Technical Information

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Kalrez® perfluoroelastomer parts

From DuPont Performance Elastomers

KLR-9100 Preliminary Product Data Sheet

Product Description

KLR-9100 is a new, developmental product targeted specifically for semiconductor plasma and gas deposition applications, i.e., ALD, HDPCVD, PECVD, SACVD, etc. It has been specifically designed for minimal particle generation and low contamination in harsh plasma environments. It has exhibited excellent performance in HDPCVD STI and in MONOVAT® bonded door applications in PECVD Black Diamond® Processes @ Major US and European Semiconductor Fablines (see Case Reports listed on Page # 2). KLR-9100 offers outstanding thermal stability, very low outgassing and excellent mechanical strength properties and is well suited for both static and dynamic sealing applications. A maximum continuous service temperature of 300°C is suggested. Ultrapure post-cleaning and packaging is standard for all parts made from KLR-9100.

Features/Benefits

- Low erosion rate and ultra-low particle generation in oxygen and fluorine-based plasmas
- Excellent resistance to dry process chemistry
- Excellent thermal stability
- Very low outgassing properties
- Very low metals content
- Excellent (low) compression set properties
- Excellent elastic recovery properties

Suggested Applications

- Gas inlet seals
- Gas orifice seals
- Chamber lid seals
- Isolation valve seals
- Bonded slit valve door seals
- Bonded gate valves

Typical Physical Properties[1]

Property	Typical Value
Color	Amber Translucent
Hardness, Shore M[2]	74
100% Modulus[3], MPa	4.27
Tensile Strength @ Break[3], MPa	11.85
Elongation @ Break[3], %	220
Compression Set[4], %	
70 Hrs. @204°C	17
70 Hrs. @250°C	21
70 Hrs. @300°C	53
Maximum Continuous Service, Temperature[5], °C	300

[1] Not to be used for specification purposes
[2] ASTM D2240 & D1414 (AS568 K214 O-ring test specimens)
[3] ASTM D412 & D1414 (AS568 K214 O-ring test specimens)
[4] ASTM D395B & D1414 (AS568 K214 O-ring test specimens)
[5] DuPont Performance Elastomers proprietary test method

Case Report #5903 - PM Cycle Extended 3X! @ Major US Fab Line

- Fab line has extended pm cycle from 60 days to 180 days
- No evidence of erosion, leakage, mechanical damage or compression set after 180 days of service
- Equipment Platform -- Novellus Concept Two Speed®
- Process -- HDPCVD / STI
- Process Chemistry -- SiH_4, He, O_2
- Cleaning Chemistry -- NF_3 plasma @ 4000 watts
- Seal Locations -- slit valve door, inner gas manifold ring, MESC flange insert, Iso-poppet valve, turbo gate, dome lid

Case Report #6376- PM Cycle Improved 2X! @ A Major European Fab Line

- Fab line has extended pm cycle from 30,000 to >55,000 pairs of wafers
- No evidence of erosion, mechanical damage, compression set or deformation of the seal lip after processing >55,000 pairs of wafers
- Equipment Platform -- Applied Materials Producer low-k
- Process -- PECVD / Black Diamond
- Process Chemistry -- Trimethyl silane (TMS), O_2
- Cleaning Chemistry -- NF_3 plasma via remote plasma source
- Seal Location -- VAT MONOVAT® bonded door

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

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