Viton™ GF-200S A

Fluoroelastomers

Product Information

Introduction

Viton™ GF-200S A fluoroelastomer is a 70% fluorine, peroxide-cured fluoroelastomer similar to Viton™ GF-600S A, but with a significantly lower gum polymer viscosity of ~25 (ML at 121 °C (250 °F)). Viton™ GF-200S A utilizes the latest Advanced Polymer Architecture (APA) and FWRD technologies from Chemours, enabling high performance in the most critical applications, without the use of a fluorinated surfactant during production.

Features

- Excellent fluid resistance to aromatic hydrocarbons and alcohols, including methanol and ethanol, biodiesel, oils, hot water and steam, as well acids
- Compatible with latest EV fluids, (oils and coolants, transmission, and thermal fluids) as well as most common battery electrolytes
- Excellent physical properties with high elongation, both original and aged in standard compounds and in formulations with no or low filler, even after aging
- Outstanding compression set resistance with either low or no post-cure
- Ideal for blending with Viton™ GF-600S A to reach intermediate viscosity ranges for injection molding
- Manufactured without fluorinated surfactant

Compounding and processing

- Viton™ Curative No. 7 (VC-7) is the suggested coagent for all Viton™ GF-200S A compounds and is usually used at a 2.5 phr level or lower, unless high modulus is needed. High levels of VC-7 can bleed out and cause molding flaws.
- The use of TMAIC (trimethallyl isocyanurate) is not suggested, as it causes poor mold release and high compression set.
- 2,5-Bis(*tert*-butylbutoxy)-2,5-dimethylhexane is used commonly as crosslinking peroxide, often as 45% active free flowing powder on a silica/calcium carbonate carrier. Typical levels are 1.5 phr or lower. Based on a DoE (Design of Experiment) study, a good balance of cure speed and properties can be achieved with 1.7 phr VC-7 and 1.3 phr peroxide.
- The suggested process aids for Viton™ GF-200S A are Struktol® HT-290, either alone or in combination with Struktol® WS-280 (recommended level 0.75 to 1.0phr). Armeen® 18D or PAT®-44/04 are also suitable for use with Viton™ GF-200S A compounds.
- Viton™ GF-200S A can be easily compounded on hot roll mills as well as in internal mixers (recommended >72% load factor for the latter)

Safety and Handling

Before handling or processing Viton™ GF-200S A, be sure to read and be guided by the suggestions in the Chemours technical bulletin, “Handling Precautions for Viton™ and Related Chemicals.”

Product Description

Viton™ GF-200S A	
Chemical Composition	Terpolymer of hexafluoropropylene, vinylidene fluoride, tetrafluoroethylene, and a proprietary cure site monomer
Physical Form	Sheet
Appearance	Off-white to tan
Odor	None
Mooney Viscosity, ML 1 + 10 at 121 °C (250 °F)	25
Specific Gravity	1.90
Storage Stability	Excellent
Fluorine, %	~70

Table 1. General properties of Viton™ GF-200S A

Compound	phr
Viton™ GF-200S A	100
Thermax® Floform N990	30
Zinc Oxide	3
Viton™ Curative No. 7 (VC-7)	2.2
Luperox® 101 XL 45	1.5
Struktol® HT 290	1
Rheological Properties	
Mooney Viscosity, ML 1+10 at 121 °C (250 °F)	
Final Mooney, MU	35
Mooney Viscosity, ML 1+4 at 100 °C (212 °F)	
Final Mooney, MU	56
MDR Cure Rate - 180 °C (356 °F) / 6 min / arc 0.5°	
ML, dNm	0.91
MH, dNm	26.1
Ts1, min	0.46
Ts2, min	0.50
T10, min	0.51
T50, min	0.72
T90, min	1.30
Mooney Scorch - 135 °C (275 °F) / 45 min	
Initial Mooney, MU	33
Minimum Mooney, MU	15
Ts1, min	5.7
Ts2, min	5.7
T5, min	7.4
T10, min	8.1
T35, min	9.9
Low Temperature Properties	
Tg by DSC - Polymer	
Tg, °C	-6
Temperature Retraction – Press Cure: 10 min / 180°C (356 °F), Post-Cured: 16 hr / 230 °C (446 °F)	
TR10, °C	-5
TR30, °C	-2

