Viton™ GBL-200S

Fluoroelastomers

Technical Information

Introduction

Viton™ GBL-200S* fluoroelastomer is a next generation, easy processing, low viscosity, peroxide cured 68% fluorine fluoroelastomer based on new Advanced Polymer Architecture technology. Compared with the original Viton™ GBL-200, Viton™ GBL-200S shows better processability coupled with similar or improved fluids resistance in aromatic hydrocarbons, alcohols, water, steam, and acids.

Features

- Is ideal for blending with Viton™ GBL-600S to reach intermediate viscosity ranges
- Cures exceptionally fast to a high state of cure
- Exhibits improved mold release/mold fouling properties compared with Viton™ GBL-900 and Viton™ GBL-200
- Exhibits improved mold flow and less shear sensitivity than 65 Mooney Viton™ GBL-600S
- Exhibits excellent physical properties with high elongation, both original and aged compounds
- Exhibits similar heat, fluids, and low temperature resistance compared with Viton™ GBL-200
- Exhibits excellent compression set resistance with little (2 hr) or no post-cure

Processing

A load factor of >70% for internal mixing of Viton™ GBL-200S is recommended. The recommended process aids for Viton™ GBL-200S are 1 phr of Struktol® HT 290, combinations of 0.5 phr Armeen® 18D with carnauba wax, or Struktol® WS 280. Viton™ Curative No. 7 (VC-7) co-agent is recommended for all Viton™ GBL-200S compounds. Used at a level of 2.5 phr or less is satisfactory, unless high modulus is needed. At higher levels, VC-7 can bleed out and cause molding flaws.

Safety and Handling

Before handling or processing Viton™ GBL-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 hexafluoropropylene, vinylidene fluoride, and tetrafluoroethylene with a 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	1.84
Storage Stability	Excellent
Fluorine, %	~68

*Viton™ GBL-200S was formerly named VTR-8655.

Chemours™

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

	Viton™ GBL-200	Viton™ GBL-200S	50/50 Blend	Viton™ GBL-600S
Viton™ GBL-200	100	—	—	—
Viton™ GBL-200S	—	100	50	—
Viton™ GBL-600S	—	—	50	100
Zinc Oxide	3	3	3	3
N990 (MT Black)	30	30	30	30
Viton™ Curative No. 7 (VC-7)	3	3	3	3
Varox® DBPH-50	3	2	2	2
Total phr	139	138	138	138
Mooney Scorch at 121 °C (250 °F)				
Minimum, MU	18	19	27	35
2 pt rise, min	26.2	>30	>30	>30
5 pt rise, min	29.0	—	—	—
10 pt rise, min	>30	—	—	—
ODR at 162 °C (324 °F), 3° arc, 100 range, 30 min clock				
M_L, dN.m	8	7	10	14
t_s2, min	1.4	1.7	1.7	1.6
t'50, min	3.0	3.1	3.1	3.1
t'90, min	9.8	4.7	4.6	4.8
M_H, dN.m	114	150	141	132
MDR 2000 at 177 °C (351 °F), 0.5° arc, 100 range, 6 min clock				
M_L, dN.m	0.7	0.6	1.0	1.5
t_s2, min	0.5	0.5	0.5	0.5
t'50, min	0.7	0.7	0.7	0.7
t'90, min	1.9	1.1	1.1	1.1
t'95, min	2.7	1.4	1.4	1.4
M_H, dN.m	18.3	30.4	29.3	27.9
Rosand Capillary Rheometer at 100 °C (212 °F), 1.5 mm die, L/D = 0/1 and 10/1				
Piston Speed, mm/min	*Shear Rate, sec^{-1}*	*Pressure (L/D = 0/1 die), MPa*		
12.7	113.1	4.2	4.0	4.7	4.1
50.8	451.7	6.2	5.7	5.7	6.0
127	1,128.7	7.9	7.2	7.4	7.7
250	2,222.1	10.0	8.6	8.9	9.4
Physical Properties at RT—Original (Cured 5 min at 177 °C [351 °F]—No post-cure)				
M10, MPa		0.7	0.7	0.7	0.7
M100, MPa		3.4	3.2	3.4	3.1
Tb, MPa		12.6	13.2	13.4	13.0
Eb, %		291	319	337	314
Hardness, A, pts		66	67	67	66
Hot Tear Die B at 150 °C (302 °F)—Original (Cured 7 min at 177 °C [351 °F]—No post-cure)				
Die B, nicked, N/mm		9.1	10.3	10.7	10.8

