Viton™ Curatives No. 20, No. 30, and No. 50

Fluoroelastomers

Technical Information

Introduction

Viton Curatives No. 20, No. 30, and No. 50 are accelerator and cross-linkers for bisphenol AF-based curing of fluoroelastomers. Curatives No. 20, No. 30, and No. 50 can be used to accelerate and cure all Viton™ FKM types that contain VF2 and HFP monomers. Types that cannot be effectively cured include the PMVE monomer containing low-temperature grades (GLT-S, GFLT-S) and FEPM-type Viton™ ETP-600S.

Safety and Handling

Before handling or processing Viton™ Curative No. 20, No. 30, and No. 50, refer to the Chemours technical bulletin, "Handling Precautions for Viton™ and Related Chemicals." Curatives may cause irritation to skin and eyes and be harmful if inhaled. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation.

Curatives No. 20 and No. 30

Curatives No. 20 and No.30 are separate accelerator and cross-linker masterbatches, allowing for easy and independent adjustment of cure state and cure rate. Both curatives are dispersed in a binder of a fluoroelastomer dipolymer "A-type."

Curative No. 30 contains the bisphenol AF cross-linker. Curative No. 20 contains a phosphonium-based accelerator. The level of Curative No. 30 in the formulation will determine the state-of-cure, while the ratio of No. 20 to No. 30 will dictate the speed of curing.

The typical usage level for Curative No. 30 is 2.5 to 4.5 phr, depending on the desired cure state. When accelerating and curing A-type dipolymers, the recommended ratio of No. 20 to No. 30 should be approximately 1:2. B-type copolymers require greater acceleration, and a ratio of 3:4 is recommended.

Curative No. 20—Product Description

Chemical Composition	33% organophosphonium salt and 67% fluoroelastomer dipolymer binder
Physical Form	Free-flowing pellets
Color	White to off-white
Specific Gravity	1.50

Curative No. 30—Product Description

Chemical Composition	50% bisphenol AF and 50% fluoroelastomer dipolymer binder
Physical Form	Free-flowing pellets
Color	Tan to gray-brown
Specific Gravity	1.64

Processing Curatives No. 20 and No. 30

The masterbatch form of these curatives allows for easy dispersion using two roll mills and internal mixers. When mill mixing, No. 20 and No. 30 should be added to the banded polymer as early in the mixing operation as possible. Neither of the chemicals will melt under normal mixing conditions and, thus, depend on good shear for dispersion. Adding these chemical masterbatches late in the mix will result in dispersion problems.

In the case of internal mixing of Viton™, it is suggested that the curative masterbatches be charged to the mixer along with the polymer. In some formulations where scorch is a problem, it may be necessary to withhold the curative masterbatches from the internal mixer. The masterbatches can then be added in a second pass through the internal mixer or on a mill. For additional mixing and processing strategies, consult the Chemours technical bulletin, "Viton™ Processing Guide."

Chemours™

Curative No. 50

Curative No. 50 is a 100% active, combined curative and accelerator, optimized for fast curing and reduced mold fouling of Viton™ fluoroelastomers. Typical usage level in a formulation is 1.7 to 2.6 phr. Relative to the standard bisphenol curing system of Viton™ Curative No. 20 (accelerator) and Viton™ Curative No. 30 (cross-linking agent), Viton™ Curative No. 50 provides:

- Reduced mold fouling
- Incorporated accelerator and cross-linking agent
- Faster cure without significant loss in scorch safety
- Somewhat decreased metal adhesion

Viton™ Curative No. 50 is recommended for use in most applications where a bisphenol cure is used, including O-rings, seals, molded shapes, diaphragms, and tubing. When combined with appropriate process aids, it is especially suited for injection and compression molding with automatic part removal.

