

## Technical Information

### Introduction

Viton™ AL-300\* is an “AL-family” gum polymer that demonstrates improved processing when compared to its precursor Viton™ B-70N. This gum provides:

- Lower viscosity
- Improved mold flow
- Better mold release
- Less mold fouling
- Improved compression set resistance
- Good low temperature characteristics

### Applications

- Fuel systems, such as fuel injector O-rings
- Injection and transfer molding of O-rings, gaskets, and other sealing devices
- Extruded cords, profiles, and tubing or calendered sheets, when a blend of gum polymers are used
- Solution coatings of fabrics and other substrates

### Product Description

Chemical Composition	Terpolymer of hexafluoropropylene, vinylidene fluoride, and tetrafluoroethylene
Physical Form	Pellet
Color	Off-white
Odor	None
Specific Gravity	1.77
Solubility	Low molecular weight esters and ketones
Storage Stability	Excellent
Mooney Viscosity, ML 1+10 at 121 °C (250 °F)	Nominal 30

### Safety and Handling

Before handling or processing Viton™ AL-300, read and follow the recommendations as described in the Chemours technical bulletin, “Handling Precautions for Viton™ and Related Chemicals.”

Viton™ AL-300 should be handled similar to other types of Viton™. For safe handling of other compounding ingredients, please refer to the respective manufacturers’ information.

\*Viton™ AL-300 was formerly named VTR-744B.



**Table 1. Comparison of Polymer Types to Viton™ AL-300**

	Viton™ AL-300	Viton™ AL-600	Viton™ B-70N	Viton™ A-200
Viton™ AL-300	100	—	—	—
Viton™ AL-600	—	100	—	—
Viton™ B-70N	—	—	100	—
Viton™ A-200	—	—	—	100
Carbon Black (N-990)	30	30	30	30
High-Activity MgO	3	3	3	3
Calcium Hydroxide	6	6	6	6
Viton™ Curative No. 50	2.5	2.5	—	2.5
Viton™ Curative No. 20	—	—	1.8	—
Viton™ Curative No. 30	—	—	3.2	—
<b>Mooney Scorch, MS + 1 at 121 °C (250 °F)</b>				
Minimum Viscosity, units	30	61	46	25
Units Rise at 30 min	0.0	0.0	1.3	0.0
<b>MDR at 177 °C (350 °F), Micro Die, 0.5 Arc, 6 min motor</b>				
Minimum Viscosity, $M_L$ , N·m (in·lb)	0.09 (0.8)	0.28 (2.5)	0.21 (1.9)	0.06 (0.5)
Scorch Time, $t_{s1}$ , min	1.0	0.9	0.9	1.0
Maximum Torque, $M_H$ , N·m (in·lb)	2.02 (17.9)	2.98 (26.4)	1.92 (17.0)	2.32 (20.5)
Optimum Cure Time, $t_c$ , 90, min	2.4	1.9	2.7	2.2
<b>ODR at 177 °C (350 °F), Micro Die, 3 Arc, 12 min motor</b>				
Minimum Torque, $M_L$ , N·m (in·lb)	0.8 (7.0)	2.3 (20.0)	1.7 (15.0)	0.5 (4.5)
Scorch Time, $t_c$ , 2, min	1.8	1.7	1.7	2.0
Maximum Torque, $M_H$ , N·m (in·lb)	9.3 (82.0)	13.3 (118)	8.9 (79)	10.5 (93)
Optimum Cure Time, $t_c$ , 90, min	3.8	3.2	4.1	3.3
<b>Slabs Cured 10 min at 177 °C (350 °F) and Post-Cured 24 hr at 232 °C (450 °F)</b>				
<b>Stress/Strain at 23 °C (73 °F)—Original</b>				
100% Modulus, MPa (psi)	5.1 (735)	6.4 (925)	4.3 (630)	5.3 (775)
Tensile Strength, MPa (psi)	11.6 (1,675)	13.3 (1,925)	11.5 (1,670)	11.3 (1,645)
Elongation at Break, %	215	205	265	220
Hardness, Durometer A	71	70	68	75
<b>Original Die C Tear at 23 °C (73 °F)</b>				
kN/m (pli)	21.5 (123)	21.0 (122)	24.0 (139)	23.0 (131)
<b>Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 200 °C (392 °F)</b>				
100% Modulus, MPa (psi)	5.6 (805)	6.5 (945)	4.5 (650)	5.6 (810)
Tensile Strength, MPa (psi)	11.3 (1,645)	13.8 (2,000)	11.6 (1,685)	12.2 (1,765)
Elongation at Break, %	200	200	255	220
Hardness, Durometer A	72	71	70	76
<b>Stress/Strain at 23 °C (73 °F)—After aging 168 hr at 200 °C (392 °F)</b>				
100% Modulus, MPa (psi)	6.0 (865)	6.9 (1,000)	5.1 (745)	6.1 (890)
Tensile Strength, MPa (psi)	12.9 (1,875)	15.1 (2,190)	13.0 (1,885)	13.6 (1,975)
Elongation at Break, %	205	205	250	230
Hardness, Durometer A	72	72	70	77



