Viton™ Extreme™ ETP-600S

Fluoroelastomers

Technical Information

Introduction

Viton™ Extreme™ ETP-600S* combines the excellent thermal resistance of Viton™ fluoroelastomers with unique resistance to chemicals and environments that have historically exceeded the capabilities of conventional fluoroelastomers. Viton™ Extreme™ ETP-600S provides:

- Excellent resistance to acid, hydrocarbon, and low molecular weight esters, ketones, and aldehydes
- Inherent resistance to base attack and volume changes in highly caustic solutions, amines, and hot water
- Low-temperature flexibility (Tg –10 °C [14 °F])

Compounds based on ETP-600S can be readily processed in the same manner used for mixing, preforming, and molding conventional fluoroelastomers.

Safety and Handling

Before handling or processing Viton™ Extreme™ ETP-600S, 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 ethylene, tetrafluoroethylene, perfluoromethylvinyl ether, and a cure site monomer
Physical Form	Sheet
Appearance	Off-white to tan
Odor	None
Mooney Viscosity, ML 1+10 at 121 °C (250 °F)	Nominal 60
Specific Gravity	1.82
Storage Stability	Excellent
Fluorine, %	~67

*Viton™ Extreme™ ETP-600S was formerly named VTR-8710.

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Table 1. General Properties of Viton™ Extreme™ ETP-600S

	Viton™ Extreme™ ETP-600S
Compound Formulation	
Viton™ Extreme™ ETP-600S	100.0
Zinc Oxide	3.0
Diak™ No. 7	3.0
Luperox® 101XL45	3.0
MT (N990) Carbon Black	30.0
Total	139.0
Mooney Scorch at 121 °C (250 °F)	
ML, Mooney Units	48
T1, min	19.9
T5, min	25.2
T10, min	28.8
T15, min	>30
ODR at 177 °C (351 °F), 3° arc, 12 min clock	
M_L, dNm	25.7
M_H, dNm	108.5
t_s1, min	0.8
t_s2, min	0.9
T'50, min	1.8
T'90, min	4.3
MDR at 177 °C (351 °F), 0.5 arc, 12 min clock	
M_L, dNm	2.7
M_H, dNm	17.7
t_s1, min	0.4
t_s2, min	0.5
T'50, min	0.7
T'90, min	1.8
T'95, min	2.7
Physical Properties at 23 °C (73 °F), Cured 7 min at 177 °C (351 °F); Post-cured 16 hr at 200 °C (392 °F)	
M50, MPa	2.8
M100, MPa	7.9
Tb, MPa	18.3
Eb, %	225
Hardness, Shore A	76
Physical Properties at 23 °C (73 °F), Aged 168 hr at 250 °C (482 °F)	
M50, MPa	2.3
M100, MPa	7.0
Tb, MPa	15.9
Eb, %	265
Hardness, Shore A	75

continued

Table 1. General Properties of Viton™ Extreme™ ETP-600S (continued)

	Viton™ Extreme™ ETP-600S
Change in S/S after 168 hr at 250 °C (482 °F)	
Change in M50, %	–18
Change in M100, %	–11
Change in Tb, %	–13
Change in Eb, %	18
Change in Hd (# pts)	–1
Physical Properties at 23 °C (73 °F), Aged 168 hr at 23 °C (73 °F) in MEK	
M50, MPa	1.3
M100, MPa	4.0
Tb, MPa	10.1
Eb, %	200
Hardness, Shore A	60
Change in S/S after 168 hr at 23 °C (73 °F) in MEK	
Change in M50, %	–54
Change in M100, %	–49
Change in Tb, %	–45
Change in Eb, %	–11
Change in Hd (pts)	–16
Volume Change, %	21
Physical Properties at 23 °C (73 °F), Aged 168 hr in 100 °C (212 °F) in 30% potassium hydroxide in water	
M50, MPa	2.7
M100, MPa	7.2
Tb, MPa	17.2
Eb, %	220
Hardness, Shore A	75
Physical Properties at 23 °C (73 °F), Aged 168 hr in 100 °C (212 °F) in 30% potassium hydroxide in water	
M50, MPa, %	2.7
M100, MPa, %	7.2
Change in Tb, %	–6
Change in Eb, %	–2
Change in Hd, (pts)	–1
Volume Change, %	2
Physical Properties at 23 °C (73 °F), Aged 168 hr in 150 °C (302 °F) in axle lubricant with 6% high pH additive	
M50, MPa	2.2
M100, MPa	6.2
Tb, MPa	15.7
Eb, %	215
Hardness, Shore A	76

continued

Table 1. General Properties of Viton™ Extreme™ ETP-600S (continued)

	Viton™ Extreme™ ETP-600S
Change in S/S after 168 hr at 150 °C (302 °F) in axle lubricant with 6% high pH additive	
Change in M50, %	–22
Change in M100, %	–21
Change in Tb, %	–14
Change in Eb, %	–4
Change in Hd (pts)	0
Volume Change, %	4
Compression Set, Method B (O-Rings)	
Aged 70 hr at 150 °C (302 °F), %	34
Aged 70 hr at 200 °C (392 °F), %	51
Aged 336 hr at 150 °C (302 °F), %	50
Low Temperature Properties	
TR10, °C (°F)	–7 (19)
Tg by MDSC, °C (°F)	–10 (14)

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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