

Technical Information

Introduction

Viton[®] F-605C^{*} fluoroelastomer is a new generation incorporated cure "F-family" terpolymer designed for compression and transfer molding of seals, gaskets, and O-rings that require excellent fluids resistance to today's automotive fuels. In addition to the heat and chemical resistance characteristics typical of Viton[®] fluoroelastomers, Viton[®] F-605C offers significant improvements in processing, rheology, and physical properties.

Compared with Viton[™] F-601C, Viton[™] F-605C provides:

- Improved processing
 - Increased mold flow
 - Improved mold release
 - Less mold fouling
- Improved extrusion performance
- Excellent compression set resistance
- Similar fluids and permeation resistance to automotive fuels (including oxygenated and "sour" fuels)

Applications

Viton" F-605C is recommended for sealing applications, such as fuel systems that require improved fluids and permeation resistance to fuels (especially oxygenated and "sour" fuels). Also for compression/transfer molding of O-rings, gaskets, and diaphragms requiring excellent chemical resistance.

Use of Viton" F-605C

Table 1 compares compounds of Viton[®] F-605C with Viton[®] F-601C, A-401C, and B-601C. Table 2 lists the performance of Viton[®] F-605C relative to Ford Specification M2D401-A8.

Safety and Handling

Before handling or processing Viton" F-605C, read and follow the recommendations in the Chemours technical bulletin, "Handling Precautions for Viton" and Related Chemicals."

Viton" F-605C should be handled like 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 plus cure chemicals
Physical Form	Slab
Color	Off-white
Odor	None
Specific Gravity	1.90
Solubility	Low molecular weight esters and ketones
Storage Stability	Excellent
Mooney Viscosity, ML 1+10 at 121 °C (250 °F)	60

*Viton[™] F-605C was formerly named VTR-7244.



Table 1. Performance of Viton" F-605C in Typical Compounds

	Viton [™] F-605C	Viton [™] F-601C	Viton [™] A-401C	Viton [™] B-601C	
Viton [™] F-605C	100		_	_	
Viton [™] F-601C	_	100	_	_	
Viton [™] A-401C	_		100	_	
Viton [™] B-601C	_		_	100	
High Activity Magnesium Oxide	3	3	3	3	
Calcium Hydroxide	6	6	6	6	
Carnauba Wax	1	1	1	1	
MT Black (N990)	30	30	30	30	
Stock Properties					
Mooney Scorch, MS at 121 °C (250 °F)					
Minimum, in·lb	61	55	69	55	
5 pt rise, min	17.8	>30	>15.7	>30	
10 pt rise, min	24.0	_	>30	_	
ODR at 177 °C (350 °F), Microdie, 3° arc, 12 min					
M _I , in·lb	21	16	16	22	
T _s 2, min	1.5	2.6	2.1	2.7	
T _c .90, min	4.3	6.1	3.7	6.1	
M _c 90, in·lb	93	85	122	106	
M _H , in-Ib	101	93	133	115	
MDR 2000 at 177 °C (350 °F), Microdie, 0.5 arc, 6 min	101	00	100	TTO	
M _I , in·lb	2	2	_	_	
T _s 2, min	1:11	2:04	_	_	
T'50, min	1:54	2:46	_	_	
T'90, min	3:02	3:40	_	_	
M _H , in·lb	28	25	_	_	
Vulcanizate Properties	20	20			
	t 177 °C (350 °F); post-	cured: 24 hr at 232 °C	(450 °F)		
Stress/Strain at 23 °C (73 °F)—Original, Post-Cured					
100% Modulus, MPA (psi)	6.1 (885)	6.9 (995)	7.0 (1010)	6.7 (975)	
Tensile Strength, MPa (% change)	14.9 (2,160)	15.2 (2,200)	13.8 (1,925)	14.0 (2,030)	
Elongation at Break, %	250	255	175	200	
Hardness, Durometer A, pts	77	79	78	76	
Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 250					
100% Modulus, MPA (psi)	5.8 (-5)	7.6 (+10)	6.8 (-2)	5.0 (-25)	
Tensile Strength, MPa (% change)	14.6 (-2)	14.9 (-2)	12.8 (-7)	11.7 (-16)	
Elongation at Break, %	205 (-18)	175 (-31)	172 (-2)	210 (+3)	
Hardness, Durometer A, pts	76	79	78	75	
Stress/Strain at 23 °C (73 °F)—After aging 168 hr at 23 °C (73 °F)/Fuel C-Methanol (85-15)					
100% Modulus, MPA (% change)	4.1 (-33)	4.0 (-42)	_	_	
Tensile Strength, MPa (% change)	10.8 (-28)	9.4 (-38)	—	_	
Elongation at Break, %	280 (+12)	245 (-4)	_	_	
Hardness, Durometer A, pts	67	68	_	_	
Volume Swell, %	9	10	_	_	
Compression Set, Method B, O-Rings, %					
70 hr at 150 °C (302 °F)	14	24	_	_	
22 hr at 200 °C (392 °F)	18	32	14	14	
70 hr at 200 °C (392 °F)	30	47	20	24	
Low Temperature Properties					
DSC (glass transition temperature) Inflection, °C (°F)	-8.1 (17.4)	-7.8 (18.0)	-15.2 (4.6)	-13.2 (8.2)	
	= (=)				

