Kalrez® perfluoroelastomer parts
From DuPont Performance Elastomers

Kalrez® AeroSeal™ 7777

Product Description

Kalrez® AeroSeal™ 7777 is a specialty black product that meets the requirements of Aerospace Material Specification (AMS) 7257C. It offers outstanding thermal stability and compression set resistance along with excellent seal force retention properties. It also offers excellent resistance to HTS (High Thermo-Oxidative Stability) gas turbine engine lubricating oils and has excellent response to temperature cycling effects. Kalrez® AeroSeal™ 7777 has good mechanical properties and is well suited for both static and dynamic sealing applications. A maximum continuous service temperature of 325°C (617°F) is suggested. Short excursions to higher temperatures may also be possible.

Typical Physical Properties [1]

Color	Black
Hardness, Shore A[2]	75
100% Modulus[3], MPa (psi)	7.58 (1100)
Tensile Strength at Break[3], MPa (psi)	17.91 (2600)
Elongation at Break[3], %	160
Compression Set[4], 70 hr @ 204°C, %	15
Compression Set[4], 70 hr @ 300°C, %	19
Compression Set[4], 70 hr @ 325°C, %	34
Temperature of Retraction, TR10[5], °C (°F)	-4(24)
Maximum Continuous Service Temperature[6], °C (°F)	325°C (617°F)

[1] Not to be used for specification purposes
[2] ASTM D2240 (pellet test specimens)
[3] ASTM D412 (dumbbell test specimens)
[4] ASTM D1414 & D395B (AS568 K214 O-ring test specimens)
[5] ASTMD1329 (dumbbell test specimens)
[6] DuPont Performance Elastomers proprietary test method

Performance Features/Benefits

- Outstanding thermal stability
- Outstanding compression set resistance
- Excellent seal force retention properties
- Excellent resistance to high thermo-oxidative stability (HTS) gas turbine engine lubricating oils
- Excellent response to temperature cycling effects
- Good mechanical strength properties
- Lower coefficient of thermal expansion (CTE) versus other Kalrez® products thus minimizing the need to increase the free volume of the seal gland when upgrading from fluoroelastomers (FKM) to perfluoroelastomers (FKM) to Kalrez® Aeroseal™ 7777.

Comparative Compression Set Resistance[1]

Kalrez® AeroSeal™ 7777 exhibits improved resistance to compression set at elevated temperatures versus Kalrez® 4079AMS.

Test Conditions[2]	Kalrez® AeroSeal™ 7777	Kalrez® 4079AMS
336 hrs @ 204°C (400°F), %	16	38
336 hrs @ 300°C (572°F), %	34	77

[1] Not to be used for specification purposes

[2] ASTM D395B & ASTM D1414 (AS568 K214 O-ring test specimens)

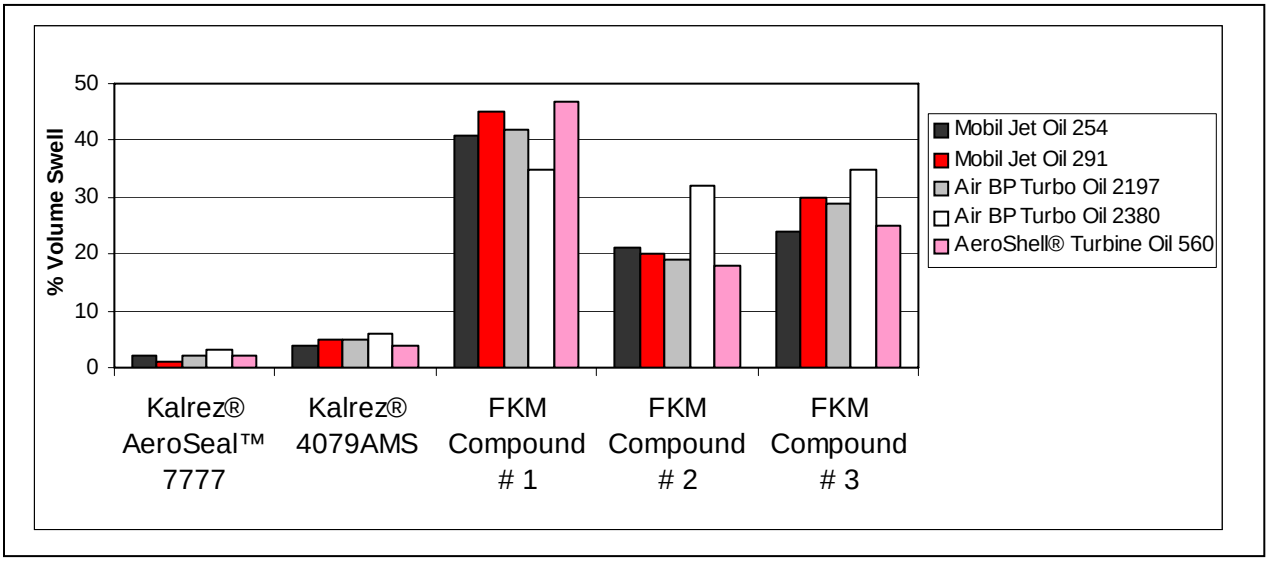
Resistance To Standard And HTS Gas Turbine Engine Lubricating Oils