Curative No. 50—Product Description

Physical Form	Free-flowing
Color	Tan to pink
Odor	Negligible
Specific Gravity	1.38
Melting Point, °C (°F)	60–100 (140–212)
Solubility	Soluble in low molecular weight polar solvents and low molecular weight esters

Processing Curative No. 50

No. 50 is supplied in the form of free-flowing pastilles that will readily break up into smaller particles during incorporation. However, the No. 50 must melt in order to be properly dispersed. No. 50 has a broad melting point, beginning at approximately 60-80 °C (140-176 °F) and ending at approximately 100 °C (212 °F). Therefore, the batch should reach a temperature of 100 °C (212 °F) to ensure melting. Melting and dispersion of No. 50 is generally easier to accomplish when using an internal mixer; though, good results can be obtained using roll mills.

For additional mixing and processing strategies, consult the Chemours technical bulletin, "Viton™ Processing Guide."

Usage Strategies for Viton™ Curatives

The bisphenol cure rate can be adjusted as shown below:

Increase Cure Rate:

- Increase Viton™ Curative No. 20
- Decrease Viton™ Curative No. 30
- Increase calcium hydroxide

Decrease Cure Rate:

- Decrease Viton™ Curative No. 20
- Increase Viton™ Curative No. 30
- Decrease calcium hydroxide

The state of the cure can be changed by increasing or decreasing Viton™ Curative No. 50 or No. 30. Higher cure states generally result in lower compression set values, reduced elongation, and higher modulus. Example formulations showing the effect of increasing Curative No. 50 in Viton™ B-600 can be found in Table 4.

Curative No. 20 can also be used to further accelerate the cure rate of curative-containing precompounds. Alternatively, No. 20 can be added in combination with No. 50 to gums to impart faster cure speeds than No. 50 alone, in particular, higher fluorine copolymer "B-type" fluoroelastomer gums.

Viton™ A-500 and Viton™ E-60 example formulations with Curative No. 50 and various levels and ratios of Curative No. 20 and Curative No. 30 are shown in Tables 1 and 2. Examples of Viton™ Curatives in formulations of Viton™ E-45 and Viton™ A-HV are shown in Table 3.

Table 1. Properties of Viton™ A-500 Compounds Using Viton™ Curatives

Compound #:	CSG0244-02	CSG0244-03	CSG0245-01	CSG0245-02	CSG0245-03	CSG0245-04
VC20/VC30 ratio:	—	0.45	0.35	0.55	0.56	0.38
Viton™ A-401C						
Viton™ A-500	97.5	94.2	94.6	93.8	95	93.4
N990	30	30	30	30	30	30
Calcium Hydroxide HP-XL	6	6	6	6	6	6
Elastomag 170	3	3	3	3	3	3
Curative No. 50	2.5					
Curative No. 30		4.0	4.0	4.0	3.2	4.8
Curative No. 20		1.8	1.4	2.2	1.8	1.8
Total phr	139	139	139	139	139	139
Compound Mooney Viscosity, ML 1+10, 121 °C (250 °F)						
Initial (MU)	161	169	165	163	165	167
ML (1+10) (MU)	93	94	94	90	89	96
Mooney Scorch, Small Rotor, 121 °C (250 °F), 30 min test						
ML (MU)	52	52	50	49	48	51
T2 (min)	25.4	>30	>30	23.6	19.8	>30
T5 (min)	>30	>30	>30	28.0	23.5	>30
MDR at 177 °C (351 °F), 10 min, 0.5°Arc						
ML (dNm)	1.83	1.89	1.86	1.96	2.01	1.84
MH (dNm)	29.6	27.6	27.1	26.4	21.0	32.6
ts2 (min)	1.0	0.9	1.1	0.7	0.7	1.2
T'50 (min)	1.2	1.3	1.6	1.0	0.9	1.7
T'90 (min)	1.9	1.9	2.3	1.5	1.4	2.5
T'95 (min)	2.3	2.3	2.8	1.8	1.7	3.0
Vulcanizate Properties						
Press cure 10 min at 177 °C (351 F), Oven post-cure 24 hr at 232 °C (450 °F)						
Original Properties at 23 °C (73 °F)—No Post-Cure						
Hardness (Shore A)	74	74	73	73	72	76
10% Modulus (MPa)	1.05	0.99	1.00	1.08	0.91	1.19
25% Modulus (MPa)	1.84	1.71	1.74	1.89	1.59	1.98
50% Modulus (MPa)	2.82	2.67	2.74	2.84	2.32	3.21
100% Modulus (MPa)	4.91	4.84	4.89	5.05	4.02	5.78
Tensile at Break (MPa)	9.53	10.9	10.9	10.8	10.7	10.6
Elongation at Break (%)	208	252	247	273	309	207
Die B Tear (kN/m)	39.1	42.4	40.0	42.9	44.3	40.8
Die C Tear (kN/m)	19.4	19.9	19.4	19.9	21.3	19.0
Original Properties at 23 °C (73 °F)—Post-Cured						
Hardness (Shore A)	76	76	74	76	74	79
10% Modulus (MPa)	1.14	1.02	1.01	1.23	0.97	1.34
25% Modulus (MPa)	2.07	1.95	1.86	2.10	1.78	2.36
50% Modulus (MPa)	3.34	3.30	3.07	3.50	2.78	4.07