Table 2. Performance of Viton[®] F-605C in Ford Specification M2D401-A8

High Activity Magnesium Oxide33Calcium Hydroxide66Nyad® 40028Ti-Pure" R-9601Akron Chem 414 Green1MT Black (N990)25Vulcanizate PropertiesW2D401-A8 (green)Slabs cured: 10 ft at 177 °C (350 °F); procered: 24 hr at 232 °C /eF)		Viton [™] F-605C	Viton [™] F-605C			
Calcum Hydroxide 6 6 Nyoelf 400 28 Ti-Pure R-960 1 Microal Ad Gooon 1 Mit Back (M980) - 25 Waterinized Properties M20401-A8 (green) Stabs cured: 10 ft at 177 °C (S30 °F) bost-scured 24 hr at 23 °C (743 °F)-Original, Post-Cured 1 Texrise Strongth, Mark (ps) 114 (1.650) 2 8 (1.850) 10.0 min (1.450 min) Aborgation at Areak, % 270 285 175 min Hardness, duronted K, hpts 71 74 75 *5 R10.0 (maximum, °C (PT)) -6 (21) -7 (19) -6 (23) Stress/Strain at 23 °C (73 °F)-After aging 1,000 hr at 200 °C (302 °F) 1 +11 +20 Envines, the toring in the top of (302 °F) 1 +11 +20 Envines, top tot at 23 °C (73 °F)-After aging 336 hr at 60 °C (140 °F)/ASTM Reference Fuel C 1 +11 +20 Envines Strongth, % change (max) -37 -20 -600 Envines Strongth, % change (max) -12 -11 -15 Volume Swell % +12 </td <td>Viton[™] F-605C</td> <td>100</td> <td>100</td> <td></td>	Viton [™] F-605C	100	100			
Nyad [®] 400 28 It-Nue [®] 4600 1 AccorCham 414 Green 1 Micro The Mark (1000) 825 Vicenizate Properties M20401-A8 (green) 5 Statis curred: 10 ft at 177 °C (350 °F); bost-cured: 24 hr at 23 °C (450 °F) 100 min (1.450 min) Dengetion at Drack, % 270 265 175 min Faralle Strength, Me (ass) 711 74 75 ±5 If a Unowinum, °C (°F) -6 (21) -7 (19) -5 (23) Far Strength, Sorting (1984) 71 74 75 ±5 If a Unowinum, °C (°F) -6 (21) -7 (19) -5 (23) Far Strength, Sorting (1984) 71 74 75 ±5 If a Unowinum, °C (°F) -6 (21) -7 (19) -5 (23) Bongstoria Brack, Schenge (max) 0 +11 +20 Hardiness, pit A Schenge (max) -73 -20 -660 Bongstoria Brack, Schenge (max) -73 -20 -660 Bongstoria Brack, Schenge (max) -75 -44	High Activity Magnesium Oxide	3	3			
n-Puner R-960 1 Aktron Chem A14 Green 1 MT Rlack (V890) - 25 Witcamizet Properties Mz0401-A6 (green) Skats curred: 10 ft at 177 °C (350 °F); post-curred: 24 hr at 232 °C (450 °F) Stess/Strain at 23 °C (73 °F)-Original, Post-Curred - MX001 10 0 min (1,450 min) Bernget Strength, MS (ps) 11 4 (1,650) 12 8 (1,850) 100 min (1,450 min) Bernget Strength, MS (ps) 11 4 (1,650) 12 8 (1,850) 10 0 min (1,450 min) Bernget Strength, MS (ps) 11 4 (1,650) 12 8 (1,850) 100 min (1,450 min) Bernget Strength, MS (ps) 11 4 (1,650) 12 8 (1,850) 10 0 min (1,450 min) Berndes Strength, MS (ps) 11 4 (1,650) 17 8 min 17 8 (1,75 min) Berndes Strength, S	Calcium Hydroxide	6	6			
AkranChem 414 Green 1 — MTBack (N990) — 25 MICanack Properties M20401-A8 (green) Stabs cured: 10 ff at 177 °C (S50 °F); post-cured: 24 hr at 23 °C (73 °F)—Original, Post-Cured 1 Starsagistrain at 23 °C (73 °F)—Original, Post-Cured 270 265 175 min Benale Strength, MPa (nsi) 114 (1,650) 12.8 (1,850) 100 min (1,450 min) Engels curonater A, pris 71 74 75 ± 5 Fit 10 (maxinum, °C) °F) -6 (21) -7 (19) -6 (23) Tersale Strength, Qia C 142 168 80 min Stress/Strain at 23 °C (73 °F)—After aging 1,000 hr at 200 °C (392 °F) +11 +20 In and hease, pris change -11 +11 +20 Breade Strength, We change (max) -16 -9 +20 Hardness, pts change -11 +11 +5 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/XSIM Reference Fuel C -40 -40 Hardness, pts change -12 -11 -15 -5 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °	Nyad® 400	28	_			
