



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

From DuPont Performance Elastomers

### Kalrez<sup>®</sup> 8002

#### Product Description

Kalrez<sup>®</sup> 8002 is a clear, transparent product targeted specifically for select semiconductor plasma and gas deposition applications, i.e. etching, ashing, HDPCVD, PECVD, SACVD, etc. This unfilled product offers ultra-low particle generation in oxygen and fluorine-based plasmas versus mineral-filled products. Kalrez<sup>®</sup> 8002 exhibits excellent resistance to dry process chemistry, has good mechanical strength properties 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 (527°F) is suggested. Ultrapure post cleaning and packaging is standard for parts made from Kalrez<sup>®</sup> 8002.

#### Performance Features/Benefits

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

#### Suggested Applications

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

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

Color	Clear transparent
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 D395B 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 Performance Elastomers proprietary test method

#### Fabs Choose Kalrez<sup>®</sup> 8002 For Improved Performance

Kalrez<sup>®</sup> 8002 has been reported to significantly improve wafer production in semiconductor HDPCVD, SACVD and PECVD applications where fluorinated plasmas, i.e., NF<sub>3</sub>, C<sub>3</sub>F<sub>8</sub>, etc. are used during the cleaning cycle. In a number of evaluations at fabline customers, Kalrez<sup>®</sup> 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 1 -- Kalrez<sup>®</sup> 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 2 -- Kalrez<sup>®</sup> 8002 Improved Wafer Production Over 50% versus Competitive Perfluoroelastomer (FFKM A11)

- HDPCVD bonded slit valve door 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 excessive leakage

## Case Report 3 -- Kalrez<sup>®</sup> 8002 Improved Wafer Production By 50% versus Incumbent Perfluoroelastomer (FFKM) and Fluoroelastomer (FKM) Products

- SACVD chamber lid, shower head, chamber body, gas box and remote plasma source seals
- Process Chemistry: TEOS, Ar, O<sub>2</sub> @ 800 watts
- Cleaning Chemistry: NF<sub>3</sub> plasma generated via remote plasma source
- Competitive products failed due to cracking and excessive leakage

## Case Report 4 -- Kalrez<sup>®</sup> 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> @ 1000 watts
- Cleaning Chemistry: C<sub>3</sub>F<sub>8</sub> @ 2000 watts
- Competitive perfluoroelastomer failed due to cracking and excessive leakage

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