**Table 1. Comparison of Polymer Types to Viton™ AL-300 (continued)**

	Viton™ AL-300	Viton™ AL-600	Viton™ B-70N	Viton™ A-200
<b>Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 250 °C (482 °F)</b>				
100% Modulus, MPa (psi)	3.6 (835)	7.0 (1,020)	5.1 (740)	5.8 (840)
Tensile Strength, MPa (psi)	12.3 (1,780)	14.3 (2,075)	11.6 (1,675)	12.1 (1,760)
Elongation at Break, %	210	185	215	200
Hardness, Durometer A	71	72	70	76
<b>Stress/Strain at 23 °C (73 °F)—After aging 168 hr at 250 °C (482 °F)</b>				
100% Modulus, MPa (psi)	5.3 (765)	6.6 (950)	5.0 (730)	5.4 (780)
Tensile Strength, MPa (psi)	11.3 (1,645)	14.2 (2,065)	11.0 (1,600)	12.0 (1,740)
Elongation at Break, %	215	205	210	225
Hardness, Durometer A	71	71	70	76
<b>Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 200 °C (392 °F) in IRM-903 oil</b>				
100% Modulus, MPa (psi)	5.1 (740)	6.4 (930)	4.6 (665)	5.2 (760)
Tensile Strength, MPa (psi)	12.0 (1,735)	13.0 (1,885)	11.1 (1,615)	11.3 (1,640)
Elongation at Break, %	230	200	245	235
Hardness, Durometer A	70	70	68	76
Volume Increase, %	3.5	2.5	2.0	2.0
<b>Stress/Strain at 23 °C (73 °F)—After aging 168 hr at 23 °C (73 °F) in 85% Ref. Fuel C and 15% Methanol</b>				
100% Modulus, MPa (psi)	3.7 (530)	4.6 (670)	2.7 (395)	3.7 (535)
Tensile Strength, MPa (psi)	5.8 (845)	6.7 (970)	5.7 (830)	6.0 (875)
Elongation at Break, %	155	145	210	165
Hardness, Durometer A	51	59	49	57
Volume Increase, %	35.5	30.5	32.0	33.5
<b>Compression Set, Method B, O-Rings, %</b>				
Aged 70 hr at 150 °C (302 °F)	16	8	24	7
Aged 70 hr at 200 °C (392 °F)	25	14	36	18
Aged 168 hr at 200 °C (392 °F)	31	22	44	27
Aged 22 hr at 232 °C (450 °F)	18	11	28	12
<b>Thermal Analysis, DSC (Glass Transition)</b>				
T <sub>g</sub> , °C	-19.5	-19.0	-19.0	-17.0
<b>Temperature Retraction Test</b>				
TR-10, °C	-19.0	-19.0	-18.5	-17.0