Millack (M990) – 25 Mideaxie Properties Mideaxie Properties States cured: 10 fit at 177 °C (350 °F) cured: 24 fit at 23 °C (748 °F) – Original, Post-Cured Strength, Me (psn) 114 (1,650) 12 8 (1,850) 100 min (1,450 min) Enails Strength, Me (psn) 114 (1,650) 12 8 (1,850) 100 min (1,450 min) Branchess, duromater A pts 71 74 75-55 TR 10 (maximum, °C (°F)) -6 (21) -7 (19) -6 (23) Bear Strength, We Change (max) 0 +11 #20 Brands Strength, We change (max) -1 +10 #20 Brongstion at Break, We change (max) -1 9 #20 Brands Strength, We change (max) -1 +11 #20 Brongstion at Break, We change (max) -1 +16 -400 Brands Strength, We change (max) -1 +16 -400 Brongstion at Break, We change (max) -1 +16 -400 Brongstion at Break, We change (max) -1 +16 -400 Brongstion at Break, We change (max) -12 +110 +150 <	Ti-Pure™ R-960	1	_			
Witcinizate Properties M2001-AB (green) Stabs cured: 10 ft at 177 °C (350 °F); post-cured: 24 hr at 232 °C (450 °F) Stress/Strain at 23 °C (73 °F)—Original, Post-Cured Tensle Strength, MPa (psi) 11.4 (1,650) 12.8 (1,850) 10.0 min (1,450 min) Bongation at Beak, % 270 265 175 min Hardness, duomator A, pts 71 74 75±5 TR 10 (maximum, °C (°F)) -6 (21) -7 (19) -5 (23) Ters Strength, Bue G 142 168 80 min Stress/Strain at 23 °C (73 °F)—After aging 1.000 hr at 200 °C (392 °F) - - 420 Bongation at Break, % change (max) -16 -9 +20 Bongation at Break, % change (max) -18 -9 +20 Hardness, pts change -1 +11 +20 Bongation at Break, % change (max) -63 -9 +20 Hardness, pts change -1 +11 +5 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/ASTM Reference Fuel C -400 +400 Hardness, pts change -22 -23 -25 +30	AkronChem 414 Green	1	_			
<th c<="" td=""><td>MT Black (N990)</td><td>—</td><td>25</td><td></td></th>	<td>MT Black (N990)</td> <td>—</td> <td>25</td> <td></td>	MT Black (N990)	—	25		
Streas/Strain at 23 °C (73 °F)—Original, Post-Cured 114 (1,650) 12 8 (1,850) 10 0 min (1,450 min) Econgation at Break, %6 270 265 175 min Hardness, durometer A, pts 71 74 75±5 IR 10 (maximum, °C [°F]) -6 (21) -7 (19) -5 (23) Gear Strength, Dio C 142 168 80 min Streas/Strain at 23 °C (73 °F)—After aging 1,000 hr at 200 °C (392 °F) + + 20 Econgation at Break, % change (max) -18 -9 +20 Hardness, pts change (max) -18 -9 +20 Hardness, pts change (max) -18 -9 +20 Econgation at Break, % change (max) -11 +6 -40 Hardness, pts change -12 -11 -15 Volume Swel, % change (max) -11 +6 -40 Hardness, pts change -22 -23 -25 Volume Swel, % change (max) -11 +6 -40 Hardness, pts change -22 -23 -25 Volume Swel, % change (max)	Vulcanizate Properties			M2D401-A8 (green)		
Tensile Strength, MPa (pai) 114 (1,650) 128 (1,850) 10.0 min (1,450 min) Bongation at Break, % 270 265 175 min Hard mess, duronater A, pts 71 74 75-5 TR 10 (maximum, °C (PT) -6 (21) -77 (19) -5 (23) Ear Strength, Wic C 142 168 80 min Stress/Strain at 23 °C (73 °F) — After aging 1,000 hr at 200 °C (392 °F) + + + Iears is Strength, % change (max) -18 -9 + 20 Bongation at Break, % change (max) -18 -9 + 20 Bongation at Break, % change (max) -18 -9 + 20 Bongation at Break, % change (max) -18 -9 + 20 Bongation at Break, % change (max) -11 +11 + 50 Stress/Strain at 23 °C (73 °F) — After aging 336 hr at 60 °C (140 °F)/Oxidized Fuel (PN 180) + 11 +15 Stress/Strain at 23 °C (73 °F) — After aging 2,000 hr at 60 °C (140 °F)/Oxidized Fuel (PN 180) +20 +30 +20 Hardness, th schange (max) -58 <td>Slabs cured: 10 ft at 177 °C</td> <td>(350 °F); post-cured: 24 hr at</td> <td>: 232 °C (450 °F)</td> <td></td>	Slabs cured: 10 ft at 177 °C	(350 °F); post-cured: 24 hr at	: 232 °C (450 °F)			