continued

Table 1. Properties of Viton™ A-500 Compounds Using Viton™ Curatives (continued)

Compound #:	CSG0244-02	CSG0244-03	CSG0245-01	CSG0245-02	CSG0245-03	CSG0245-04
VC20/VC30 ratio:	—	0.45	0.35	0.55	0.56	0.38
100% Modulus (MPa)	7.04	7.00	7.07	7.26	5.66	8.64
Tensile at Break (MPa)	15.9	15.2	15.6	15.7	15.5	14.8
Elongation at Break (%)	201	195	190	198	241	165
Die B Tear (kN/m)	47.0	47.6	44.4	49.5	50.4	44.4
Die C Tear (kN/m)	20.8	20.4	20.1	21.1	21.5	19.6
Hot Air Aged 72 hr at 275 °C (527 °F)						
Hardness (Shore A)	77	77	76	77	75	79
Hardness (Pt. Change)	1	1	2	1	1	0
100% Modulus (MPa)	4.29	4.63	4.77	4.97	3.61	6.28
100% Modulus (% Change)	–39%	–34%	–33%	–32%	–36%	–27%
Tensile at Break (MPa)	11.1	10.4	10.6	10.7	9.46	11.2
Tensile at Break (% Change)	–30%	–31%	–32%	–32%	–39%	–25%
Elongation at Break (%)	247	244	228	240	306	192
Elongation at Break (% Change)	23%	25%	20%	21%	27%	16%
Hot Air Aged 168 hr at 275 °C (527 °F)						
Hardness (Shore A)	81	82	79	82	77	85
Hardness (Pt. Change)	5	6	6	6	3	6
100% Modulus (MPa)	4.52	4.55	4.89	4.98	3.37	6.56
100% Modulus (% Change)	–36%	–35%	–31%	–31%	–41%	–24%
Tensile at Break (MPa)	7.39	7.26	8.07	7.64	6.60	8.41
Tensile at Break (% Change)	–54%	–52%	–48%	–51%	–57%	–43%
Elongation at Break (%)	189	200	193	189	269	143
Elongation at Break (% Change)	–6%	3%	1%	–5%	12%	–13%
Hot Air Aged 504 hr at 250 °C (482 °F)						
Hardness (Shore A)	81	83	80	84	80	86
Hardness (Pt. Change)	6	7	7	8	6	7
100% Modulus (MPa)	5.10	5.54	5.73	5.96	4.28	7.39
100% Modulus (% Change)	–28%	–21%	–19%	–18%	–24%	–15%
Tensile at Break (MPa)	9.47	9.65	9.45	8.96	8.39	9.64
Tensile at Break (% Change)	–41%	–36%	–39%	–43%	–46%	–35%
Elongation at Break (%)	197	211	184	178	256	145
Elongation at Break (% Change)	–2%	8%	–3%	–11%	7%	–12%
Compression Set, Pellet, Method B, No Post-Cure						
70 hr at 150 °C (302 °F) (%)	51	57	59	62	63	61
70 hr at 200 °C (392 °F) (%)	67	73	72	77	76	78
Compression Set, Pellet, Method B, Post-Cured						
70 hr at 200 °C (392 °F) (%)	16	17	17	19	21	17
70 hr at 230 °C (446 °F) (%)	35	36	33	39	40	33