**Table 2. Viton™ AL-300—Effect of Carbon Black Levels**

MT Carbon Black (N-990) Levels	65 phr	45 phr	30 phr	15 phr	5 phr
Compound Numbers	A-2	B-2	C-2	D-2	E-2
Viton™ AL-300	100	100	100	100	100
Carbon Black (N-990)	65	45	30	15	5
High-Activity MgO	3	3	3	3	3
Calcium Hydroxide	6	6	6	6	6
Viton™ Curative No. 50	2.5	2.5	2.5	2.5	2.5
<b>Mooney Scorch, MS + 1 at 121 °C (250 °F)</b>					
Minimum Viscosity, units	50.0	39.0	31.0	25.5	22.0
Min to 1 pt Rise	23.0	27.0	28.0	—	—
Units Rise at 30 min	2.2	1.3	1.2	0.0	0.0
<b>MDR at 177 °C (350 °F), Micro Die, 0.5 Arc, 6 min motor</b>					
Minimum Viscosity, $M_L$ , N·m (in·lb)	0.24 (2.1)	0.15 (1.3)	0.10 (0.9)	0.07 (0.6)	0.06 (0.5)
Scorch Time, $t_{s1}$ , min	0.7	0.8	0.9	1.0	1.1
Maximum Torque, $M_H$ , N·m (in·lb)	3.80 (33.6)	2.83 (25.0)	2.09 (18.5)	1.52 (13.5)	1.24 (11.0)
Optimum Cure Time, $t_{c90}$ , min	2.7	2.4	2.2	2.0	2.0
<b>ODR at 177 °C (350 °F), Micro Die, 3 Arc, 12 min motor</b>					
Minimum Torque, $M_L$ , N·m (in·lb)	1.3 (11.5)	1.1 (9.5)	0.9 (8.0)	0.8 (7.0)	0.8 (6.5)
Scorch Time, $t_{s2}$ , min	1.5	1.7	1.9	1.8	2.3
Maximum Torque, $M_H$ , N·m (in·lb)	11.9 (105.0)	10.7 (94.5)	9.8 (87.0)	9.3 (82.0)	8.3 (73.5)
Optimum Cure Time, $t_{c90}$ , min	4.0	3.9	3.8	3.3	3.8
<b>Slabs Cured 10 min at 177 °C (350 °F) and Post-Cured 24 hr at 232 °C (450 °F)</b>					
<b>Stress/Strain at 23 °C (73 °F)—Original</b>					
100% Modulus, MPa (psi)	10.4 (1,510)	8.2 (1,195)	5.7 (825)	3.2 (470)	1.9 (280)
Tensile Strength, MPa (psi)	11.6 (1,680)	12.7 (1,835)	12.5 (1,815)	12.0 (1,745)	9.9 (1,435)
Elongation at Break, %	120	165	215	260	280
Hardness, Durometer A	89	80	72	60	52
<b>Original Die C Tear at 23 °C (73 °F)</b>					
kN/m (pli)	28.7 (164)	23.6 (135)	19.8 (113)	16.3 (93)	13.3 (76)
<b>Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 200 °C (392 °F)</b>					
100% Modulus, MPa (psi)	11.5 (1,660)	8.6 (1,250)	5.8 (835)	3.1 (455)	1.8 (260)
Tensile Strength, MPa (psi)	13.1 (1,895)	13.3 (1,925)	12.4 (1,800)	12.1 (1,760)	10.2 (1,475)
Elongation at Break, %	125	165	205	250	290
Hardness, Durometer A	89	81	74	61	55
<b>Stress/Strain at 23 °C (73 °F)—After aging 168 hr at 200 °C (392 °F)</b>					
100% Modulus, MPa (psi)	9.3 (1,350)	7.1 (1,025)	4.9 (715)	2.8 (405)	1.7 (240)
Tensile Strength, MPa (psi)	10.8 (1,565)	11.0 (1,600)	11.0 (1,590)	10.6 (1,530)	9.5 (1,375)
Elongation at Break, %	130	170	215	260	320
Hardness, Durometer A	90	80	72	62	55