continued

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

	Viton™ GBL-200	Viton™ GBL-200S	50/50 Blend	Viton™ GBL-600S
Physical Properties at RT—Original (Cured 5 min at 177 °C [351 °F]—Post-cured at 232 °C [450 °F])				
	16 hr	*4 hr*	*4 hr*	*4 hr*
M10, MPa	0.8	0.7	0.8	0.7
M100, MPa	5.4	4.2	4.4	3.7
Tb, MPa	20.6	19.6	20.1	17.6
Eb, %	247	289	317	278
Hardness, A, pts	70	70	70	69
Physical Properties at RT—Heat aged 70 hr at 250 °C (482 °F) in oven (slabs post-cured)				
M10, MPa	0.8	0.8	0.7	0.8
M100, MPa	4.5	3.8	3.7	3.7
Tb, MPa	18.7	19.7	18.9	18.8
Eb, %	322	360	366	372
Hardness, A, pts	70	70	70	70
Pts change	0	0	0	1
% change, M10	8	10	–4	10
% change, M100	–16	–10	–16	0
% change, Tb	–9	1	–6	7
% change, Eb	30	24	16	34
Physical Properties at RT—Heat aged 70 hr at 275 °C (527 °F) in oven				
M10, MPa	0.7	0.7	0.8	0.6
M100, MPa	3.3	3.3	3.2	3.0
Tb, MPa	12.1	14.4	13.3	12.3
Eb, %	327	343	373	423
Hardness, A, pts	69	69	70	69
Pts change	–1	–1	0	0
% change, M10	–8	–4	–1	–10
% change, M100	–38	–23	–27	–20
% change, Tb	–41	–27	–34	–30
% change, Eb	32	19	18	52
Fluid Immersions—Volume swell—tested 168 hr at 23 °C (73 °F)				
Fuel C, 168 hr at 23 °C (73 °F)	4.0	4.2	4.1	4.0
M15 Fuel, 168 hr at 23 °C (73 °F)	23	22	22	21
Methanol, 168 hr at 23 °C (73 °F)	57	53	51	47
Water, 168 hr at 100 °C (212 °F)	8.2	4.4	4.9	4.6
Compound Specific Gravity	1.860	1.861	1.861	1.863
Compression Set, Method B, O-Rings, 22 hr at 200 °C (392 °F)				
No post-cure	37	14	14	16
Post-cured at 232 °C (450 °F)	29	11	14	14
Low Temperature Testing				
Tg by MDSC, post-cured, °C	–17.4	–18.8	–18.1	–17.2

Test Procedures

Property Measured	Test Procedure
Compression Set	ASTM D3955, Method B (25% deflection)
Compression Set—Low Temperature	ASTM D1299, Method B (25% deflection)
Compression Set, O-Rings	ASTM D1414
Hardness	ASTM D2240, durometer A
Mooney Scorch	ASTM D1646, using the small rotor. Minimum viscosity and time to a 1-, 5-, or a 10-unit rise are reported.
Mooney Viscosity	ASTM D1646, ten pass 100 °C (212 °F) and 121 °C (250 °F)
ODR (vulcanization characteristics measured with an oscillating disk cure meter)	ASTM D2084
Property Change After Oven Heat-Aging	ASTM D573
Stress/Strain Properties 100% Modulus Tensile Strength Elongation at Break	ASTM D412, pulled at 8.5 mm/sec (20 in/min)
Stiffness, Torsional, Clash-Berg	ASTM D1043
Temperature Retraction	ASTM D1329
Volume Change in Fluids	ASTM D471

Test temperature is 24 °C (75 °F), except where specified otherwise.

For more information, visit Viton.com

Replaces: VTE-A10165-00-C0710
C-10954 (9/20)