Chemraz® 555

Performance-Enhanced FFKM Designed Specifically for SubFab Applications

Chemraz® 555, a perfluoroelastomer, is specifically designed to withstand the highly corrosive environments that are commonly seen in SubFab applications. Specifically in the exhaust areas of the SubFab including Pumps, Abatement systems, and piping fittings. Chemraz® 555 addresses application challenges typically found in the SubFab where temperatures and chemical exposures are high and increasing.

As device sizes have continued to shrink, the processes used to make the device features are evolving. Atomic layer processing and 3D device architectures are a few things driving changes in process chemistries and temperatures, as well as longer processing times. The more aggressive nature of these new processes also leads to more aggressive effluent gases that need to be handled in the SubFab. These changes often challenge the conventional sealing materials used in the SubFab to handle these process effluents.

Chemraz® 555 is intended to upgrade systems using conventional sealing materials such as fluoroelastomers (and others) that can no longer handle the temperatures and/or chemical exposure found in the SubFab applications. Chemraz® 555 is also intended to lower the overall Cost of Ownership of the SubFab by matching performance with application.

Features & Benefits

- Broad chemical resistance to typical SubFab effluents, including Fluorine and Oxygen
- 300°C Operating temperature capability
- Low cost of ownership, whether upgrading from FKM or looking to lower costs.
- Patent PENDING, Optimal High Temperature seal design accounts for the limitations of the KF fittings that can lead to elevated stress in the seal materials and premature failures.
- Optimized physical properties for long life in static vacuum fittings.

Applications

- ISO-KF vacuum fittings, including typical sizes: KF10, KF16, KF25, KF40, KF50, ISO63, ISO80, ISO100, ISO160, ISO200, and ISO250
- Interconnecting vacuum piping in the SubFab
- Vacuum Pumps
- Gas Abatement Systems/Scrubbers
- SubFab valves

Chemraz® 555 Properties

Typical Properties		
Description	**Chemraz® 555**	**ASTM Standard**
Physical Properties		
Color	Black	
Specific Gravity	2	D792
Hardness Type A, Points	80	D2240
Manufacturing Method	Compression Molded	
Mechanical Properties		
Tensile Strength @ Break psi (Mpa)	3,175 (24)	D1414
Elongation @ Break (%)	165	D1414
Modulus @ 50% Elongation psi (Mpa)	505 (3.5)	D1414
Modulus @ 100% Elongation (psi)/(Mpa)	1,565 (10.8)	D1414
Compression Set, 22 Hours @ 400°F (204°C), in Air, % of Original Def., Buttons	12.5	D395
Compression Set, 70 Hours @ 400°F (204°C), in Air, % of Original Def.	21.6	D395
Thermal Properties		
Service Temperature Range, °F (°C)	10°F to 600°F (-12°C to 316°C)	

Catalog & Part Numbering

Fitting Size	Fitting Size Code	Seal Assembly P/N	O-Ring P/N
KF16	016	SF016-190232-555	M0500-01800-555
KF25	025	SF025-190232-555	M0500-02800-555
KF40	040	SF040-190232-555	M0500-04200-555
KF50	050	SF050-190232-555	M0500-05500-555
ISO63	063	SF063-190233-555	M0500-07600-555
ISO80	080	SF080-190233-555	M0500-08900-555
ISO100	100	SF100-190233-555	M0500-10800-555
ISO160	180	SF160-190233-555	M0500-15600-555
ISO200	200	SF200-190233-555	M0500-21600-555

Chemical Compatibility Guide

Chemical Name	Chemical Formula	Chemraz® 555	FKM
Ammonium Fluoride	NH_4F	E	G
Acetylene	C_2H_2	E	E
Ammonia	NH_3	E	P
Argon	Ar	E	E
Arsenic Chloride	AsCl	E	P
Arsenic Trichloride	$AsCl_3$	E	P
Arsine	AsH_3	E	F
Boron Tribromide	BBr_3	E	E
Boron Trichloride	BCl_3	E	E
Boron Trifluoride	BF_3	G	E
Bromine	Br	G	E
Carbon Dioxide	CO_2	E	G
Carbon Tetrachloride	CCl_4	G	E
Carbon Tetrafluoride	CF_4	G	E
Chlorine	Cl_2	G	E
Chloropenta	C_2F_5Cl	G	E
Dichloro Difluoro	CCl_2F_2	G	G
Dichloro Silane	SiH_2Cl_2	E	G
Dimethylamine (DMA)	$(CH_3)_2NH$	G	P
DiSilane	Si_2H_6	E	G
Difluoro Ethane	CH_3CHF_2	G	P
Fluorine	F_2	E	G
Fluoroform (F-23)	CHF_3	E	P
Germanium	GeH_4	E	G
Helium	He	E	E
Hexachloro Disilane	Si_2Cl_6	E	G
Hexafluoro Ethane	S_2F_6	G	G
Hydrogen	H_2	E	E
Hydrogen Bromide	HBr	E	E

