

Table 50.121
Physical properties of Class 14 60°C (140°F) neoprene^a insulation

Conditions of specimens at time of measurement	Maximum set in recovery test (1-inch or 25-mm bench marks stretched to 3 inches or 75 mm)	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	25 percent (1/4 inch or 6.2 mm)	300 percent (3 inches or 75 mm)	1500 lbf/in ² or 10.3 MPa (MN/m ²) or 1034 N/cm ² or 1.05 kgf/mm ²
Aged in a full-draft circulating-air oven for 168 h at 70.0 ±1.0°C (158.0 ±1.8°F)	Not measured	65 percent of the result with unaged specimens where the sum of the tensile plus elongation percentages is at least 140. Otherwise, 70 percent of the result with unaged specimens.	
60°C (140°F) oil-resistant insulation Aged in oil for 18 h at 121.0 ±1.0°C (249.8 ±1.8°F)	Not measured	60 percent of the result with unaged specimens	60 percent of the result with unaged specimens

^a Class 13 neoprene designates a thermoset compound whose characteristic constituent is polychloroprene.

Table 50.122
Physical properties of Class 15 60°C (140°F) neoprene^a jacket

Condition of specimens at time of measurement	Maximum set in recovery test (1-inch or 25-mm bench marks stretched to (3 inches or 75 mm)	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	19 percent (3/16 inch or 4.8 mm)	300 percent (3 inches or 75 mm)	Jackets from 8 AWG and larger Type SOW and SO cables: 2800 lbf/in ² or 12.4 MPa (MN/m ²) or 1240 N/cm ² or 1.27 kgf/mm ² Other jackets: 1500 lbf/in ² or 10.3 MPa (MN/m ²) or 1034 N/cm ² or 1.05 kgf/mm ²
Aged in a full-draft circulating-air oven for 168 h at 70.0 ±1.0°C (158.0 ±1.8°F)	Not measured	70 percent of the result with unaged specimens	70 percent of the result with unaged specimens
60°C (140°F) oil-resistant jacket Aged in oil for 18 h at 121.0 ±1.0°C (249.8 ±1.8°F)	Not measured	60 percent of the result with unaged specimens	60 percent of the result with unaged specimens

^a Class 15 neoprene designates a thermoset compound whose characteristic constituent is polychloroprene.

Table 50.123

Physical properties of 75°C (167°F) neoprene^a jacket from CATV cables, power-limited circuit cable, cable for power-limited fire-alarm circuits, other cables, and from applications specifying a Class 16 jacket

Conditions of specimens at time of measurement	Maximum set in recovery test (1-inch or 25-mm bench marks stretched to 3 inches or 75 mm)	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	19 percent (3/16 inch or 4.8 mm)	300 percent (3 inches or 75 mm)	1500 lbf/in ² or 10.3 MPa (MN/m ²) or 1034 N/cm ² or 1.05 kgf/mm ²
Aged in a full-draft circulating-air oven for 240 h at 100.0 ±1.0°C (212.0 ±1.8°F)	Not measured	50 percent of the result with unaged specimens	70 percent of the result with unaged specimens
60°C (140°F) oil-resistant insulation Aged in oil for 18 h at 121.0 ±1.0°C (249.8 ±1.8°F)	Not measured	60 percent of the result with unaged specimens	60 percent of the result with unaged specimens

^a Class 16 neoprene designates a thermoset compound whose characteristic constituent is polychloroprene.

Table 50.124

Physical properties of 90°C (194°F) neoprene^a jacket from CATV cables, power-limited circuit cable, cable for power-limited fire-alarm circuits, other cables, and from cable for applications specifying a Class 17 insulation or jacket

Condition of specimens at time of measurement	Maximum set in recovery test (1-inch or 25-mm bench marks stretched to 3 inches or 75 mm)	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	25 percent (1/4 inch or 6.2 mm)	250 percent (2-1/2 inches or 62.5 mm)	1200 lbf/in ² or 8.27 MPa (MN/m ²) or 8.27 N/cm ² or 0.844 kgf/mm ²
Aged in a full-draft circulating-air oven for 240 h at 121.0 ±1.0°C (249.8 ±1.8°F)	Not measured	50 percent (1/2 inch or 12.5 mm)	900 lbf/in ² or 6.21 MPa (MN/m ²) or 621 N/cm ² or 0.633 kgf/mm ²
60°C (140°F) oil-resistant Class 17 insulation or jacket: Aged in oil for 18 h at 121.0 ±1.0°C (249.8 ±1.8°F)	Not measured	60 percent of the result with unaged specimens	60 percent of the result with unaged specimens

^a Class 17 neoprene designates a thermoset compound whose characteristic constituent is polychloroprene.