Elongation at Break, % 270 265 175 min Hardness, duromater A, pts 71 74 75±5 TR 10 (maximum, °C1°F1) -6 (21) -7 (19) -5 (23) Tear Strength, Die C 142 168 80 min Stress/Strain at 23 °C (73 °F)—After aging 1,000 hr at 200 °C (392 °F) - - - - - 20 Bongation at Break, % change (max.) 0 +11 ±20 - - - - - - - 0 +11 ±20 - - - - - 0 +11 ±20 - - - 0 +10 +5 - - 0 - - 0 - - 0 - - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0	Stress/Strain at 23 °C (73 °F)—Original, Post-Cured					
Hardness, duramater A, pts 71 74 75±5 IR 10 (maximum, °C (°F)) -6 (21) -7 (19) -5 (23) Tear Strength, Die C 142 168 80 min Stress/Strain at 23 °C (73 °F)—After aging 1,000 hr at 200 °C (392 °F) - - - Tensile Strength, % change (max) 0 +11 ±20 Elongation at Break, % change (max) -1 +1 ±5 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/ASTI Meference Fuel C - - Tensile Strength, % change (max) -11 +6 -40 Biongation at Break, % change (max) -11 +6 -40 Hardness, pts change -12 -11 -15 Volume Swell, % change (max) -11 +6 -40 Hardness, pts change -22 -21 11 -15 Volume Swell, % change (max) -58 -49 -60 Elongation at Break, % change (max) -58 -49 -25 Volume Swell, % -22 -23 +20 +30 <t< td=""><td>Tensile Strength, MPa (psi)</td><td>11.4 (1,650)</td><td>12.8 (1,850)</td><td>10.0 min (1,450 min)</td></t<>	Tensile Strength, MPa (psi)	11.4 (1,650)	12.8 (1,850)	10.0 min (1,450 min)		
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Tear Strength, Die C 142 168 80 min Stress/Strain at 23 °C (73 °F)—After aging 1,000 hr at 200 °C (392 °F) 1 ±20 Eongation at Break, % change (max.) -18 -9 ±20 Hardness, pts change -1 +11 ±5 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/ASTIM Reference Fuel C 1 +6 -40 Hardness, pts change (max.) -37 -20 -60 1 -11 +10 +15 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/ASTIM Reference Fuel C 11 -11 -15 Volume Swell, % change (max.) -11 +6 -40 -41 -11 -15 Volume Swell, % change (max.) -12 +12 +12 +12 -12 Volume Swell, % change (max.) -58 -49 -60	Hardness, duromater A, pts	71	74	75±5		
Tear Strength, Die C 142 168 80 min Stress/Strain at 23 °C (73 °F)—After aging 1,000 hr at 200 °C (392 °F) 1 ±20 Eongation at Break, % change (max.) -18 -9 ±20 Hardness, pts change -1 +11 ±5 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/ASTIM Reference Fuel C 1 +6 -40 Hardness, pts change (max.) -37 -20 -60 1 -11 +10 +15 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/ASTIM Reference Fuel C 11 -11 -15 Volume Swell, % change (max.) -11 +6 -40 -41 -11 -15 Volume Swell, % change (max.) -12 +12 +12 +12 -12 Volume Swell, % change (max.) -58 -49 -60	TR 10 (maximum, °C [°F])	-6 (21)	-7 (19)	-5 (23)		
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Elongation at Break,% change (max.) -18 -9 ±20 Hardness, pts change -1 ±1 ±5 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/ASTM Reference Fuel C -60 Elongation at Break,% change (max.) -37 -20 -60 Elongation at Break,% change (max.) -11 +6 -40 Hardness, pts change -12 -11 -15 Volume Swell,% ±12 ±12 ±12 Tensile Strength,% change (max.) -58 -49 -60 Elongation at Break,% change (max.) -58 -49 -60 Elongation at Break,% change (max.) -58 -49 -60 Elongation at Break,% change (max.) +35 +49 -25 Hardness, pts change -22 -23 -25 Volume Swell,% ±23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol (50-50) Ensile Strength, % change (max.) - 44 -60 Elongation at Break,% change (max.) - - 15 Volume Swell, % - 15	Stress/Strain at 23 °C (73 °F)—After aging 1,000 hr at 200 °C (3	92 °F)				
