



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

From DuPont Performance Elastomers

### Kalrez<sup>®</sup> 8002

#### Compound Description

Kalrez<sup>®</sup> 8002 is a clear, transparent compound targeted specifically for select semiconductor plasma and gas deposition applications. This unfilled compound offers ultra-low particle generation in oxygen and fluorine-based plasmas versus mineral-filled compounds. Kalrez<sup>®</sup> 8002 exhibits excellent resistance to dry process chemistry, has good mechanical strength properties and is well suited for both static and low stress/low sealing force applications. A maximum continuous service temperature of 250°C (482°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
- Other plasma applications
- 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	250

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)

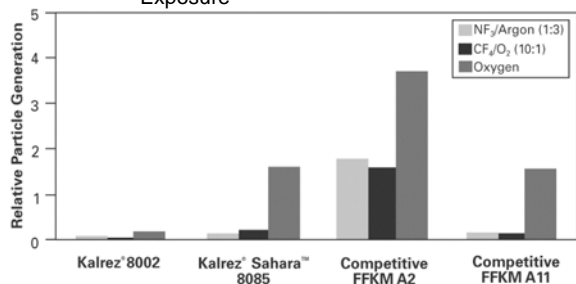
4 JIS 6251 test method (dumbbell test specimens)

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

6 DuPont Performance Elastomers proprietary test method

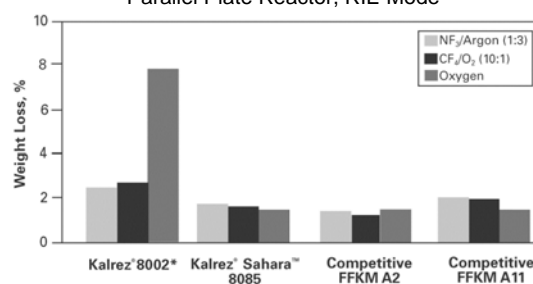
**Figure 1. Relative Particle Generation**

1 hr at 900 W, 0.1 Torr, Direct Exposure



**Figure 2. Weight Loss\*, %**

1 hr at 900 W, 0.1 Torr, Direct Exposure Parallel Plate Reactor, RIE Mode



\* Because Kalrez<sup>®</sup> 8002 is an unfilled product, weight loss is higher in certain plasmas

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

Kalrez<sup>®</sup> 8002 has been reported to significantly improve wafer production in semiconductor HDPCVD 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 an evaluation at a fabline customer, Kalrez<sup>®</sup> 8002 exhibited lower particle generation and longer seal life compared to a competitive perfluoroelastomer in several different static sealing applications.

### Kalrez<sup>®</sup> 8002 Case Report

Customer:	Large memory Fab line in Taiwan
Equipment:	AMAT Centura/DXZ
Process Type:	PECVD, BPSG
Application:	Gas Box (268), Shower Head (275), Foreline (220 and 121)
Process Gases:	TEOS, TMB, O <sub>3</sub> ; 1000 W
Cleaning Gases:	C <sub>3</sub> F <sub>8</sub> ; 2000 W
Est. Seal Temperature:	85~120°C
Chamber Pressure:	~200 Torr.
Incumbent Material:	Competitive FFKM A2
Competitive FFKM Seals:	Competitive seals showed sign of cracking/leakage at 20,000 wafer PM
Kalrez <sup>®</sup> 8002 Results:	Evaluated for 22,000 wafer cycles with no sign of cracking/leakage and improved/lower particle performance. Customer has adopted Kalrez <sup>®</sup> 8002.

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