**Table 2. Viton™ AL-300—Effect of Carbon Black Levels (continued)**

MT Carbon Black (N-990) Levels	65 phr	45 phr	30 phr	15 phr	5 phr
Compound Numbers	A-2	B-2	C-2	D-2	E-2
<b>Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 250 °C (482 °F)</b>					
100% Modulus, MPa (psi)	11.0 (1,590)	8.4 (1,215)	5.6 (810)	3.1 (455)	2.0 (285)
Tensile Strength, MPa (psi)	13.1 (1,895)	13.8 (1,995)	13.0 (1,890)	11.6 (1,675)	10.9 (1,585)
Elongation at Break, %	130	180	215	245	295
Hardness, Durometer A	89	79	72	61	55
<b>Stress/Strain at 23 °C (73 °F)—After aging 168 hr at 250 °C (482 °F)</b>					
100% Modulus, MPa (psi)	10.3 (1,490)	8.5 (1,225)	5.6 (815)	3.1 (450)	1.9 (275)
Tensile Strength, MPa (psi)	12.2 (1,775)	12.8 (1,860)	11.9 (1,720)	11.7 (1,700)	9.9 (1,435)
Elongation at Break, %	130	160	210	250	280
Hardness, Durometer A	87	79	72	62	56
<b>Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 200 °C (392 °F) in IRM-903 oil</b>					
100% Modulus, MPa (psi)	10.0 (1,450)	7.3 (1,055)	5.3 (775)	3.2 (465)	2.0 (290)
Tensile Strength, MPa (psi)	11.9 (1,725)	11.7 (1,690)	11.7 (1,700)	10.9 (1,575)	10.9 (1,585)
Elongation at Break, %	130	185	220	235	280
Hardness, Durometer A	88	78	71	60	54
Volume Increase, %	1.7	2.7	2.8	2.8	2.8
<b>Stress/Strain at 23 °C (73 °F)—After aging 168 hr at 23 °C (73 °F) in 85% Ref. Fuel C and 15% Methanol</b>					
100% Modulus, MPa (psi)	6.5 (940)	4.8 (695)	3.4 (495)	2.3 (335)	1.5 (220)
Tensile Strength, MPa (psi)	7.7 (1,115)	6.9 (1,000)	5.6 (810)	4.3 (630)	3.0 (430)
Elongation at Break, %	130	145	160	165	160
Hardness, Durometer A	69	60	53	44	36
Volume Increase, %	27.0	31.0	35.0	38.0	42.0
<b>Compression Set, Method B, O-Rings, %</b>					
Aged 70 hr at 150 °C (302 °F)	18	12	15	10	9
Aged 70 hr at 200 °C (392 °F)	34	14	11	19	18
Aged 168 hr at 200 °C (392 °F)	47	28	31	26	24
Aged 22 hr at 232 °C (450 °F)	39	28	28	22	21
<b>Original Glass Transition (DSC at 20°C/min) on Post-Cured Specimens</b>					
T <sub>g</sub> , °C	-19.0	-19.0	-19.0	-19.0	-19.0
<b>Original Temperature Retraction on Post-Cured Specimens</b>					
TR-10, °C	-21.0	-21.0	-19.0	-19.0	-19.0