Table 2. Properties of Viton™ E-60 Compounds Using Viton™ Curatives

Compound #:	CSG0244-08	CSG0244-09	CSG0245-05	CSG0245-06	CSG0245-07	CSG0245-08
VC20/VC30 ratio:	—	0.45	0.35	0.55	0.56	0.38
Viton™ E-60	97.5	94.2	94.6	93.8	95	93.4
N990	30	30	30	30	30	30
Calcium Hydroxide HP-XL	6	6	6	6	6	6
Elastomag 170	3	3	3	3	3	3
Curative No. 50	2.5					
Curative No. 30		4.0	4.0	4.0	3.2	4.8
Curative No. 20		1.8	1.4	2.2	1.8	1.8
Total phr	139	139	139	139	139	139
Compound Mooney Viscosity, ML 1+10, 121 °C (250 °F)						
Initial (MU)	158	156	151	149	148	159
ML (1+10) (MU)	81	84	82	85	82	84
Mooney Scorch, Small Rotor, 121 °C (250 °F), 30 min test						
Initial (MU)	88	86	88	81	80	85
T2 (min)	>30	>30	>30	12.7	14.7	>30
T5 (min)	>30	>30	>30	16.7	19.3	>30
MDR at 177 °C (351 °F), 10 min, 0.5°Arc						
ML (dNm)	1.58	1.70	1.64	1.82	1.78	1.60
MH (dNm)	30.5	28.5	28.1	27.0	22.1	33.9
ts2 (min)	1.0	1.0	1.2	0.7	0.7	1.2
T'50 (min)	1.3	1.3	1.7	1.0	1.0	1.8
T'90 (min)	2.0	2.1	2.7	1.6	1.8	2.7
T'95 (min)	2.4	2.7	3.3	2.1	2.5	3.2
Vulcanizate Properties						
Press cured 10 min at 177 °C (351 °F), Oven post-cured 24 hr at 232 °C (450 °F)						
Original Properties at 23 °C (73 °F)—No Post-Cure						
Hardness (Shore A)	74	74	73	73	72	76
10% Modulus (MPa)	1.13	1.04	0.92	1.03	0.88	1.16
25% Modulus (MPa)	1.85	1.78	1.66	1.75	1.60	1.99
50% Modulus (MPa)	2.79	2.74	2.65	2.77	2.44	3.16
100% Modulus (MPa)	4.96	5.08	4.92	5.02	4.22	5.76
Tensile at Break (MPa)	10.1	10.7	10.9	10.4	10.5	10.1
Elongation at Break (%)	230	250	250	244	286	194
Die B Tear (kN/m)	40.3	41.3	42.6	43.9	44.8	39.5
Die C Tear (kN/m)	19.3	19.5	19.3	20.1	21.7	18.6
Original Properties at 23 °C (73 °F)—Post-Cured						
Hardness (Shore A)	76	76	75	76	74	78
10% Modulus (MPa)	1.24	1.12	0.97	1.14	0.97	1.34
25% Modulus (MPa)	2.17	2.09	1.91	2.06	1.74	2.33
50% Modulus (MPa)	3.53	3.53	3.31	3.56	2.87	4.24
100% Modulus (MPa)	7.28	7.62	7.38	7.55	5.85	9.10

continued

Table 2. Properties of Viton™ E-60 Compounds Using Viton™ Curatives (continued)