Chemical Name	Chemical Formula	Chemraz® 555	FKM
Hydrogen Chloride	HCl	G	E
Hydrogen Fluoride	HF	E	P
Hydrogen Selenide	H_2Se	E	F
Hydrogen Sulfide	H_2S	G	P
Methyl Chloride	CH_3Cl	E	E
Monomethylamine	CH_5N	G	F
Nitrogen	N_2	E	E
Nitrogen Trifluoride	NF_3	E	G
Nitrous Oxide	N_2O	E	E
Oxygen	O_2	E	P
Ozone	O_3	E	E
Perfluoro-propane	C_3F_8	G	P
Phosphine	PH_3	E	F
Phosphorous Trifluoride	PF_3	E	E
Potassium Hydroxide	KOH	F	P
Silane	SiH_4	E	G
Silicon Tetrachloride	$SiCl_4$	G	G
Silicon Tetrafluoride	SiF_4	G	P
Silicon Trifluoride	SiF_3	G	P
Sodium Hydroxide	NaOH	F	G
Sulfur Hexafluoride	SF_6	G	F
Tetraethylorthosilicate (TEOS)		E	E
Tetrafluoromethane (F-14)	CF_4	E	E
Trichloroethane	$C_2H_3Cl_3$	E	E
Trichlorosilane	$SIHCl_3$	E	E
Trifluoromethane	CHF_3	E	G
Trimethylamine	$(CH_3)_3N$	G	P
Trisilane	Sl_3H_6	E	G
Tungsten Hexafluoride	WF_6	E	F

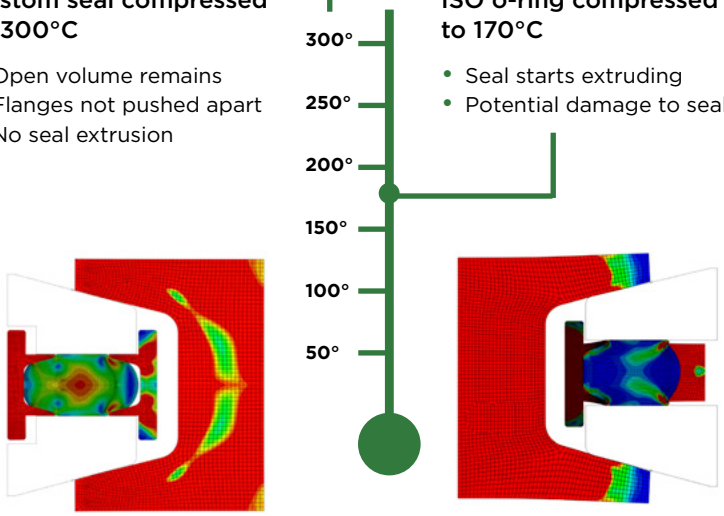
E=Excellent | G=Good | F=Fair | P=Poor

Chemraz® 555
Custom seal compressed to 300°C

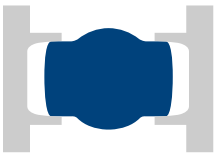
- Open volume remains
- Flanges not pushed apart
- No seal extrusion

ISO Standard
ISO o-ring compressed to 170°C

- Seal starts extruding
- Potential damage to seal



Product comparison by temperature resistance



KF Custom Seals
(High Temp)

KF Standard and Custom O-ring

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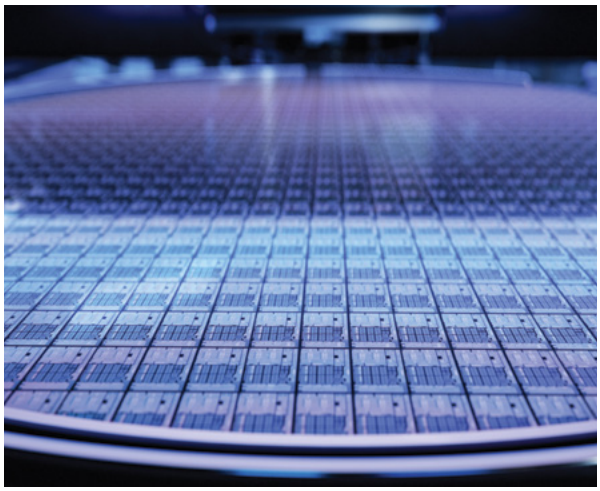

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