**Table 3. Viton™ AL-300—Effect of Mineral Fillers**

Compound Numbers	N-990 30 phr	Albaglos® 30 phr	Nyad® 400 30 phr	Blanc Fixe 30 phr	Blanc Fixe 30 phr	Celite® 350 30 phr	Ti-Pure™ R-960 30 phr
Viton™ AL-300	100	100	100	100	100	100	100
Carbon Black (N-990)	30	—	—	—	—	—	—
Albaglos®	—	30	—	—	—	—	—
Nyad® 400	—	—	30	—	—	—	—
Blanc Fixe	—	—	—	30	60	—	—
Celite® 350	—	—	—	—	—	30	—
Ti-Pure™ R-960	—	—	—	—	—	—	30
High-Activity MgO	3	3	3	3	3	3	3
Calcium Hydroxide	6	6	6	6	6	6	6
Viton™ Curative No. 50	2.5	2.5	2.5	2.5	2.5	2.5	2.5
<b>Mooney Scorch, MS + 1 at 121 °C (250 °F)</b>							
Minimum Viscosity, units	28.5	27.0	25.0	23.0	30.0	37.5	22.0
Units Rise at 30 min	0.0	0.0	0.0	0.0	0.0	1.0	0.0
<b>MDR at 177 °C (350 °F), Micro Die, 0.5 Arc, 6 min motor</b>							
Minimum Viscosity, $M_L$ , N·m (in·lb)	0.09 (0.8)	0.08 (0.7)	0.07 (0.6)	0.06 (0.6)	0.09 (0.8)	0.12 (1.1)	0.06 (0.6)
Scorch Time, $t_{s1}$ , min	1.0	1.0	1.0	1.1	0.9	0.9	1.4
Maximum Torque, $M_H$ , N·m (in·lb)	2.21 (19.6)	2.02 (17.9)	1.88 (16.7)	1.47 (13.1)	2.03 (18.0)	2.61 (23.1)	1.30 (11.5)
Optimum Cure Time, $t_{c90}$ , min	2.1	1.7	1.6	1.8	1.7	1.7	3.5
<b>ODR at 177 °C (350 °F), Micro Die, 3 Arc, 12 min motor</b>							
Minimum Torque, $M_L$ , N·m (in·lb)	0.8 (7.0)	0.8 (7.0)	0.8 (7.0)	0.7 (6.0)	0.8 (7.5)	1.0 (8.5)	0.7 (6.0)
Scorch Time, $t_{s2}$ , min	1.9	2.1	1.8	2.0	1.7	1.6	2.3
Maximum Torque, $M_H$ , N·m (in·lb)	10.1 (89.0)	11.0 (97.0)	10.6 (94.0)	8.9 (78.5)	10.1 (89)	11.5 (101.5)	7.6 (67.5)
Optimum Cure Time, $t_{c90}$ , min	3.4	3.2	2.8	3.2	3.1	2.7	4.9
<b>Slabs Cured 10 min at 177 °C (350 °F) and Post-Cured 24 hr at 232 °C (450 °F)</b>							
<b>Stress/Strain at 23 °C (73 °F), Original</b>							
100% Modulus, MPa (psi)	5.0 (720)	5.8 (835)	8.0 (1165)	2.8 (410)	4.9 (705)	11.4 (1650)	2.9 (425)
Tensile Strength, MPa (psi)	11.1 (1,615)	9.7 (1,400)	10.6 (1540)	9.1 (1,320)	10.8 (1,570)	14.5 (2,105)	12.1 (1,755)
Elongation at Break, %	205	160	165	250	245	140	285
Hardness, Durometer A	68	66	66	60	67	75	63
<b>Original Die C Tear at 23 °C (73 °F)</b>							
kN/m (pli)	22.5 (128)	18.8 (107)	16.8 (96)	17.6 (101)	18.9 (108)	21.2 (121)	21.2 (121)
<b>Stress/Strain at 23 °C (73 °F), After aging 70 hr at 200 °C (392 °F)</b>							
100% Modulus, MPa (psi)	5.7 (830)	6.5 (945)	9.1 (1,320)	3.6 (515)	6.1 (890)	12.7 (1,845)	3.5 (510)
Tensile Strength, MPa (psi)	13.9 (2,020)	11.6 (1,680)	12.1 (1,750)	10.8 (1,560)	11.7 (1,690)	15.7 (2,275)	12.9 (1,870)
Elongation at Break, %	230	150	150	225	190	125	265
Hardness, Durometer A	74	67	67	60	69	78	63



