

## 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 calendaring
- 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.

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

### 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



**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
<b>Stock Properties</b>			
<b>Mooney Scorch, MS at 121 °C (250 °F)</b>			
Minimum Viscosity, units	64	65	79
Time to 10-unit rise, min	>30	>30	>30
<b>ODR at 177 °C (350 °F), Microdie, 3° arc, 12 min</b>			
M <sub>L</sub> , N·m (in·lb)	2.7 (23)	2.9 (25)	4.6 (40)
t <sub>s2</sub> , min	2.2	1.5	1.6
t'90, min	3.7	3.2	4.2
M <sub>H</sub> , N·m (in·lb)	12.9 (111)	10.7 (92)	13.3 (115)
<b>Vulcanizate Properties</b>			
Press Cure: 10 min at 177 °C (350 °F); Post-Cure: 24 hr at 232 °C (450 °F)			
<b>Stress/Strain at 23 °C (73 °F)—Original</b>			
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
<b>Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 275 °C (528 °F)</b>			
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
<b>Compression Set, Method B, Plied Discs, %</b>			
22 hr at 200 °C (392 °F)	13	21	26
70 hr at 200 °C (392 °F)	22	28	38
<b>Fluid Resistance, Volume Swell, %</b>			
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
<b>Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 150 °C (302 °F) in Conc. Sulfuric Acid (96%)</b>			
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
<b>Stock Properties</b>					
<b>Mooney Scorch, MS at 121 °C (250 °F)</b>					
Minimum Viscosity, units	53	57	72	76	90
Time to 10-unit rise, min	>30	>30	>30	>30	>30
<b>ODR at 177 °C (350 °F), Microdie, 3° arc, 12 min</b>					
M <sub>t</sub> , N·m (in·lb)	2.8 (24)	2.8 (24)	3.5 (30)	3.2 (28)	3.7 (32)
t <sub>s2</sub> , min	1.9	1.9	1.8	1.7	1.5
t <sub>c90</sub> , min	3.6	3.6	3.9	3.9	3.9
M <sub>t</sub> , N·m (in·lb)	9.7 (84)	10.2 (88)	11.1 (96)	11.7 (101)	12.2 (105)
<b>Vulcanizate Properties</b>					
Press Cure: 10 min at 177 °C (350 °F); Post-Cure: 24 hr at 232 °C (450 °F)					
<b>Stress/Strain at 23 °C (73 °F)—Original</b>					
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
<b>Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 275 °C (528 °F)</b>					
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
<b>Compression Set, Method B, Plied Discs, %</b>					
22 hr at 200 °C (392 °F)	18	20	20	24	36
70 hr at 200 °C (392 °F)	25	28	31	34	45
<b>Fluid Resistance, Volume Swell, %</b>					
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
<b>Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 150 °C (302 °F) in Conc. Sulfuric Acid (96%)</b>					
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.

