

Technical Information

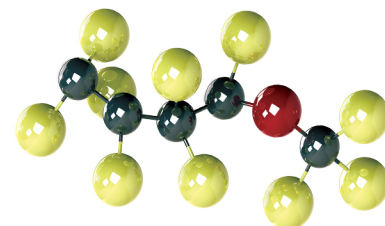


Kalrez[®] Spectrum[™]

perfluoroelastomer parts

A Product of DuPont Dow Elastomers

Kalrez[®] Sahara[™]



Compound Description

Kalrez[®] Sahara[™] G is a new, specialty compound specifically developed for gas deposition applications, i.e., HDPCVD, PECVD, etc. It has been specifically formulated for minimal particle generation in NF₃ plasma. Sahara[™] G exhibits very low particle generation and low weight loss in oxygen and fluorine plasma, has excellent mechanical properties and is well-suited for both static and dynamic sealing applications (e.g., bonded slit valve doors, bonded gate valves, gas inlets, gas orifice seals, gas feedthrough seals, etc.) A maximum continuous service temperature of 225°C is suggested. Ultrapure post-cleaning and packaging is standard for parts made from Sahara[™] G

Performance Features/Benefits

- Specifically formulated for minimal particle generation in NF₃ plasma
- Excellent oxygen and fluorine plasma resistance, i.e., very low particle generation, low weight loss, etc.
- Excellent mechanical strength properties
- Very low outgassing properties
- Good thermal stability

Suggested Applications

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

Plasma Performance

Because there is no industry standard to characterize elastomer plasma performance, OEMs and Fab lines rely on in-use testing and actual performance. To

Typical Physical Properties¹ Kalrez[®] Sahara[™] G

Property	Typical Value
Hardness, Shore A ²	82
100% Modulus ³ , MPa	7.5
Tensile Strength at Break ³ , MPa	16.3
Elongation at Break ³ , %	159
Compression Set ² , 70 hr at 150°C, %	28
Compression Set ² , 70 hr at 175°C, %	35
Compression Set ² , 70 hr at 204°C, %	42
Max. Continuous Service Temperature, °C	225

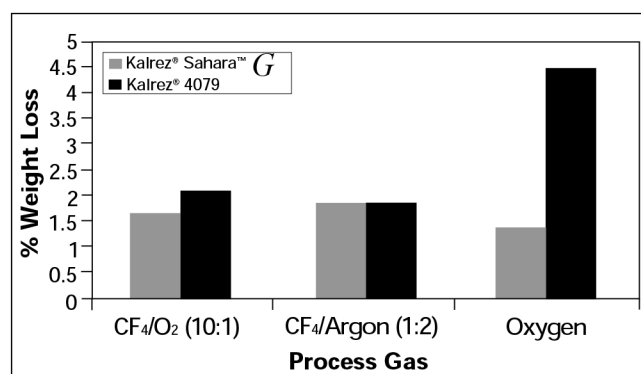
¹ Not to be used for specification purposes

² Data obtained using AS568A K214 O-rings

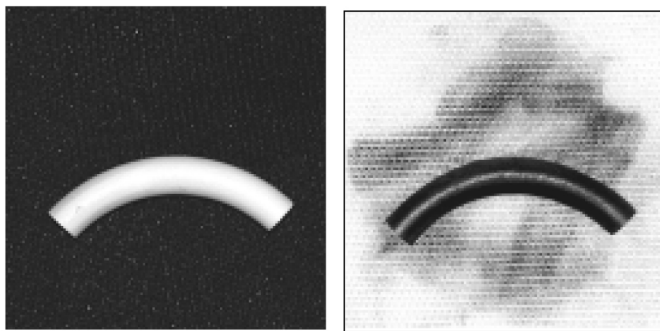
³ ASTM D412 (dumbbells specimens)

further assist the industry in proper seal selection, DuPont Dow has developed a test method that approximates chamber conditions to quantify seal resistance to plasma. In this test, O-rings are placed on a silicon wafer in a process chamber and exposed directly to the most damaging plasma environments. *Figure 1* illustrates the excellent weight loss performance of Kalrez[®] Sahara[™] G versus Kalrez[®] A2

Figure 1. % Weight Loss After 1 hr Exposure at 900 W, 0.1 Torr



Kalrez® Sahara™ G also exhibits very low particle generation upon exposure to reactive plasmas. Below are two photographs comparing the relative particle generation of Kalrez® Sahara™ G and Kalrez® A2 after exposure to CF₄/O₂ (10:1) plasma. Kalrez® Sahara™ G exhibited minimal particle generation.



**Kalrez® Sahara™ G (left) and Kalrez® A2 (right)
O-rings wiped with a lint-free cloth after 1 hr exposure
to CF₄/O₂ (10:1) plasma at 900 W, 0.1 torr.**

Proven Performance in NF₃ Plasma

Kalrez® Sahara™ G has been proven to significantly improve wafer yield in a variety of semiconductor plasma environments where NF₃ plasma was used during the cleaning cycle, wafer yield more than doubled. In numerous evaluations at fabline customers, Kalrez® Sahara™ G exhibited improved mechanical strength, lower particle generation and longer seal life compared to competitive perfluoroelastomers in both static and dynamic applications.