**Table 3. Viton™ AL-300—Effect of Mineral Fillers (continued)**

Compound Numbers	N-990 30 phr	Albaglos® 30 phr	Nyad® 400 30 phr	Blanc Fixe 30 phr	Blanc Fixe 30 phr	Celite® 350 30 phr	Ti-Pure™ R-960 30 phr
<b>Stress/Strain at 23 °C (73 °F)—After aging 168 hr at 200 °C (392 °F)</b>							
100% Modulus, MPa (psi)	5.8 (835)	7.4 (1,070)	8.3 (1,200)	3.4 (490)	6.1 (880)	13.6 (1,970)	3.8 (545)
Tensile Strength, MPa (psi)	14.1 (2,045)	12.8 (1,850)	12.1 (1,750)	10.9 (1,575)	11.7 (1,695)	15.3 (2,220)	13.7 (1,990)
Elongation at Break, %	230	160	180	230	190	120	270
Hardness, Durometer A	75	68	68	60	68	78	66
<b>Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 250 °C (482 °F)</b>							
100% Modulus, MPa (psi)	5.6 (815)	7.6 (1,105)	6.9 (1,005)	3.0 (435)	5.7 (830)	11.6 (1,685)	3.1 (450)
Tensile Strength, MPa (psi)	12.6 (1,830)	10.3 (1,495)	10.7 (1,555)	9.0 (1,300)	10.3 (1,500)	12.7 (1,845)	11.9 (1,730)
Elongation at Break, %	200	125	165	220	175	115	275
Hardness, Durometer A	72	67	67	59	69	75	63
<b>Stress/Strain at 23 °C (73 °F)—After aging 168 hr at 250 °C (482 °F)</b>							
100% Modulus, MPa (psi)	5.4 (785)	7.7 (1,120)	7.7 (1,115)	2.8 (410)	5.2 (755)	8.7 (1,255)	3.6 (515)
Tensile Strength, MPa (psi)	12.2 (1,765)	9.8 (1,425)	10.1 (1,465)	9.8 (1,420)	10.5 (1,515)	10.8 (1,560)	10.7 (1,550)
Elongation at Break, %	210	120	170	250	195	145	245
Hardness, Durometer A	74	70	67	60	68	77	67
<b>Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 200 °C (392 °F) in IRM-903 oil</b>							
100% Modulus, MPa (psi)	5.3 (775)	6.6 (960)	8.2 (1,185)	3.0 (430)	5.3 (770)	12.3 (1,790)	3.3 (485)
Tensile Strength, MPa (psi)	12.0 (1,740)	12.7 (1,835)	11.8 (1,705)	10.9 (1,580)	11.6 (1,685)	15.2 (2,200)	13.4 (1,940)
Elongation at Break, %	225	170	170	250	220	125	275
Hardness, Durometer A	70	65	65	58	67	75	61
Volume Increase, %	2.5	2.0	2.5	2.5	2.5	2.0	2.5
<b>Stress/Strain at 23 °C (73 °F)—After aging 168 hr at 23 °C (73 °F) in 85% Ref. Fuel C and 15% Methanol</b>							
100% Modulus, MPa (psi)	3.6 (525)	3.5 (510)	3.4 (490)	1.8 (255)	2.6 (370)	4.6 (660)	2.1 (300)
Tensile Strength, MPa (psi)	6.1 (880)	4.0 (575)	3.6 (520)	3.2 (460)	4.5 (645)	5.5 (795)	5.4 (780)
Elongation at Break, %	165	115	115	165	185	145	230
Hardness, Durometer A	55	53	53	44	51	60	45
Volume Increase, %	30.5	31.5	34.5	33.0	30.0	29.0	32.0
<b>Compression Set, Method B, O-Rings, %</b>							
Aged 70 hr at 150 °C (302 °F)	15	7	6	7	9	10	18
Aged 70 hr at 200 °C (392 °F)	21	12	18	16	16	16	22
Aged 168 hr at 200 °C (392 °F)	30	26	26	23	22	21	34
Aged 22 hr at 232 °C (450 °F)	11	20	23	20	24	27	28