Compound #:	CSG0244-08	CSG0244-09	CSG0245-05	CSG0245-06	CSG0245-07	CSG0245-08
VC20/VC30 ratio:	—	0.45	0.35	0.55	0.56	0.38
Tensile at Break (MPa)	15.7	14.4	16.2	15.4	15.2	14.8
Elongation at Break (%)	200	175	197	192	228	157
Die B Tear (kN/m)	45.7	44.8	46.8	47.0	50.5	45.6
Die C Tear (kN/m)	20.3	19.9	19.5	20.7	21.7	19.6
Hot Air Aged 72 hr at 275 °C (527 °F)						
Hardness (Shore A)	79	78	77	78	76	80
Hardness (Pt. Change)	3	2	2	2	2	2
100% Modulus (MPa)	4.77	5.36	4.95	5.70	4.22	6.67
100% Modulus (% Change)	–35%	–30%	–33%	–25%	–28%	–27%
Tensile at Break (MPa)	11.4	11.6	11.2	11.3	9.9	11.9
Tensile at Break (% Change)	–28%	–20%	–31%	–27%	–35%	–20%
Elongation at Break (%)	227	223	213	219	273	182
Elongation at Break (% Change)	13%	27%	8%	14%	20%	16%
Hot Air Aged 168 hr at 275 °C (527 °F)						
Hardness (Shore A)	82	83	81	83	79	86
Hardness (Pt. Change)	6	6	6	7	5	8
100% Modulus (MPa)	4.93	5.62	5.69	5.81	4.24	7.90
100% Modulus (% Change)	–32%	–26%	–23%	–23%	–28%	–13%
Tensile at Break (MPa)	8.14	8.51	8.84	8.41	7.54	8.83
Tensile at Break (% Change)	–48%	–41%	–45%	–46%	–50%	–41%
Elongation at Break (%)	178	177	173	174	261	120
Elongation at Break (% Change)	–11%	1%	–12%	–10%	14%	–24%
Hot Air Aged 504 hr at 250 °C (482 °F)						
Hardness (Shore A)	83	84	83	85	81	86
Hardness (Pt. Change)	6	8	8	10	7	8
100% Modulus (MPa)	5.67	6.31	6.30	6.56	4.94	8.22
100% Modulus (% Change)	–22%	–17%	–15%	–13%	–16%	–10%
Tensile at Break (MPa)	10.6	10.4	10.5	10.1	9.7	11.2
Tensile at Break (% Change)	–33%	–28%	–35%	–34%	–36%	–25%
Elongation at Break (%)	201	188	178	176	234	145
Elongation at Break (% Change)	0%	7%	–10%	–9%	3%	–7%
Compression Set, Pellet, Method B, No Post-Cure						
70 hr at 150 °C (302 °F) (%)	55	60	61	64	64	61
70 hr at 200 °C (392 °F) (%)	72	78	75	79	78	81
Compression Set, Pellet, Method B, Post-Cured						
70 hr at 200 °C (392 °F) (%)	17	18	18	22	21	18
70 hr at 230 °C (446 °F) (%)	37	37	36	38	41	35