For many applications, low volume swell of elastomers is critical for proper equipment operation. Excessive swell can lead to material softening, "nibbling", extrusion, etc., causing premature seal failure to occur. While other physical property testing may be needed to adequately define product performance in a particular application, volume swell has historically been used as an indicator of an elastomers' chemical resistance to a particular fluid. Figure 1 shows the long-term volume swell for Kalrez® AeroSeal™ 7777 and Kalrez® 4079AMS versus three different types of FKM compounds in both standard and HTS (High Thermo-oxidative Stability) gas turbine engine lubricating oils after 1008 hours @ 232°C (450°F). Kalrez® AeroSeal™ 7777 and Kalrez® 4079AMS exhibited significantly lower volume swell versus the FKM compounds tested.

Figure 1

Long-Term Volume Swell In Standard* & HTS Gas Turbine Engine Lubricating Oils**[1]

1008 Hours at 232°C (450°F) - Oil Changed Weekly[2]



[1] Not to be used for specification purposes

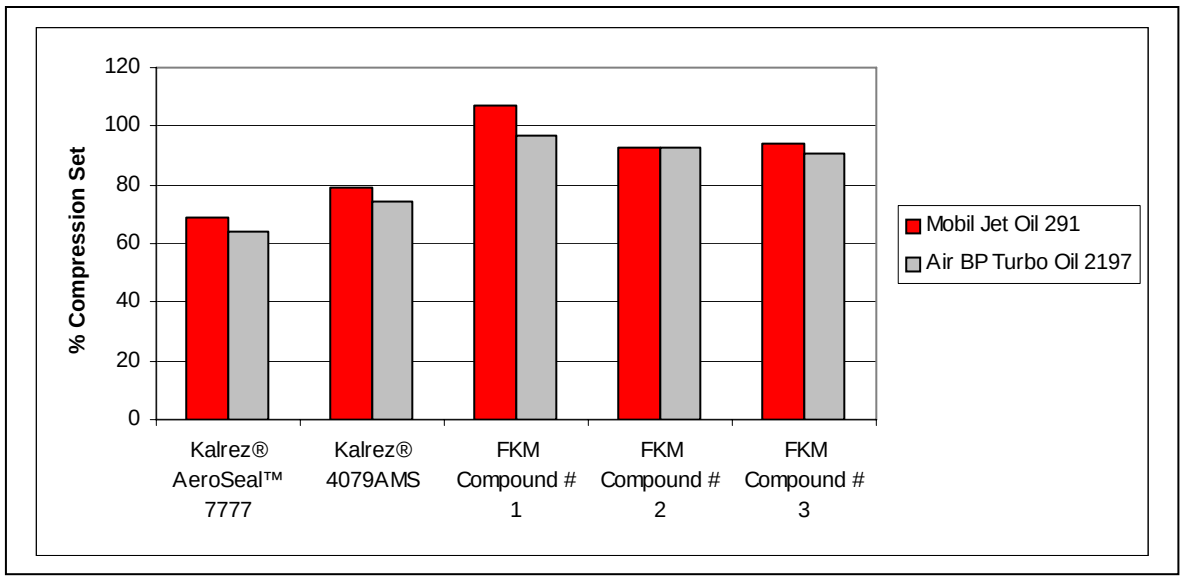
[2] ASTM D471 (dumbbell test specimens)

* Air BP Turbo Oil 2380 = standard lubricating oil

** Mobil Jet Oil 254, Mobil Jet Oil 291, Air BP Turbo 2197 & AeroShell® Turbine Oil 560 = HTS (High Thermo-Oxidative Stability) lubricating oils

Figure 2 shows the long-term compression set properties of Kalrez® AeroSeal™ 7777 and Kalrez® 4079AMS versus three different types of FKM compounds in HTS gas turbine engine lubricating oils after 1008 hours at 232°C (450°F). Kalrez® AeroSeal™ 7777 and Kalrez® 4079AMS exhibited better resistance to compression set versus the FKM compounds tested.

Figure 2
Long-Term Compression Set In HTS* Gas Turbine Engine Lubricating Oils[1]
1008 Hours at 232°C (450°F) - Oil Changed Weekly[2]



[1] Not to be used for specification purposes

[2] ASTM D395B & D1414 (AS568 K214 O-ring test specimens)

* Mobil Jet Oil 291 & Air BP Turbo Oil 2197 = HTS (High Thermo-Oxidative Stability) lubricating oils

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