

Technical Information

Introduction

Viton™ B-600* fluoroelastomer is a gum polymer that demonstrates improved terpolymer processing and lower compound viscosity, along with the excellent heat and fluid resistance characteristics of the “B-family” of Viton™. Viton™ B-600 is especially suited to curing with the bisphenol system: Viton™ Curative No. 20 and No. 30 or Viton™ Curative No. 50.

Compared with Viton™ B, Viton™ B-600 provides:

- Improved compression molding
 - Increased mold flow
 - Easier mold release
- Improved extrusion and calendering
- Increased cure rate
- Improved compression set resistance

Applications

Viton™ B-600 is highly recommended for applications, such as:

- Molded goods, e.g., shaft seals
- Calendered goods, e.g., flue duct expansion joints

Use of Viton™ B-600

Table 1 contains information comparing compounds of Viton™ B-600 and Viton™ B. Compound A is cured with Viton™ Curative No. 50 (for better de-molding), and Compound B with Viton™ Curative No. 20 and No. 30. VPA No. 3 processing aid is recommended for best de-molding. A study that compares the effect of carbon black level of Viton™ B-600 is shown in Table 2.

Safety and Handling

Before handling or processing Viton™ B-600, please read and be guided by the recommendations as described in the Chemours technical bulletin, “Handling Precautions for Viton™ and Related Chemicals.”

Viton™ B-600 should be handled similar to other types of Viton™. Keep off skin and wash well after handling. For safe handling of other compounding ingredients, please refer to the respective manufacturers’ information.

Product Description

Chemical Composition	Terpolymer of hexafluoropropylene, vinylidene fluoride, and tetrafluoroethylene
Physical Form	Free-flowing pellets
Color	Silver-gray, translucent
Odor	None
Specific Gravity	1.85
Solubility	Low molecular weight esters and ketones
Storage Stability	Excellent
Mooney Viscosity, ML 1+10 at 121 °C (250 °F)	65

*Viton™ B-600 was formerly named VTR-6173.

Table 1. Performance of Viton™ B-600 in Typical Compounds

	Viton™ B-600	Viton™ B-600	Viton™ B
Viton™ B-600	100	100	—
Viton™ B	—	—	100
Viton™ Curative No. 20	—	3.0	3.0
Viton™ Curative No. 30	—	3.8	3.8
Viton™ Curative No. 50	2.5	—	—
MT Black (N990)	30	30	30
High Activity Magnesium Oxide	3	3	3
Calcium Hydroxide	6	6	6
VPA No. 3	1	1	1
Stock Properties			
Mooney Scorch, MS at 121 °C (250 °F)			
Minimum Viscosity, units	64	65	79
Time to 10-unit rise, min	>30	>30	>30
ODR at 177 °C (350 °F), Microdie, 3° arc, 12 min			
M _L , N·m (in·lb)	2.7 (23)	2.9 (25)	4.6 (40)
t _{s2} , min	2.2	1.5	1.6
t'90, min	3.7	3.2	4.2
M _H , N·m (in·lb)	12.9 (111)	10.7 (92)	13.3 (115)
Vulcanizate Properties			
Press Cure: 10 min at 177 °C (350 °F); Post-Cure: 24 hr at 232 °C (450 °F)			
Stress/Strain at 23 °C (73 °F)—Original			
100% Modulus, MPa (psi)	6.3 (910)	5.2 (755)	7.5 (1,085)
Tensile Strength, MPa (psi)	13.0 (1,890)	12.5 (1,810)	14.8 (2,150)
Elongation at Break, %	220	260	215
Hardness, durometer A, points	74	72	76
Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 275 °C (528 °F)			
100% Modulus, MPa (psi)	3.0 (430)	3.0 (435)	4.6 (670)
Tensile Strength, MPa (psi)	8.3 (1,200)	7.6 (1,105)	10.2 (1,485)
Elongation at Break, %	335	370	280
Hardness, durometer A, points	71	70	75
Compression Set, Method B, Plied Discs, %			
22 hr at 200 °C (392 °F)	13	21	26
70 hr at 200 °C (392 °F)	22	28	38
Fluid Resistance, Volume Swell, %			
Fuel C, 70 hr at 23 °C (73 °F)	3.0	2.9	2.6
Methanol, 70 hr at 23 °C (73 °F)	19	19	17
Stauffer 7700 Fluid, 70 hr at 175 °C (347 °F)	9	9	9
Conc. Sulfuric Acid (96%), 70 hr at 150 °C (302 °F)	22	24	28
Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 150 °C (302 °F) in Conc. Sulfuric Acid (96%)			
100% Modulus, MPa (psi)	3.6 (515)	3.5 (505)	3.7 (540)
Tensile Strength, MPa (psi)	7.7 (1,115)	7.4 (1,075)	7.3 (1,065)
Elongation at Break, %	250	265	245
Hardness, durometer A, points	68	65	67