Table 3. Properties of Viton™ E-45 and A-HV Compounds Using Viton™ Curatives

Compound #:	CSG0244-06	CSG0244-07	CSG0244-10	CSG0244-11
Viton™ E-45	97.5	94.2		
Viton™ A-HV			97.5	94.2
N990	30	30	30	30
Calcium Hydroxide HP-XL	6	6	6	6
Elastomag 170	3	3	3	3
Curative No. 50	2.5		2.5	
Curative No. 30		4		4
Curative No. 20		1.8		1.8
Total phr	139	139	139	139
Compound Mooney Viscosity, ML 1+10, 121 °C (250 °F)				
Initial (MU)	124	131	221	217
ML (1+10) (MU)	64	65	182	182
Mooney Scorch, Small Rotor, 121 °C (250 °F), 30 min test				
ML (MU)	34	36	99	98
T2 (min)	>30	>30	1.2	0.4
T5 (min)	>30	>30	>30	1.2
MDR at 177 °C (351 °F), 10 min, 0.5°Arc				
ML (dNm)	1.13	1.23	5.29	5.29
MH (dNm)	28.7	26.0	34.7	34.2
ts2 (min)	1.1	1.0	1.0	0.9
T'50 (min)	1.5	1.4	1.5	1.5
T'90 (min)	2.3	2.3	2.1	2.1
T'95 (min)	2.9	2.8	2.5	2.5
Vulcanizate Properties				
Press cured 10 min at 177 °C (351 °F), Oven post-cured 24 hr at 232 °C (450 °F)				
Original Properties at 23 °C (73 °F)—No Post-Cure				
Hardness (Shore A)	74	74	73	74
10% Modulus (MPa)	1.15	1.01	1.06	1.04
25% Modulus (MPa)	1.88	1.78	1.82	1.87
50% Modulus (MPa)	2.77	2.79	3.03	3.19
100% Modulus (MPa)	4.73	5.01	6.06	6.14
Tensile at Break (MPa)	9.47	10.6	12.3	12.2
Elongation at Break (%)	234	251	216	208
Die B Tear (kN/m)	41.8	40.4	40.5	42.1
Die C Tear (kN/m)	19.8	19.9	18.3	19.2
Original Properties at 23 °C (73 °F)—Post-Cured				
Hardness (Shore A)	79	77	77	76
10% Modulus (MPa)	1.34	1.14	1.11	1.12
25% Modulus (MPa)	2.19	2.01	2.02	2.08
50% Modulus (MPa)	3.43	3.35	3.52	3.72
100% Modulus (MPa)	6.86	7.06	8.05	8.44

continued

Table 3. Properties of Viton™ E-45 and A-HV Compounds Using Viton™ Curatives (continued)

Compound #:	CSG0244-06	CSG0244-07	CSG0244-10	CSG0244-11
Tensile at Break (MPa)	11.1	14.1	16.6	16.1
Elongation at Break (%)	152	183	187	175
Die B Tear (kN/m)	47.4	47.8	46.4	46.3
Die C Tear (kN/m)	20.8	20.4	19.7	20.0
Hot Air Aged 72 hr at 275 °C (527 °F)				
Hardness (Shore A)	80	79	74	76
Hardness (Pt. Change)	1	2	–2	0
100% Modulus (MPa)	4.41	5.12	5.46	5.69
100% Modulus (% Change)	–36%	–28%	–32%	–33%
Tensile at Break (MPa)	10.7	10.5	12.2	11.8
Tensile at Break (% Change)	–4%	–26%	–26%	–27%
Elongation at Break (%)	243	229	211	216
Elongation at Break (% Change)	60%	25%	13%	23%
Hot Air Aged 168 hr at 275 °C (527 °F)				
Hardness (Shore A)	84	84	78	80
Hardness (Pt. Change)	5	7	2	4
100% Modulus (MPa)	4.76	5.29	4.53	5.30
100% Modulus (% Change)	–31%	–25%	–44%	–37%
Tensile at Break (MPa)	7.76	7.80	8.79	8.15
Tensile at Break (% Change)	–30%	–45%	–47%	–49%
Elongation at Break (%)	192	178	216	189
Elongation at Break (% Change)	27%	–2%	16%	8%
Hot Air Aged 504 hr at 250 °C (482 F)				
Hardness (Shore A)	84	84	79	80
Hardness (Pt. Change)	6	7	2	5
100% Modulus (MPa)	5.24	5.95	5.92	6.46
100% Modulus (% Change)	–24%	–16%	–27%	–24%
Tensile at Break (MPa)	9.93	9.86	11.1	10.6
Tensile at Break (% Change)	–11%	–30%	–33%	–34%
Elongation at Break (%)	209	198	198	190
Elongation at Break (% Change)	37%	9%	6%	9%
Compression Set, Pellet, Method B, No Post-Cure				
70 hr at 150 °C (302 °F) (%)	56	65	46	53
70 hr at 200 °C (392 °F) (%)	72	80	64	71
Compression Set, Pellet, Method B, Post-Cured				
70 hr at 200 °C (392 °F) (%)	18	19	16	16
70 hr at 230 °C (446 °F) (%)	40	40	32	34