Hardness, pts change -1 +10 ±5 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/ASTM Reference Fuel C Iensile Strength, % change (max.) -37 -20 -60 Elongation at Break, % change (max.) -11 +6 -40 Hardness, pts change -12 -11 -15 Volume Swell, % +12 +12 +12 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/0xidzed Fuel (PN 180) Tensile Strength, % change (max.) -58 -49 -60 Elongation at Break, % change (max.) +23 +20 +30 Pardness, pts change -22 -23 -25 Volume Swell, % +23 +20 +30 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol (50-50) Iensile Strength, % change (max.) - -44 -60 Elongation at Break, % change (max.) - +19 +25 Volume Swell, % - -15 -15 -15 Volume Swell, % change (max.) - -44 -60 Elongation at Break, % change (Tensile Strength, % change (max.)	0	+11	±20		
Hardness, pts change -1 +10 ±5 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/ASTM Reference Fuel C Iensile Strength, % change (max.) -37 -20 -60 Elongation at Break, % change (max.) -11 +6 -40 Hardness, pts change -12 -11 -15 Volume Swell, % +12 +12 +12 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/0xidzed Fuel (PN 180) Tensile Strength, % change (max.) -58 -49 -60 Elongation at Break, % change (max.) +23 +20 +30 Pardness, pts change -22 -23 -25 Volume Swell, % +23 +20 +30 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol (50-50) Iensile Strength, % change (max.) - -44 -60 Elongation at Break, % change (max.) - +19 +25 Volume Swell, % - -15 -15 -15 Volume Swell, % change (max.) - -44 -60 Elongation at Break, % change (Elongation at Break,% change (max.)	-18	-9	±20		
Iensile Strength, % change (max.) -37 -20 -60 Elongation at Break, % change (max.) -11 +6 -40 Hardness, pts change -12 -11 -15 Volume Swell, % +12 +12 +12 +15 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/0xidized Fuel (PN 180) - -60 Iensile Strength, % change (max.) -58 -49 -60 Elongation at Break, % change (max.) +35 +49 -25 Hardness, pts change -22 -23 -25 Volume Swell, % +20 +30 -60 Elongation at Break, % change (max.) - -44 -60 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTIM Reference Fuel C-Methanol (50- 50) - -40 Iensile Strength, % change (max.) - -44 -60 Elongation at Break, % change (max.) - -15 -15 Volume Swell, % - -15 -15 -15 Volume Swell, % - -16 -15 -15 Volume Swell, % change (max.) - -54 -70 <td></td> <td>-1</td> <td>+1</td> <td>±5</td>		-1	+1	±5		
Elongation at Break,% change (max.) -11 +6 -40 Hardness, pts change -12 -11 -15 Volume Swell, % +12 +12 +12 Tensile Strength, % change (max.) -58 -49 -60 Elongation at Break,% change (max.) -58 -49 -25 Hardness, pts change -22 -23 -25 Volume Swell, % +23 +20 +30 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol -60 -60 Elongation at Break,% change (max.) - -44 -60 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol -60 -60 Elongation at Break,% change (max.) - -44 -60 Elongation at Break,% change (max.) - -419 -25 Volume Swell, % - -15 -15 Volume Swell, % - -15 -15 Volume Swell, % - -54 -70 Elongation at Break,% change (max.) - -20 -25 Volume Swell, % change (max.)	Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140	°F)/ASTM Reference Fuel C				
Hardness, pts change -12 -11 -15 Volume Swell, % +12 +12 +12 +15 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/0xidized Fuel (PN 180) - - - Tensile Strength, % change (max.) -58 -49 -60 Elongation at Break,% change (max.) +35 +49 -25 Hardness, pts change -22 -23 -25 Volume Swell, % +23 +20 +30 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol (50-50) - - Tensile Strength, % change (max.) - -44 -60 Elongation at Break,% change (max.) - -44 -60 Elongation at Break,% change (max.) - - -15 Yolume Swell, % - - 15 -15 Volume Swell, % - - 19 +25 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol-MTBE (65-20-15) - - Tensile Strength, % change (max.) - - - - - - - <td>Tensile Strength, % change (max.)</td> <td>-37</td> <td>-20</td> <td>-60</td>	Tensile Strength, % change (max.)	-37	-20	-60		
