Viton™ GLT-200S

Fluoroelastomers

Technical Information

Introduction

Viton™ GLT-200S* fluoroelastomer is a 64% fluorine, peroxide-cured, low temperature fluoroelastomer similar to Viton™ GLT-600S, but with a significantly lower gum polymer viscosity of ~25 (ML at 121 °C [250 °F]). GLT-200S utilizes the latest technology from Chemours, Advanced Polymer Architecture (APA), which includes a novel peroxide cure site along with an optimized molecular weight distribution.

Features

- Cures exceptionally fast to a high state of cure
- Is ideal for blending with Viton™ GLT-600S to reach intermediate viscosity ranges for injection molding
- Improved mold release/mold fouling properties
- Improved mold flow and less shear sensitivity than 65 Mooney Viton™ GLT-600S
- Excellent physical properties with high elongation, both original and aged
- Heat, fluids, and low temperature resistance comparable to Viton™ GLT-600S
- Improved water resistance/lower volume swell in water
- Excellent compression set resistance with either low or no post-cure

Processing

A load factor of 72%+ for internal mixing of GLT-200S is recommended. The suggested process aids for GLT-200S are 0.75 phr of Struktol® HT290, either alone or in combination with 0.5 phr of PAT-777, or combinations of 0.5 phr Armeen® 18D with carnauba wax or Struktol® WS280. The use of TMAIC (trimethallyl isocyanurate) is NOT suggested, as it causes poor mold release and high compression set. Viton™ Curative No. 7 (VC-7) is the suggested coagent for all GLT-200S compounds and 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.

Safety and Handling

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

Product Description

Chemical Composition	Copolymer of perfluoromethylvinyl ether, vinylidene fluoride, and tetrafluoroethylene with a cure site monomer
Physical Form	Sheet
Appearance	White to tan
Odor	None
Mooney Viscosity, ML 1 + 10 at 121 °C (250 °F)	25
Specific Gravity	1.80
Storage Stability	Excellent
Fluorine, %	~64

*Viton™ GLT-200S was formerly named VTR-8505.

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Table 1. General Properties of Viton™ GLT-200S Compared with Viton™ GLT-600S

	Viton™ GLT-200S	50/50 Blend	Viton™ GLT-600S
ML-10 at 121 °C (250 °F) (gum polymer)	20	51	66
Viton™ GLT-200S	100	50	—
Viton™ GLT-600S	—	50	100
Zinc Oxide	3	3	3
N990	30	30	30
Viton™ Curative No. 7 (VC-7)	3	3	3
Varox® DBPH-50	3	3	3
Total	139	139	139
Mooney Scorch at 121 °C (250 °F)			
Minimum	13	27	45
2 Pt. Rise, min	28.9	26.3	21.7
5 Pt. Rise, min	>30	28.8	23.8
10 Pt. Rise, min	—	>30	25.8
ODR at 162 °C (324 °F), 3° Arc, 100 Range, 30 Min Clock			
M-L, dNm	5	13	25
ts-2, min	1.4	1.3	1.2
t'50, min	2.8	2.7	2.7
t'90, min	4.4	4.3	5.1
M-H, dNm	136	138	127
MDR 2000 at 177 °C (350 °F), 0.5° Arc, 100 Range, 6 Min Clock			
M-L, dNm	0.5	1.4	2.6
ts-2, min	0.4	0.4	0.4
t'50, min	0.6	0.6	0.7
t'90, min	1.0	1.0	1.1
t'95, min	1.3	1.3	1.5
M-H, dNm	29.1	28.0	26.4
Rosand Capillary Rheometer at 100 °C (212 °F), 1.5 mm die—L/D = 0/1 and 10/1			
Shear Rate (sec^{-1})			
113	3.1	4.7	5.3
452	5.0	6.1	6.9
1,129	6.5	7.7	8.3
2,221	7.9	9.3	10.0
Spider Mold Flow Test—Sprue 0.8 mm (0.031 in)—Transfer Pressure 103 bar—(Cured 7 min at 177 °C [350 °F])			
Total Shot Weight, g	31.7	32.0	31.8
Weight of Spider, g	24.8	14.5	9.8
Fill Factor, %	78	45	31

continued

Table 1. General Properties of Viton™ GLT-200S Compared with Viton™ GLT-600S (continued)