Table 4. Properties of Viton™ B-600 Using Viton™ Curative No. 50

Compound #:	TMD0085-01	TMD0085-02	TMD0085-03	TMD0085-04	TMD0085-05	TMD0085-06
VC #50 Level:	1.25	1.5	1.75	2	2.25	2.5
Viton™ B-600	100	100	100	100	100	100
N990	10	10	10	10	10	10
Calcium Hydroxide HP-XL	6	6	6	6	6	6
Elastomag 170	3	3	3	3	3	3
Curative No. 50	1.25	1.50	1.75	2.00	2.25	2.50
Carnauba Wax	1	1	1	1	1	1
Total phr	121.25	121.5	121.75	122.00	122.25	122.5
Mooney Viscosity at 121 °C (250 °F)						
ML (1+10) (MU)	88	91	92	93	92	92
Mooney Scorch at 121 C (250 °F)						
ML (MU)	47.9	48.7	48.6	48.7	48.9	49.3
T1 (min)	21.4	18.4	23.0	18.5	13.9	19.3
T2 (min)	>30	>30	>30	>30	>30	>30
MDR2000 at 177 °C (351 °F), 0.5 Arc, 12 min Clock						
ML (dNm)	1.53	1.52	1.52	1.53	1.53	1.54
MH (dNm)	10.0	11.7	13.5	14.9	16.6	18.2
ts1 (min)	1.5	1.7	2.0	2.3	2.6	3.0
ts2 (min)	1.8	1.9	2.2	2.5	2.9	3.4
T'50 (min)	2.2	2.3	2.6	3.0	3.4	3.9
T'90 (min)	3.7	3.5	3.8	4.3	4.8	5.4
T'95 (min)	4.7	4.3	4.6	5.0	5.5	6.1
Physical Properties at RT-Cured 10 min at 177 °C (351 °F)—Post-Cured 16 hr at 232 °C (450 °F)						
M50 (MPa)	1.20	1.25	1.28	1.41	1.45	1.60
M100 (MPa)	1.62	1.86	2.04	2.40	2.58	3.09
Tb (MPa)	12.0	12.4	12.6	13.5	12.5	13.0
Eb (%)	448	371	334	321	281	267
Hardness (Sh.A)	58	59	59	61	63	63
Tear Die B (kN/m)	32.3	33.4	32.4	30.0	32.1	29.8
Tear Die C (kN/m)	20.3	18.8	19.4	16.2	15.7	17.1
Trouser Tear (N/mm)	7.4	6.6	6.2	6.1	5.6	5.1
Compression Set, Method B, Plied						
Aged 22 hr at 200 °C (392 °F), %	23	14	9	8	6	10
Aged 70 hr at 200 °C (392 °F), %	35	23	22	18	18	15
Aged 168 hr at 200 °C (392 °F), %	44	34	29	26	25	24
Aged 336 hr at 200 °C (392 °F), %	55	44	39	36	35	33
Aged 504 hr at 200 °C (392 °F), %	57	47	43	42	40	40
Aged 1008 hr at 200 °C (392 °F), %	65	56	53	50	49	47
Aged 168 hr at 150 °C (302 °F), %	30	20	16	11	10	5
Aged 336 hr at 150 °C (302 °F), %	36	25	19	15	14	9
Aged 504 hr at 150 °C (302 °F), %	38	26	21	18	14	12
Aged 1008 hr at 150 °C (302 °F), %	43	29	26	21	18	16

Test Procedures

Property Measured	Test Procedure
Compression Set	ASTM D395, Method B (25% deflection)
Hardness	ASTM D1414, durometer A
Moving Die Rheometer (MDR)	ASTM D5289
Mooney Scorch	ASTM D1646, small rotor at 121 °C (250 °F)
Mooney Viscosity	ASTM D1646, ten pass at 121 °C (250 °F)
Property Change After Heat Aging	ASTM D573
Stress/Strain Properties 100% Modulus Tensile Strength (T-B) Elongation (E-B)	ASTM D412, pulled at 8.5 mm/sec (20 in/min)
Tear Die B and Tear Die C	ASTM D624

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

For more information, visit Viton.com

Replaces: C-10980

C-11542 (12/17)