Volume Swell, % +12 +12 +12 +15 Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/0xidized Fuel (PN 180) -58 -49 -60 Elongation at Break, % change (max.) -58 -49 -25 Hardness, pts change -22 -23 -25 Volume Swell, % +23 +20 +30 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol (50-50) - - Tensile Strength, % change (max.) - -44 -60 Elongation at Break, % change (max.) - -44 -60 Elongation at Break, % change (max.) - - -40 Hardness, pts change - - -40 Hardness, pts change - - - Volume Swell, % - - 15 - Volume Swell, % - - - - - Iengation at Break, % change (max.) - - - - - Iengation at Break, % change (max.) - <	Elongation at Break,% change (max.)	-11	+6	-40		
Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140 °F)/0xidized Fuel (PN 180) -49 -60 Iensile Strength, % change (max.) +35 +49 -25 Hardness, pts change -22 -23 -25 Volume Swell, % +23 +20 +30 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol (50-50) - - Tensile Strength, % change (max.) - -44 -60 Elongation at Break,% change (max.) - -15 -40 Hardness, pts change - -15 -15 Volume Swell, % - -15 -15 Volume Swell, % - -16 -70 Iensile Strength, % change (max.) - -54 -70 Iensile Strength, % change (max.) - -20 -25 Iensile Strength, % change (max.) - -20 -25 Hardness, pts chang	Hardness, pts change	-12	-11	-15		
Tensile Strength, % change (max.) -58 -49 -60 Elongation at Break, % change (max.) +35 +49 -25 Hardness, pts change -22 -23 -25 Volume Swell, % +23 +20 +30 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol (50-50) - - Tensile Strength, % change (max.) - -44 -60 Elongation at Break, % change (max.) - -44 -60 Elongation at Break, % change (max.) - -44 -60 Hardness, pts change - -15 -15 Volume Swell, % - -15 -15 Volume Swell, % - -15 -15 Volume Swell, % - -15 -15 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol-MTBE (65-20-15) -70 Iensile Strength, % change (max.) - -54 -70 Iensile Strength, % change (max.) - -20 -25 Volume Swell, % change (max.) - -20 -25 Hardness, pts change	Volume Swell, %	+12	+12	+15		
Elongation at Break,% change (max.) +35 +49 -25 Hardness, pts change -22 -23 -25 Volume Swell, % +23 +20 +30 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol (50-50) - - Tensile Strength, % change (max.) - -44 -60 Elongation at Break,% change (max.) - -15 -40 Hardness, pts change - -15 -15 Volume Swell, % - -15 -15 Volume Swell, % - -15 -15 Volume Swell, % - - -25 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol-MTBE (65-20-15) - Iensile Strength, % change (max.) - -54 -70 Elongation at Break,% change (max.) - +22 -45 Hardness, pts change - -20 -25 Volume Swell, % - +30 +40 Compression Set, Method B, % Plied Discs - +30 +40	Stress/Strain at 23 °C (73 °F)—After aging 336 hr at 60 °C (140	°F)/Oxidized Fuel (PN 180)				
Hardness, pts change -22 -23 -25 Volume Swell, % +23 +20 +30 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol (50-50) - - Tensile Strength, % change (max.) - -44 -60 Elongation at Break, % change (max.) - +22 -40 Hardness, pts change - -15 -15 Volume Swell, % - -15 -15 Volume Swell, % - -10 +25 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol - -15 Volume Swell, % - -15 -15 Itensile Strength, % change (max.) - -54 -70 Itensile Strength, % change (max.) - -20 -25 Itensile Strength, % change (max.) - -20 -25 Itensile Strength, % change (max.) - -20 -25 Volume Swell, % - -30 +40 Volume Swell, % - +30 +40	Tensile Strength, % change (max.)	-58	-49	-60		