	Viton™ GLT-200S	50/50 Blend	Viton™ GLT-600S
Physical Properties at RT—Original (Cured 7 min at 177 °C [350 °F]—No post-cure)			
M-10, MPa	0.63	0.72	0.7
M-100, MPa	3.1	3.4	3.2
Tensile, MPa	11.4	12.4	13.8
T-B, psi	1,656	1,795	2,001
Elongation, %	256	292	310
Hardness, A, pts	66	66	64
"Hot" Tear Strength at 150 °C (302 °F)—Original (Cured 7 min at 177 °C [350 °F]—No post-cure)			
Tear Die B (nicked), N/mm	9.4	10.1	10.6
Physical Properties at RT—Original (Cured 7 min at 177 °C [350 °F]—Post-cured at 232 °C [302 °F] as noted)			
	2 hr	*2 hr*	*2 hr*
M-10, MPa	0.7	0.8	0.6
M-100, MPa	3.7	3.9	3.5
Tensile, MPa	16.2	18.2	18.4
T-B, psi	2,350	2,642	2,671
E-B, %	254	298	308
Hardness, A, pts	68	67	67
Compression Set, Method B, O-Rings			
22 hr at 200 °C (392 °F)			
– Post-cured at 232 °C (450 °F)	13	11	13
70 hr at 200 °C (392 °F)			
– No Post-cure	23	26	25
– Post-cured at 232 °C (450 °F)	20	20	20
Low Temperature Testing			
Tg by DSC, °C	–32.8	–32.9	–32.8
Physical Properties at RT—Heat Aged 70 hr at 250 °C (482 °F) in Oven			
M-10, MPa	0.7	0.8	0.7
% Change, M10	0	–1	7
M-100, MPa	3.3	3.6	3.1
% Change, M100	–9	–9	–11
Tensile, MPa	19.5	19.2	18.2
% Change, T-B	20	6	–1
Elongation, %	328	325	346
% Change, E-B	29	9	12
Hardness, A, pts	67	67	67
Pts Change	–1	0	0

continued

Table 1. General Properties of Viton™ GLT-200S Compared with Viton™ GLT-600S (continued)

	Viton™ GLT-200S	50/50 Blend	Viton™ GLT-600S
Physical Properties at RT—Heat Aged 70 hr at 275 °C (527 °F) in Oven			
M-10, MPa	0.7	0.8	0.7
% Change, M10	3	5	5
M-100, MPa	3.8	3.7	3.2
% Change, M100	4	−5	−10
Tensile, MPa	13.6	13.8	13.7
% Change, T-B	−16	−24	−26
Elongation, %	250	273	307
% Change, E-B	−2	−8	0
Hardness, A, pts	67	67	67
Pts Change	−1	0	0
Physical Properties at RT—Aged 168 hr at 150 °C (302 °F) in ASTM #105 Oil (5W/30)			
M-10, MPa	0.8	0.8	0.8
% Change, M10	15	8	34
M-100, MPa	3.9	4.1	4.3
% Change, M100	7	5	22
Tensile, MPa	8.9	8.6	8.6
% Change, T-B	−45	−53	−53
Elongation, %	165	156	158
% Change, E-B	−35	−47	−49
Hardness, A, pts	70	69	69
Pts Change	2	2	2
Volume Swell, %	0.7	0.8	0.7
Fluid Immersions—Volume Swell			
Fuel C, 168 hr at 23 °C (73 °F)	8.6	8.3	8.6
CM15 Fuel, 168 hr at 23 °C (73 °F)	32.0	36.4	28.8
Distilled Water, 168 hr at 100 °C (212 °F)	3.9	3.8	3.2

Test Procedures

Property Measured	Test Procedure
Compression Set	ASTM D395, Method B (25% deflection)
Compression Set, O-Rings	ASTM D395, Method B (25% deflection)
Hardness	ASTM D1414, durometer A
Mooney Scorch	ASTM D1646, small rotor at 121 °C (250 °F)
Mooney Viscosity	ASTM D1646, ten pass at 121 °C (250 °F)
ODR (oscillating disk rheometer)	ASTM D2084
Property Change After Heat Aging	ASTM D573
Stress/Strain Properties 100% Modulus Tensile Strength (T-B) Elongation (E-B)	ASTM D412, pulled at 8.5 mm/sec (20 in/min)
Temperature Retraction (TR-10)	ASTM D1329
Volume Change in Fluids	ASTM D471

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

For more information, visit Viton.com

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Replaces: VTE-A10348-00-C0710
C-10952 (9/20)