

# DuPont™ Kalrez® 8002

For Semiconductor Processes

Technical Information—Rev 9, June 2011

## Product Description

DuPont™ Kalrez® 8002 perfluoroelastomer parts are a clear product for ash/strip and “select” etch and deposition processes. This unfilled product offers excellent plasma-cracking resistance and ultra-low particle generation in oxygen and fluorine-based plasmas versus mineral-filled products. Kalrez® 8002 exhibits excellent resistance to dry process chemistry, has good mechanical strength and is well suited for static, low stress/low sealing force and “select” bonded door seal applications. A maximum continuous service temperature of 275 °C is suggested. Ultrapure post cleaning and packaging is standard for all Kalrez® 8002 parts.

## Performance Features/Benefits

- Ultra-low particle generation in oxygen and fluorine-based plasmas
- Excellent (low) compression set properties
- Excellent plasma-cracking resistance
- Excellent resistance to dry process chemistry

## Suggested Applications

- Gas inlet seals
- Gas orifice seals
- Gas feedthrough seals
- “Select” bonded door seals
- Other static and low stress/low sealing force applications

## Fabs Choose DuPont™ Kalrez® 8002 for Improved Performance

Kalrez® 8002 has been reported to significantly improve wafer production in a variety of semiconductor plasma process applications where oxygen and fluorinated plasmas are used during the cleaning cycle. In a number of evaluations at fabline customers, Kalrez® 8002 exhibited improved crack resistance, lower particle generation and longer seal life compared to competitive perfluoroelastomers in both static and dynamic sealing applications.

### Case Report #6548 — Kalrez® 8002 Improved Wafer Production by 100% versus Competitive Fluoroelastomer (FKM K3)

- Oxide etch VAT pendulum valve gate seal
- Process chemistry: O<sub>2</sub>, C<sub>4</sub>F<sub>8</sub>
- Cleaning chemistry: N/A
- Competitive fluoroelastomer failed due to erosion, cracking and excessive leakage.

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

Color	Clear
Hardness, Shore A (plied slabs) <sup>2</sup>	69
Hardness, Shore M (O-ring) <sup>3</sup>	76
100% Modulus <sup>4</sup> , MPa	2.88
Tensile Strength at Break <sup>4</sup> , MPa	15.95
Elongation at Break <sup>4</sup> , %	246
Compression Set <sup>5</sup> , %, 70 hr at 204 °C	15
Max. Continuous Service Temperature <sup>6</sup> , °C	275

<sup>1</sup> Not to be used for specification purposes

<sup>2</sup> JIS 6253 test method (plied slab test specimens)

<sup>3</sup> ASTM D2240 and ASTM D1414 (AS568 K214 O-ring test specimens)

<sup>4</sup> JIS 6251 test method (dumbbell test specimens)

<sup>5</sup> ASTM D395B and ASTM D1414 (AS568 K214 O-ring test specimens)

<sup>6</sup> DuPont proprietary test method



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**Case Report #4536 — Kalrez® 8002 Improved Wafer Production Over 50% versus Incumbent Perfluoroelastomer**

- Ash top/bottom plasma tube seals
- Process chemistry: O<sub>2</sub>, CF<sub>4</sub>
- Cleaning chemistry: N/A
- Incumbent perfluoroelastomer failed due to erosion and excessive particle generation

**Case Report #6901 — Kalrez® 8002 Improved Wafer Production Over 60% versus Competitive Perfluoroelastomer (FFKM A11)**

- HDPCVD e-chuck top ring seal
- Process chemistry: SiH<sub>4</sub>, O<sub>2</sub>, He
- Cleaning chemistry: NF<sub>3</sub> plasma generated via remote plasma source
- Competitive perfluoroelastomer failed due to erosion and excessive leakage

**Case Report #7252 — Kalrez® 8002 Improved Wafer Production by Over 75% versus Incumbent Perfluoroelastomer (FFKM A2)**

- SACVD shower head, gas box and lid insulator seals
- Process chemistry: TEOS, O<sub>3</sub>
- Cleaning chemistry: NF<sub>3</sub>
- Competitive product failed due to severe erosion and melting

**Case Report #6554 — Kalrez® 8002 Exhibited Improved Crack Resistance and Lower Particle Generation versus Competitive Perfluoroelastomer (FFKM A2)**

- PECVD gas box, shower head and foreline seals
- Process chemistry: TEOS, TMB, O<sub>3</sub> at 1000 watts
- Cleaning chemistry: C<sub>3</sub>F<sub>8</sub> at 2000 watts
- Competitive perfluoroelastomer failed due to cracking and excessive leakage

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