**Table 4. Viton™ AL-300—Effect of Curative and Acid Acceptor Levels**

Compound Numbers	A-4	B-4	C-4	D-4	E-4	F-4
Viton™ AL-300	97	97.5	98	98.5	97	97
Carbon Black (N-990)	30	30	30	30	30	30
High-Activity MgO	3	3	3	3	6	3
Calcium Hydroxide	6	6	6	6	3	3
Viton™ Curative No. 50	3	2.5	2	1.5	2.5	2.5
<b>Mooney Scorch, MS + 1 at 121 °C (250 °F)</b>						
Minimum Viscosity, units	29.0	28.5	28.5	29.0	28.5	28.0
Units Rise at 30 min	0.0	0.0	0.0	0.0	0.0	0.0
<b>MDR at 177 °C (350 °F), Micro Die, 0.5 Arc, 6 min motor</b>						
Minimum Viscosity, $M_L$ , N·m (in·lb)	0.09 (0.8)	0.09 (0.8)	0.09 (0.8)	0.09 (0.8)	0.08 (0.7)	0.08 (0.7)
Scorch Time, $t_{s1}$ , min	1.1	1.1	1.0	1.0	1.2	1.7
Maximum Torque, $M_H$ , N·m (in·lb)	2.92 (25.9)	2.40 (21.3)	1.75 (15.5)	1.06 (9.4)	2.29 (20.2)	2.29 (20.3)
Optimum Cure Time, $t_c$ , 90, min	2.3	2.3	2.2	2.5	2.9	4.0
<b>ODR at 177 °C (350 °F), Micro Die, 3 Arc, 12 min motor</b>						
Minimum Torque, $M_L$ , N·m (in·lb)	0.7 (6.5)	0.7 (6.5)	0.8 (7.0)	0.8 (7.0)	0.7 (6.0)	0.6 (5.5)
Scorch Time, $t_{s2}$ , min	2.0	1.9	2.0	1.9	2.3	2.8
Maximum Torque, $M_H$ , N·m (in·lb)	12.0 (106.0)	10.2 (90.5)	7.9 (70.0)	4.9 (43.0)	9.9 (87.5)	10.2 (90.5)
Optimum Cure Time, $t_c$ , 90, min	3.5	3.4	3.6	3.9	4.4	5.3
<b>Slabs Cured 10 min at 177 °C (350 °F) and Post-Cured 24 hr at 232 °C (450 °F)</b>						
Stress/Strain at 23 °C (73 °F), Original						
100% Modulus, MPa (psi)	7.0 (1,020)	5.6 (815)	4.3 (630)	2.9 (425)	5.2 (750)	5.0 (725)
Tensile Strength, MPa (psi)	12.8 (1,860)	12.0 (1,735)	11.8 (1,715)	9.6 (1,395)	13.0 (1,890)	12.5 (1,805)
Elongation at Break, %	180	205	260	365	235	220
Hardness, Durometer A	74	72	70	65	70	71
Original Die C Tear at 23 °C (73 °F)						
kN/m (pli)	20.8 (119)	25.0 (143)	23.3 (133)	25.9 (148)	23.5 (134)	21.2 (121)
Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 200 °C (392 °F)						
100% Modulus, MPa (psi)	6.8 (990)	5.8 (835)	4.3 (630)	3.3 (475)	5.1 (740)	5.3 (770)
Tensile Strength, MPa (psi)	11.5 (1,665)	13.6 (1,970)	12.4 (1,795)	10.6 (1,530)	13.3 (1,935)	13.0 (1,885)
Elongation at Break, %	170	225	270	365	240	225
Hardness, Durometer A	77	72	73	69	74	74
Stress/Strain at 23 °C (73 °F)—After aging 168 hr at 200 °C (392 °F)						
100% Modulus, MPa (psi)	7.4 (1,070)	6.5 (945)	5.0 (725)	2.6 (520)	5.8 (845)	5.8 (835)
Tensile Strength, MPa (psi)	14.0 (2,030)	14.1 (2,050)	13.5 (1,950)	11.1 (1,615)	14.1 (2,040)	13.2 (1,910)
Elongation at Break, %	195	210	265	350	225	220
Hardness, Durometer A	76	72	73	71	73	75



