

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, or combinations of 0.5 phr Armeen® 18D with carnauba

wax, or Struktol® WS 280. Diak™ #7 (TAIC) 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, TAIC 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.

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
Diak™ 7 (TAIC)	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				
<i>Piston Speed, mm/min</i>	<i>Shear Rate, sec⁻¹</i>		<i>Pressure (L/D = 0/1 die), MPa</i>	
12.7	113.1	4.2	4.0	4.7
50.8	451.7	6.2	5.7	5.7
127	1128.7	7.9	7.2	7.4
250	2222.1	10.0	8.6	8.9
Physical Properties at RT—Original cure 5 ft 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
T _b , MPa	12.6	13.2	13.4	13.0
E _b , %	291	319	337	314
Hardness, A, pt	66	67	67	66
Hot Tear Die B at 150 °C (302 °F)—Original cure 7 ft 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, cure 5 hr at 177 °C (351 °F), post-cure at 232 °C (450 °F)				
	<i>16 hr</i>	<i>4 hr</i>	<i>4 hr</i>	<i>4 hr</i>
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, pt	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, pt	70	70	70	70
Pt 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, pt	69	69	70	69
Pt 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

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