Volume Swell, % +23 +20 +30 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol (50-50)	Elongation at Break,% change (max.)	+35	+49	-25		
Stress/Strain at 23 °C (73 °F) — After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol (50-50) Tensile Strength, % change (max.) - -44 -60 Elongation at Break, % change (max.) - +22 -40 Hardness, pts change - -15 -15 Volume Swell, % - +19 +25 Stress/Strain at 23 °C (73 °F) — After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol - -70 Ieongation at Break, % change (max.) - -54 -70 Ieongation at Break, % change (max.) - -54 -70 Ieongation at Break, % change (max.) - -20 -25 Hardness, pts change - -20 -25 Volume Swell, % - +30 +40	Hardness, pts change	-22	-23	-25		
Tensile Strength, % change (max.) - -44 -60 Elongation at Break, % change (max.) - +22 -40 Hardness, pts change - -15 -15 Volume Swell, % - +19 +25 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol-MTBE (65-20-15) - Tensile Strength, % change (max.) - -54 -70 Elongation at Break, % change (max.) - -20 -45 Hardness, pts change - -20 -25 Volume Swell, % - +30 +40	Volume Swell, %	+23	+20	+30		
Elongation at Break,% change (max.) - +22 -40 Hardness, pts change - -15 -15 Volume Swell, % - +19 +25 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol-MTBE (65-20-15) - Tensile Strength, % change (max.) - -54 -70 Elongation at Break,% change (max.) - +22 -45 Hardness, pts change - -20 -25 Volume Swell, % - +30 +40	Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (14	0 °F)/ASTM Reference Fuel C-	Methanol (50-50)			
Hardness, pts change - -15 -15 Volume Swell, % - +19 +25 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol-WTBE (65-20-15) - -70 Tensile Strength, % change (max.) - -54 -70 Elongation at Break,% change (max.) - +2 -45 Hardness, pts change - -20 -25 Volume Swell, % - +30 +40	Tensile Strength, % change (max.)	—	-44	-60		
Volume Swell, % +19 +25 Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol-MTBE (65-20-15) Tensile Strength, % change (max.) -54 -70 Elongation at Break,% change (max.) +2 -45 Hardness, pts change -20 -25 Volume Swell, % +30 +40	Elongation at Break,% change (max.)	—	+22	-40		
Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (140 °F)/ASTM Reference Fuel C-Methanol-MTBE (65-20-15) Tensile Strength, % change (max.) - -54 -70 Elongation at Break,% change (max.) - +2 -45 Hardness, pts change - -20 -25 Volume Swell, % - +30 +40	Hardness, pts change	—	-15	-15		
Tensile Strength, % change (max.) -54 -70 Elongation at Break, % change (max.) +2 -45 Hardness, pts change -20 -25 Volume Swell, % +30 +40 Compression Set, Method B, % Plied Discs	Volume Swell, %	—	+19	+25		
Elongation at Break,% change (max.) +2 -45 Hardness, pts change -20 -25 Volume Swell, % +30 +40 Compression Set, Method B, % Plied Discs	Stress/Strain at 23 °C (73 °F)—After aging 2,000 hr at 60 °C (14	0 °F)/ASTM Reference Fuel C-	Methanol-MTBE (65-20-15	5)		
Hardness, pts change -20 -25 Volume Swell, % +30 +40 Compression Set, Method B, % Plied Discs	Tensile Strength, % change (max.)	—	-54	-70		
Volume Swell, % +30 +40 Compression Set, Method B, % Plied Discs	Elongation at Break,% change (max.)	—	+2	-45		
Compression Set, Method B, % Plied Discs	Hardness, pts change	—	-20	-25		
	Volume Swell, %	—	+30	+40		
	Compression Set, Method B, % Plied Discs					
		25	25	35		