**Table 4. Viton™ AL-300—Effect of Curative and Acid Acceptor Levels (continued)**

Compound Numbers	A-4	B-4	C-4	D-4	E-4	F-4
<b>Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 250 °C (482 °F)</b>						
100% Modulus, MPa (psi)	7.1 (1,025)	5.7 (830)	4.3 (620)	2.9 (415)	5.2 (755)	4.8 (700)
Tensile Strength, MPa (psi)	12.7 (1,835)	12.5 (1,805)	11.5 (1,665)	9.5 (1,375)	12.2 (1,765)	11.3 (1,635)
Elongation at Break, %	170	195	245	355	215	220
Hardness, Durometer A	76	73	72	68	74	74
<b>Stress/Strain at 23 °C (73 °F)—After aging 168 hr at 250 °C (482 °F)</b>						
100% Modulus, MPa (psi)	6.8 (990)	5.6 (805)	4.3 (620)	2.8 (410)	4.8 (695)	4.7 (675)
Tensile Strength, MPa (psi)	12.0 (1,735)	11.7 (1,690)	11.3 (1,645)	9.5 (1,380)	11.8 (1,715)	10.7 (1,555)
Elongation at Break, %	165	205	260	365	225	210
Hardness, Durometer A	75	74	72	69	74	74
<b>Stress/Strain at 23 °C (73 °F)—After aging 70 hr at 200 °C (392 °F) in IRM-903 oil</b>						
100% Modulus, MPa (psi)	6.9 (995)	5.6 (815)	4.5 (650)	3.2 (460)	5.2 (755)	5.2 (760)
Tensile Strength, MPa (psi)	12.0 (1,745)	11.8 (1,710)	11.8 (1,710)	10.6 (1,535)	12.1 (1,750)	11.7 (1,695)
Elongation at Break, %	170	200	250	330	220	210
Hardness, Durometer A	71	71	68	66	70	72
Volume Increase, %	2.5	2.5	2.5	2.5	2.5	2.5
<b>Stress/Strain at 23 °C (73 °F)—After aging 168 hr at 23 °C (73 °F) in 85% Ref. Fuel C and 15% Methanol</b>						
100% Modulus, MPa (psi)	4.9 (715)	3.9 (560)	3.1 (455)	1.8 (265)	3.6 (520)	3.5 (510)
Tensile Strength, MPa (psi)	5.1 (740)	5.8 (840)	5.8 (835)	4.8 (695)	5.6 (815)	4.9 (710)
Elongation at Break, %	105	150	180	255	155	130
Hardness, Durometer A	59	54	47	37	52	52
Volume Increase, %	38.5	39.0	39.5	43.5	38.0	40.0
<b>Compression Set, Method B, O-Rings, %</b>						
Aged 70 hr at 150 °C (302 °F)	8	15	17	42	9	7
Aged 70 hr at 200 °C (392 °F)	18	23	21	44	16	19
Aged 168 hr at 200 °C (392 °F)	27	30	34	54	31	29
Aged 22 hr at 232 °C (392 °F)	19	20	26	47	22	19
<b>Original Glass Transition (DSC at 20 °C [68 °F]/min) on Post-Cured Specimens</b>						
T <sub>g</sub> , °C	-19.0	-19.0	-20.0	-19.5	-19.5	-19.5
<b>Original Temperature Retraction on Post-Cured Specimens</b>						
TR-10, °C	-19.0	-19.0	-19.5	-19.0	-19.0	-19.0



## Test Procedures

Property Measured	Test Procedure
Compression Set	ASTM D395-89, Method B (25% deflection)
Compression Set, O-Rings	ASTM D1414-94
Hardness	ASTM D2240-91, durometer A
Mooney Scorch	ASTM D1646-95, using the 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	ASTM D412-92, dumbbell specimens tested at 50 m/min (20 in/min)
Volume Change in Fluids	ASTM D471-95
Temperature Retraction	ASTM D1329-88

Test temperature is 23 °C (73 °F) except where specified otherwise.

