings in AS-568, metric and JIS sizes
- Customized O-rings in various cross-sections and diameters
- Valve seats, diaphragms, gaskets, packer seals, T-seals and more

DuPont™ Kalrez® Spectrum™ 0040 and 6375 Low Temperature Performance



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

Contact DuPont at the following regional locations:

North America

800-222-8377

Latin America

+0800 17 17 15

Europe, Middle East, Africa

+41 22 717 51 11

Greater China

+86-400-8851-888

ASEAN

+65-6586-3688

Japan

+81-3-5521-8484

The information set forth herein is furnished free of charge and is based on technical data that DuPont believes to be reliable and falls within the normal range of properties. It is intended for use by persons having technical skill, at their own discretion and risk. This data should not be used to establish specification limits nor used alone as the basis of design. 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 our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information. As with any product, evaluation 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 patents.

Caution: Do not use in medical applications involving permanent implantation in the human body. For other medical applications, discuss with your DuPont customer service representative and read Medical Caution Statement H-50103-3.

Copyright © 2010 DuPont. The DuPont Oval logo, DuPont™, The miracles of science™, Kalrez®, Kalrez® Spectrum™, and Vespel® are registered trademarks of E.I. du Pont de Nemours or its affiliates. All rights reserved.

Reference Number KZE-A10839-00-A0610 (08/10) Printed in the U.S.A.



The miracles of science™