Table 50.125
Physical properties of Class 41 90°C (194°F) neoprene^a and NBR/PVC^b insulations and jackets

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	250 percent (2-1/2 inches or 62.5 mm)	1200 lbf/in ² or 8.27 MPa (MN/m ²) or 827 N/cm ² or 0.844 kgf/mm ²
Aged in a full-draft circulating-air oven for 240 h at 121.0±1.0°C (249.8 ±1.8°F)	50 percent (1/2 inch or 12.5 mm)	900 lbf/in ² 6.21 MPa (MN/m ²) or 621 N/cm ² or 0.633 kgf/mm ²
60°C (140°F) oil-resistant insulation or jacket: Aged in oil for 18 h at 121.0 ±1.0°C (249.8±1.8°F)	60 percent of the result with unaged specimens	60 percent of the result with unaged specimens

^a Class 41 neoprene designates a thermoset compound whose characteristic constituent is polychloroprene.
^b Class 41 NBR/PVC designates a thermoset compound whose characteristic constituents are acrylonitrile butadiene rubber and polyvinyl chloride.

Table 50.133
Physical properties of 75°C (167°F) LDFRPE^a and HDFRPE^b jackets from CATV cables and insulations from power-limited circuit cable and cable for power-limited fire-alarm circuits

Table 50.133 revised May 6, 2003

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks) ^c	Minimum tensile strength ^c
Unaged	100 percent (1 inch or 25 mm)	1200 lbf/in ² or 8.27 MPa (MN/m ²) or 827 N/cm ² or 0.844 kgf/mm ²
Aged in a full-draft circulating-air oven for 48 h at 100.0 ±1.0°C (212.0 ±1.8°F)	75 percent of the result with unaged specimens	75 percent of the result with unaged specimens

^a LDFRPE designates a compound whose characteristic constituent is thermoplastic polyethylene, with the base resin (uncolored material) having a nominal density in the range of 0.910 – 0.925 g/m³(resin identified as Type I in ASTM D 1248-02) and a high molecular weight.
^b HDFRPE designates high-density polyethylene, a compound whose characteristic constituent is thermoplastic polyethylene, with a base resin (uncolored material) having a nominal density in the range of 0.941 – 0.959 g/cm³(resin identified as Type III in ASTM D 1248-02) and a high molecular weight.
^c FRPE is to be tested at a speed of 2.0 ±0.2 in/min or 50 ±5 mm/min.

Table 50.135
Physical properties of 75°C (167°F) thermoplastic HDPE^a insulation from single-conductor Type USE cable

Table 50.135 revised May 6, 2003

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks) ^b	Minimum tensile strength ^b
Unaged	300 percent (3 inches or 75 mm)	2000 lbf/in ² 13.79 MPa (MN/m ²) or 1379 N/cm ² or 1.41 kgf/mm ²
Aged in a full-draft circulating-air oven for 168 h at 113.0 ±1.0°C (235.4 ±1.8°F)	60 percent of the result with unaged specimens	70 percent of the result with unaged specimens
^a HDPE designates a high-density-polyethylene compound whose characteristic constituent is thermoplastic polyethylene, with the base resin (uncolored, unfilled material) having a nominal density in the range 0.941– 0.959 g/cm ³ (resin identified as Type III in ASTM D 1248-02) and a high molecular weight. ^b HDPE is to be tested at a speed of 2.0 ±0.2 in/min or 50 ±5 mm/min.		

