



V75RF



Fluorosurfactant-free food contact fluoroelastomer

V75RF is a fluorosurfactant-free alternative to V75SR, a PPE grade recommended for high performance sealing applications in food contact environments. V75RF's superior steam resistance makes the material ideal for use in Stage II Sterilization processes, with FDA and

USP Class VI compliance, and exceptional chemical resistance and mechanical strength.

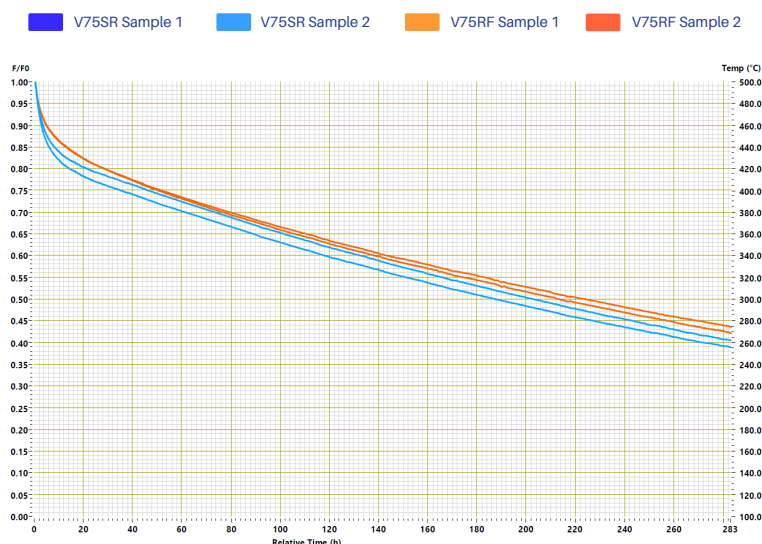
V75RF is an alternative sealing material to the legacy V75SR, which makes use of a new FKM manufacturing process that does not require the use of fluorinated surfactants.

Extensive testing has been carried out which shows, as detailed in this document, some strong alignment between the original and NFS (non-fluorosurfactant) versions from a thermal and mechanical perspective.

Material Properties	Method	V75SR	V75RF
Hardness (Shore A)	ASTM D2240	69	68
Hardness (IRHD)	ASTM D1415	69	70
Density (g/cm ³)	ASTM D792	1.91	1.91
Tensile Strength (MPa)	ASTM D412	26	26
Elongation at Break (%)		227	266
Modulus @ 50% (MPa)		2.61	2.07
Modulus @ 100% (MPa)		7.40	5.61
Compression Set% (72h @ 200°C / 392°F)	ASTM D395 Method B	24	27

Table comparing typical properties of original material against new NFS version

Thermal Performance: (High Temperature)



High temperature performance has been compared using compressive stress relaxation ISO 3384-1 Method B at a constant temperature of 200°C (410°F) for 168 hours with -214 O-Rings under 25% compression.

The results show a high degree of correlation between the original and NFS materials under these conditions.

Stress relaxation is a reduction in the counterforce for maintaining the applied strain; the force is not constant but decreases with time when the material ages.



V75RF is part of PPE's range of fluorosurfactant-free fluoroelastomer materials. It has been developed to be more environmentally sustainable.



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Thermal Expansion:

The Coefficient of thermal expansion (CTE) has been compared using a thermomechanical analyser (TMA).

The results show a good degree of correlation between the original and NFS materials.

Material Grade	Coefficient of Thermal Expansion $\mu\text{m}/(\text{m } ^\circ\text{C})$
V75SR	238 $\mu\text{m}/(\text{m } ^\circ\text{C})$
V75RF	228 $\mu\text{m}/(\text{m } ^\circ\text{C})$

TMA: Comparable Coefficient of Thermal Expansion

Thermal Performance: (Low Temperature)

Low temperature flexibility has been compared using the midpoint Glass Transition Temperature (T_g) obtained through Differential Scanning Calorimetry (DSC) ASTM D3148.

The results show a high degree of correlation between the original and NFS materials.

Material Grade	Glass Transition Temperature ($^\circ\text{C}$)
V75SR	-4.9 $^\circ\text{C}$ / 23.2 $^\circ\text{F}$
V75RF	-4.6 $^\circ\text{C}$ / 23.7 $^\circ\text{F}$

DSC: Comparable Glass Transition Temperature

Material Certifications

The V75RF fluorosurfactant-free material has the same food contact certifications as the legacy V75SR material.

There is no regulatory risk associated with a switch from V75SR to V75RF.

Certification	V75SR	V75RF
FDA 21CFR177.2600	A-F	A-F
USP <87>	PASS	PASS
USP <88>	PASS	PASS
3A 18-03	CLASS 1	CLASS 1
BfR XXI	PASS	PASS