Vulcanizate Properties Press Cure: 10 min / 180 °C (356 °F)	Post-Cured: None	Post-Cured: 4 hr / 200 °C (392 °F)	Post-Cured: 16 hr / 230 °C (446 °F)
Hardness Shore A, 1 sec			
Shore A, pts	73	76	80
Tensile Properties, Type 2, at 23 °C (73 °F)			
Tensile Strength, MPa	10.6	12.9	19.5
Elongation at Break, %	340	310	250
Modulus at 100%, MPa	3.2	3.8	5.7
Tear Strength			
Tear Strength Type A - Trouser Test Pieces			
Tear Strength, kN/m	4.9	5.2	5.8

Compression Set Properties: Curing conditions: 10 min / 180 °C (356 °F)	Post-Cured: None	Post-Cured: 4 hr / 200 °C (392 °F)	Post-Cured: 16 hr / 230 °C (446 °F)
Compression Set, 70 hr at 200 °C (392 °F), Type B			
Compression Set, %	32	27	24
Compression Set, 168 hr at 200 °C (392 °F), Type B			
Compression Set, %	47	42	36
Compression Set, VW, 94 hr at 180 °C (356 °F)			
Compression Set at 5 sec, %	-	-	57
Compression Set at 30 min, %	-	-	44

Table 2. Aging Properties of Viton™ GF-200S A

Aging Properties	
Post-Cured: 16 hr / 230 °C (446 °F)	
Heat Aging, 168 hr at 250 °C (482 °F)	
Hardness Shore A, 1 sec	
Shore A, pts	79
Delta Hardness, pts	-2
Tensile Properties, Type 2, at 23 °C (73 °F)	
Tensile Strength, MPa	15.8
Delta TS, %	-19
Elongation at Break, %	370
Delta Elongation, %	+47
Modulus at 100%, MPa	4.4
Delta 100%, %	-23
Fluid Aging, 168 hr at 150 °C (302 °F) in Motul® ATF VI (Dexron® VI)	
Hardness Shore A, 1 sec	
Shore A, pts	77
Delta Hardness, pts	-4
Tensile Properties, Type 2, at 23 °C (73 °F)	
Tensile Strength, MPa	20.0
Delta TS, %	+3
Elongation at Break, %	290
Delta Elongation, %	+15
Modulus at 100%, MPa	5.1
Delta 100%, %	-10
Weight & Volume Change	
Weight Change, %	0.8
Volume Change, %	1.4

Table 3. Compound Ingredients

Compound	Supplier
Thermax® Floform N990	Cancarb Limited
Zinc Oxide (99% pure, 5 microns)	Sigma-Aldrich
Viton™ Curative No. 7 (VC-7)	The Chemours Company
Luperox® 101 XL 45	Arkema
Struktol® HT 290	Schill+Seilacher

Table 4. Test Procedures

Property Measured	Test Procedure
Compression Set	ISO 815-1:2019
Compression Set VW	VW PV 3307:2004-08
Hardness	ISO 48-4:2018
MDR (moving die rheometer)	ISO 6502-3:2023
Mooney Viscosity	ISO 289-1:2015
Mooney Scorch	ISO 289-2:2020
DSC (differential scanning calorimetry)	ISO 22768:2020
Temperature Retraction	ISO 2921:2019
Fluid Aging	ISO 1817:2022
Heat Aging	ISO 188:2023
Stress/Strain Properties	ISO 37:2024
Tear Strength	ISO 34-1:2022

Test temperature is 23 °C (73 °F), except where specified otherwise.

For more information, visit viton.com

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