



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

A Product of DuPont Dow Elastomers

## Kalrez<sup>®</sup> Seals . . . A Lot Less Expensive Than the Cost of Downhole Seal Failure

### Six Years of Downhole Proof No Failures with Kalrez Seals

With over 2,000 wells, the records show it: no well has ever had to be reworked because a Kalrez V-ring failed. Even under torturous conditions of pressure, heat, and man-made chemicals, Kalrez perfluoroelastomer seals have held up and remain virtually unchanged.

#### *Six-Year Field Service Record*

##### Conditions

Depth, m (ft)	4,572 (15,000)
Temperature, °C (°F)	149°C (300°F)
Pressure, MPa (psi)	46 (6,700)
H <sub>2</sub> S, %	10
CO <sub>2</sub> , %	20

##### Production

Oil, BBL/Day	3,000
Water, BBL/Day	125
Gas/Oil Ratio	1.3

##### Physical Property Comparison (Kalrez 3065 Compound)

##### New V-Rings

Tensile at Break, MPa (psi)	20 (3,010)
Elongation, %	27
Hardness, Shore A	95

##### Six Years Downhole V-Rings

Tensile at Break, MPa (psi)	21 (3,120)
Elongation, %	30
Hardness, Shore A	85

When a seal failure in a 3048-m (10,000-ft) well can mean a \$100,000 rework, why trust anything less than the proven performance of Kalrez perfluoroelastomer seals?

### Proven Reliability Since 1976

The deeper the well, the more harsh the conditions, the more you need Kalrez reliability. Kalrez has been field-proven across the industry in these applications:

- Tubing-to-Packer Seals
- Subsurface Safety Valves
- Logging Boots
- Casing Tie-Back Seals
- Survey Tool Seals
- Slip-Joint Seals

Kalrez has been successfully used by these equipment and service companies:

- Arrow Oil Tools
- Baker Hughes
- Camco, Inc.
- Dresser/Guiberson
- Halliburton
- PES
- Texas Iron Works

Kalrez®—Downhole with many production companies, including:

- Amerada Hess
- Amoco
- Aramco
- Arco
- BP
- Cities Service
- CITCO
- Coastal Corp.
- Coastal Oil & Gas
- Conoco
- Dowell–Canada
- Exeter
- Exxon, USA
- Hunt Oil
- Marathon
- Mesa
- Mobil
- Patrick Petroleum Co.
- Pennzoil Co.
- Phillips Petroleum
- Shell
- Texaco
- Union Oil

## Kalrez Protects When Downhole Conditions Deteriorate

Downhole conditions can deteriorate rapidly. Blistering heat, corrosive fluids, and toxic gases can destroy the physical properties and sealing performance of other materials. Only Kalrez combines the resilience and sealing force of rubber with the chemical inertness and thermal stability associated with Teflon®. Kalrez seals resist attack by all well fluids and additives: hydrogen sulfide, carbon dioxide, brine, sulfuric and hydrochloric acids, amine-based corrosion inhibitors, and solvents including benzene, toluene, acetone, high-aromatic hydrocarbons, and methanol.

Even under grueling long-term service, with temperatures to 260°C (500°F), Kalrez parts resist swelling, blistering, and embrittlement. To date, over 50,000 Kalrez V-rings have withstood severe downhole stresses without reported failure. That's Kalrez reliability.

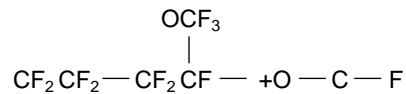
On your next completion, specify Kalrez—the seal that is good for the life of your well.

## Downhole Conditions Change, but Kalrez Seals Don't

Inside a well, the only constant thing is change. Because they have no active hydrogen, Kalrez parts successfully resist thermal and chemical fluctuations that cause lesser elastomers to fail.

DuPont Dow Elastomers Kalrez is perfluorinated—completely protected by inert fluorine atoms. Nothing reacts with it.

### *Kalrez Perfluoroelastomer*



Common fluoroelastomers have active hydrogen atoms. Under hostile conditions, hydrogen reacts with other elements, gradually degrading the seal.

Kalrez perfluoroelastomer seals stand up to severe downhole conditions. No chemical or thermal degradation of sealing parts means no loss of sealing reliability.

Because environmental conditions change over the life of a well, specify the seal that doesn't change—Kalrez.

## **The DuPont Dow Seal of Confidence**

DuPont Dow Elastomers manufactures Kalrez® parts to assure you of exacting quality control from start to finish.

The reputation of DuPont Dow for technical excellence is behind every Kalrez seal. That means consistent standards and consistent compounding, time after time, seal after seal.

When you buy Kalrez, you buy DuPont Dow Elastomers—that's your seal of confidence.

## **Kalrez Seals Not Only Protect Your Investment, They Protect Your Reputation**

When even a minor seal failure can disrupt a million dollar operation and mean catastrophic repair costs—can you afford not to have Kalrez on your side?

By preventing the need for workover to reseal, and making it easier to pull the tubing string when necessary, Kalrez seals save you time and money. They also increase the reliability of safety valves and other flow control devices.

By reducing unnecessary workovers, profit-draining labor costs, disrupted schedules, and missed deadlines, Kalrez parts work hard to protect your investment—and your reputation.

When you can't afford to jeopardize a completion, you can't afford not to specify Kalrez—to save the cost of downhole seal failure.

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For more information on Kalrez®  
or other elastomers:

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