Test Procedures

Property Measured	Test Procedure
Compression Set	ASTM D395-89, Method B (25% deflection)
Compression Set, 0-Rings	ASTM D1414-94
Hardness	ASTM D1229-79 (low temperature) ASTM D2240-91, durometer A
Mooney Scorch	ASTM D1646-95, using small rotor. Minimum viscosity and time to a 1-, 2-, 5- and 10-unit rise are reported.
Mooney Viscosity	ASTM D1646-95, ten pass 121 °C (250 °F)
ODR (vulcanization characteristics measured with an oscillating disk cure meter)	ASTM D2084-93
Property Change After Oven Heat-Aging	ASTM D573-88
Stress/Strain Properties 100% Modulus Tensile Strength Elongation at Break	ASTM D412-92, pulled at 8.5 mm/sec (20 in/min)
Volume Change in Fluids	ASTM D471-95
Temperature Retraction	ASTM D1329-88
Low Temperature Brittleness	ASTM D2137-94
Mooney Viscosity ODR (vulcanization characteristics measured with an oscillating disk cure meter) Property Change After Oven Heat-Aging Stress/Strain Properties 100% Modulus Tensile Strength Elongation at Break Volume Change in Fluids Temperature Retraction	ASTM D1646-95, ten pass 121 °C (250 °F) ASTM D2084-93 ASTM D573-88 ASTM D412-92, pulled at 8.5 mm/sec (20 in/min) ASTM D471-95 ASTM D1329-88

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

For more information, visit Viton.com

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