

Technical Information

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Kalrez[®] perfluoroelastomer
parts

From DuPont Performance Elastomers

Kalrez[®] 8002

Product Description

Kalrez[®] 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[®] 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[®] 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 Properties¹

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

¹ Not to be used for specification purposes

² JIS 6253 test method (plied slab test specimens)

³ ASTM D395B and ASTM D1414 (AS568 K214 O-ring test specimens)

⁴ JIS 6251 test method (dumbbell test specimens)

⁵ ASTM D395B and ASTM D1414 (AS568 K214 O-ring test specimens)

⁶ DuPont Performance Elastomers proprietary test method

Fabs Choose Kalrez[®] 8002 For Improved Performance

Kalrez[®] 8002 has been reported to significantly improve wafer production in semiconductor HDPCVD, SACVD and PECVD applications where fluorinated plasmas, i.e., NF₃, C₃F₈, etc. 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 1 -- Kalrez[®] 8002 Improved Wafer Production Over 60% versus Competitive Perfluoroelastomer (FFKM A11)

- HDPCVD e-chuck top ring seal
- Process Chemistry: SiH₄, O₂, He
- Cleaning Chemistry: NF₃ plasma generated via remote plasma source
- Competitive perfluoroelastomer failed due to erosion and excessive leakage

Case Report 2 -- Kalrez® 8002 Improved Wafer Production Over 50% versus Competitive Perfluoroelastomer (FFKM A11)

- HDPCVD bonded slit valve door seal
- Process Chemistry: SiH₄, O₂, He
- Cleaning Chemistry: NF₃ plasma generated via remote plasma source
- Competitive perfluoroelastomer failed due to excessive leakage

Case Report 3 -- Kalrez® 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, O₂ @ 800 watts
- Cleaning Chemistry: NF₃ plasma generated via remote plasma source
- Competitive products failed due to cracking and excessive leakage

Case Report 4 -- 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, O₃ @ 1000 watts
- Cleaning Chemistry: C₃F₈ @ 2000 watts
- Competitive perfluoroelastomer failed due to cracking and excessive leakage

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