Table 2. The Effect of Carbon Black Level in Viton™ B-600

	5 phr	15 phr	30 phr	45 phr	60 phr
Viton™ B-600	93.4	93.4	93.4	93.4	93.4
MT Black (N990)	5	15	30	45	60
High-Activity Magnesium Oxide	3	3	3	3	3
Calcium Hydroxide	6	6	6	6	6
Viton™ Curative No. 20	3.0	3.0	3.0	3.0	3.0
Viton™ Curative No. 30	3.8	3.8	3.8	3.8	3.8
VPA No. 3	1	1	1	1	1
Stock Properties					
Mooney Scorch, MS at 121 °C (250 °F)					
Minimum Viscosity, units	53	57	72	76	90
Time to 10-unit rise, min	>30	>30	>30	>30	>30
ODR at 177 °C (350 °F), Microdie, 3° arc, 12 min					
M _L , N·m (in·lb)	2.8 (24)	2.8 (24)	3.5 (30)	3.2 (28)	3.7 (32)
t _{s2} , min	1.9	1.9	1.8	1.7	1.5
t _{c90} , min	3.6	3.6	3.9	3.9	3.9
M _H , N·m (in·lb)	9.7 (84)	10.2 (88)	11.1 (96)	11.7 (101)	12.2 (105)
Vulcanizate Properties					
Press Cure: 10 min at 177 °C (350 °F); Post-Cure: 24 hr at 232 °C (450 °F)					
Stress/Strain at 23 °C (73 °F)—Original					
100% Modulus, MPa (psi)	2.2 (315)	3.3 (475)	5.3 (775)	7.2 (1,045)	9.6 (1,385)
Tensile Strength, MPa (psi)	11.1 (1,615)	12.3 (1,785)	12.7 (1,835)	12.1 (1,755)	12.0 (1,735)
Elongation at Break, %	325	290	225	190	140
Hardness, durometer A, points	56	63	71	82	88
Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 275 °C (528 °F)					
100% Modulus, MPa (psi)	1.1 (165)	1.7 (245)	2.9 (420)	4.0 (575)	4.7 (685)
Tensile Strength, MPa (psi)	7.4 (1,070)	7.0 (1,015)	7.1 (1,025)	6.4 (930)	6.1 (890)
Elongation at Break, %	550	440	375	340	285
Hardness, durometer A, points	55	62	71	83	89
Compression Set, Method B, Plied Discs, %					
22 hr at 200 °C (392 °F)	18	20	20	24	36
70 hr at 200 °C (392 °F)	25	28	31	34	45
Fluid Resistance, Volume Swell, %					
Fuel C, 70 hr at 23 °C (73 °F)	3.4	3.0	3.0	2.6	2.3
Methanol, 70 hr at 23 °C (73 °F)	23	21	20	14	11
Stauffer 7700 Fluid, 70 hr at 175 °C (347 °F)	11	10	9	8	7
Conc. Sulfuric Acid (96%), 70 hr at 150 °C (302 °F)	26	24	22	29	35
Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 150 °C (302 °F) in Conc. Sulfuric Acid (96%)					
100% Modulus, MPa (psi)	1.3 (275)	2.5 (365)	3.7 (540)	3.0 (430)	2.0 (285)
Tensile Strength, MPa (psi)	8.8 (1,280)	8.3 (1,200)	8.1 (1,170)	5.5 (800)	6.8 (990)
Elongation at Break, %	320	300	245	325	390
Hardness, durometer A, points	51	57	65	67	59

Test Procedures

Property Measured	Test Procedure
Compression Set	ASTM D395-85, Method B (25% deflection)
Compression Set—Low Temperature	ASTM D1299-87, Method B (25% deflection)
Compression Set, O-Rings	ASTM D1414-78 (87)
Hardness	ASTM D2240-87, durometer A
Mooney Scorch	ASTM D1646-87, using the small rotor. Minimum viscosity and time to a 1-, 5-, and 10-unit rise are reported.
Mooney Viscosity	ASTM D1646-87, 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 D573-88
Stress/Strain Properties 100% Modulus Tensile Strength Elongation at Break	ASTM D412-87, pulled at 8.5 mm/sec (20 in/min)
Stiffness, Torsional, Clash-Berg	ASTM D1043-87
Temperature Retraction	ASTM D1329-88
Volume Change in Fluids	ASTM D471-79

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

For more information, visit Viton.com

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