Technical Information

Rev. 4, June 2006

Kalrez® perfluoroelastomer parts

From DuPont Performance Elastomers

Kalrez® Bonded Door Seals

Optimal Seal Design + Material Performance = Higher Wafer Yield + Lower Cost of Ownership

Bonded door seals for gate valves and slit valve door seal applications provide improved sealing performance versus conventional O-rings by reducing particle generation, extending seal life and minimizing replacement time during preventive maintenance.

Kalrez® bonded door seals are designed for easy installation and low particle generation. They combine a custom seal design and proprietary adhesion technology along with the excellent plasma resistance of Kalrez® Sahara™ 8085, 8002 and KLR-9100. The seal is held in a "fixed" position versus conventional O-rings, thereby eliminating "rolling/twisting" during door actuation. In addition, the seal design has been optimized using finite element analysis (FEA) to minimize high concentrations of localized stresses. As a result, both particle generation and sealing performance significantly improved versus conventional O-rings. Kalrez® bonded door seals are available in Kalrez® Sahara™ 8085, 8002 and KLR-9100 for etch, ash, HDPCVD, PECVD, SACVD and metal CVD wafer processing applications.

Typical Applications

Gate valves, slit valve doors, etc., currently employing an O-ring seal or dovetail seal.

Features and Benefits

Lower particle generation and extended seal life versus conventional O-rings

- Sealing element held in a 'fixed' position, i.e., eliminates "rolling/twisting" in service
- Kalrez® Sahara™ 8085, 8002 and KLR-9100 employed to minimize particle generation in reactive plasmas
- Ultrapure post-cleaning and packaging reduces unwanted contamination
- Improved sealing performance—optimal design minimizes high concentrations of localized stresses.

Less replacement time versus O-ring seals during preventive maintenance

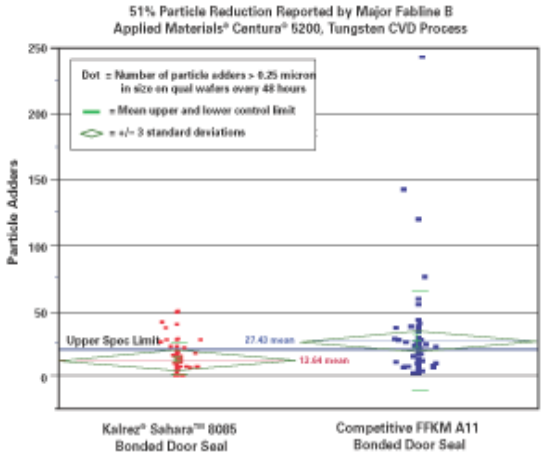
- Quick and easy assembly/disassembly to mounting bracket
- Reduces installation problems commonly experienced with O-ring seals
- Eliminates need to clean the seal gland during preventive maintenance
- Barcode on packaging plus bonded door seal part number and Kalrez® product number engraved on back of commercially available bonded door seals maintains traceability and identification plus provides assurance that it is a Kalrez® perfluoroelastomer part (FFKM).

Availability

Kalrez® bonded door seals are available to fit most major semiconductor OEM equipment platforms. In addition, a custom Kalrez® bonded door seal can be developed for most gate valve and slit valve door seal applications. Ultrapure post-cleaning and packaging is standard for all Kalrez® bonded door seals. Contact a DuPont Performance Elastomers applications engineer or an authorized Kalrez® distributor for specific size availability.

Proven Performance at Major Fablines

Case Report 1—Major Southwest Fabline, Tungsten CVD Slit Valve Door Seal Application



Case Report 2—Major Southwest Fabline, PECVD Slit Valve Door Seal Application

- Process chemistry: TEOS, O_2, N_2, He
- Cleaning chemistry: NF_3 plasma, C_2F_6 and N_2

Customer Reported Results: Kalrez®bonded doors generated 4 times less particles after 40,000 wafer cycles than an incumbent seal (competitive FFKM A11) did after only 16,500 cycles.

Case Report 3—Major Japanese Fabline, HDPCVD Slit Valve Door Seal Application

- Process chemistry: SiH_4, O_2, He
- Cleaning chemistry: NF_3 plasma via a remote plasma source

Customer Reported Results: Kalrez® 8002 bonded slit valve door seal lasted approximately 20,000 wafers without any reported performance problems. Incumbent seal (competitive FFKM A11) lasted only 12,000 wafers (1 PM cycle) before exhibiting vacuum leakage.

Case Report 4—Major European Fabline, PECVD VAT MONOVAt® bonded door application

- Process chemistry: Trimethyl Silane (TMS), O_2
- Cleaning chemistry: NF_3 plasma via remote plasma source

Customer Reported Results: No reported performance problems with a KLR-9100 VAT MONOVAT® bonded door after processing more than 55,0000 pairs of wafers. Incumbent VAT MONOVAT® bonded door (competitive FFKM F4) lasted only 30,000 pairs of wafers before exhibiting particle generation.

For further information please contact one of the offices below, or visit our website at
www.dupontelastomers.com/kalrez

Global Headquarters — Wilmington, DE USA
Tel. +1-800-853-5515
+1-302-792-4000
Fax +1-302-792-4450

European Headquarters — Geneva
Tel. +41-22-717-4000
Fax +41-22-717-4001

South & Central America Headquarters — Brazil
Tel. +55-11-4166-8978
Fax +55-11-4166-8989

Asia Pacific Headquarters — Singapore
Tel. +65-6275-9383
Fax +65-6275-9395

Japan Headquarters — Tokyo
Tel. +81-3-6402-6300
Fax +81-3-6402-6301

(06/03) Printed in U.S.A.
Reorder no: KZE-A10152-00-F0606

DuPont
Performance Elastomers