DuPont™ Kalrez® 8900

For Semiconductor Oxidation, Diffusion, ALD, and LPCVD Applications

Technical Information - March, 2017

Product Description

DuPont™ Kalrez® 8900 perfluoroelastomer parts are a black product for oxidation, diffusion, ALD, and LPCVD applications. It offers outstanding thermal stability, very low outgassing and excellent (low) compression set properties. Kalrez® 8900 parts exhibit excellent retention of physical properties at elevated temperatures, have excellent mechanical strength and are well-suited for both static and dynamic sealing applications. A maximum application temperature of 325°C (617°F) is suggested. Short excursions to higher temperatures may also be possible. Ultrapure post-cleaning and packaging is standard for all Kalrez® 8900 parts.

Features/Benefits

- Outstanding thermal stability
- Excellent (low) compression set properties
- Very low outgassing properties
- Very low moisture content
- Excellent retention of physical properties at elevated temperatures
- Excellent resistance to fluorine gas

Suggested Applications

- Quartz Tube Seals
- Plenum Seals
- Chamber Seals
- Fittings
- Center Ring Seals

Typical Physical Properties[1]	
Color	Black
Hardness[2], Shore A (plied slab)	76
Hardness[3], Shore M (O-ring)	85
100% Modulus[4], MPa (psi)	13.33 (1933)
Tensile Strength at Break[4], MPa (psi)	20.94 (3037)
Elongation at Break[4], %	135
Compression Set[5], %	
70 hr. at 204 °C (400°F)	8
70 hr. at 300 °C (572°F)	32
70 hr. at 325 °C (617°F)	59
Max. Application Temperature[6], °C (°F)	325 (617°F)

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

[1] Kalrez® 7075UP should be used for chlorine-based Metal CVD applications

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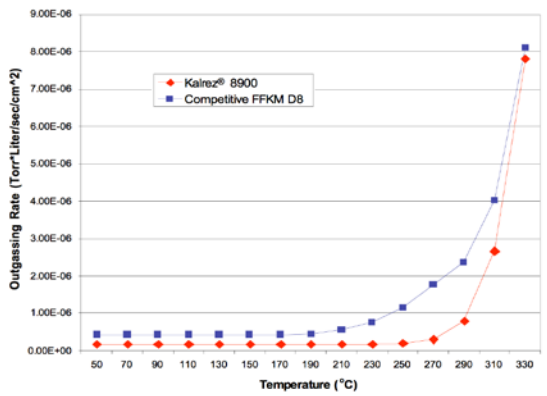
Low Outgassing of Kalrez® 8900 parts

The crosslinking structure of elastomeric seals can become damaged as a result of exposure to high heat and temperature spikes. As a result, elastomeric seals can degrade causing outgassing to occur. Outgassing from sealing materials can be absorbed by the exposed substrate and affect the properties of the grown film. Figure 1 shows the outgassing properties of Kalrez® 8900 versus a competitive perfluoroelastomer.

Figure 1. Total Outgassing (50–330°C)



Fabs Choose Kalrez® 8900 for Improved Performance

Kalrez® 8900 has been reported to significantly improve wafer production in semiconductor thermal process applications where aggressive gases are used during the cleaning cycle.

Case Report #12007 —Improved PM Performance 3x at Major US Fabline

- Exhibited less degradation than incumbent seals after 6 months in service
- Equipment Platform — Hitachi Kokusai Quixace®
- Process — Oxidation Diffusion
- Process Chemistry — H_2, O_2, N_2, N_2O
- Cleaning Chemistry — HCl
- Seal Locations — Complete Chamber O-ring kit

Visit us at **kalrez.dupont.com** or **vespel.dupont.com**

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