Table 50.136
Physical properties of 75°C (167°F) LDPE^a insulation from power-limited circuit cable, from cable for power-limited fire-alarm circuit cables, and from applications specifying Class 30 insulation; and physical properties of 75°C (167°F) HDPE^b insulation from power-limited circuit cable

Table 50.136 revised May 6, 2003

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks) ^c	Minimum tensile strength ^c
Unaged solid LDPE insulation	LDPE tube from air-gap coaxial member: 300 percent (3 inches or 75 mm) All other solid LDPE insulation: 350 percent (3-1/2 inches or 87.5 mm)	All solid LPDE insulation: 1400 lbf/in ² or 9.65 MPa (MN/m ²) or 965 N/cm ² or 0.984 kgf/mm ²
Unaged solid HDPE insulation	300 percent (3 inches or 75 mm)	2400 lbf/in ² or 16.5 MPa (MN/m ²) or 1665 N/cm ² or 1.69 kgf/mm ²
All solid LDPE and HDPE insulation: Aged in a full-draft circulating-air over for 48 h at 100.0 ±1.0°C (212.0 ±1.8°F)	75 percent of the result with unaged specimens	75 percent of the result with unaged specimens
^a LDPE designates a compound whose characteristic constituent is thermoplastic polyethylene, with the base resin (uncolored, unfilled material) having a nominal density in the range of 0.910 – 0.925 g/m ³ (resin identified as Type I in ASTM D 1248-02) and a high molecular weight. ^b HDPE designates a high-density-polyethylene compound whose characteristic constituent is thermoplastic polyethylene, with the base resin (uncolored, unfilled material) having a nominal density in the range of 0.941 – 0.959 g/cm ³ (resin identified as Type III in ASTM D 1248-02) and a high molecular weight.		

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Table 50.136 Continued

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks) ^c	Minimum tensile strength ^c
<p>^c PE with a density of 0.93 g/cm³(930 kg/m³) or higher is to be tested at a speed of 2.0 ±0.2 in/min or 50 ±5 mm/min. PE with a density lower than 0.93 g/cm³(930 kg/m³) is to be tested at a speed of 20 ±1 in/min or 500 ±25 mm/min. A quick, rough check of whether the density of a given piece of unfilled PE is below 0.93 g/cm³(930 kg/m³) is to immerse the insulation in olive, cottonseed, or coconut oil while the oil and PE are at room temperature (25°C or 77°F maximum). Unfilled material with a density lower than 0.93 g/cm³(930 kg/m³) rises to the surface and floats within a minute or so.</p>		

Table 50.137

Physical properties of PFA^a jacket from CATV cables, PFA^a insulation from Type PFA and PFAH wires, and PFA^a insulation or jacket from other wires and cables, also of 200°C (392°F) and 250°C (482°F) MFA^b insulations and jackets from appliance-wiring material

Table 50.137 revised May 6, 2003

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks) ^c	Minimum tensile strength ^c
Unaged	200 percent (2 inches or 50 mm)	2500 lbf/in ² or 17.2 MPA (MN/m ²) or 1724 N/cm ² or 1.76 kgf/mm ²
200°C (392°F) PFA insulation from Type PFA wire and insulation or jacket from CATV cables and from other wires and cables, also 200°C (392°F) MFA insulation or jacket from appliance-wiring material Aged in a full-draft circulating-air oven for 96 h at 260.0 ±2.0°C (500.0 ±3.6°F)	85 percent of the result with unaged specimens	85 percent of the result with unaged specimens
250°C (482°F) PFA insulation from Type PFAH wire and from other wires and cables, also 250°C (482°F) MFA insulation or jacket from appliance-wiring material Aged in a full-draft circulating-air oven for 168 h at 287.0 ±2.0°C (549.0 ±3.6°F)	85 percent of the result with unaged specimens	85 percent of the result with unaged specimens
<p>^a PFA designates a thermoplastic material whose characteristic constituent is the fluoropolymer resin perfluoroalkoxy. The material is uncompounded PFA to which a small amount of pigment, lubricant, or both is or is not added.</p> <p>^b MFA designates a thermoplastic material whose characteristic constituent is the fluoropolymer resin methylfluoroalkoxy. The material is uncompounded MFA to which a small amount of pigment, lubricant, or both is or is not added.</p> <p>^c PFA and MFA are to be tested at a speed of 20 ±1 in/min or 500 ±25 mm/min.</p>		

Table 50.139
Physical properties of 75°C (167°F) and 60°C (140°F) PP^a(polypropylene) insulation from power-limited circuit cable and from cable for power-limited fire-alarm circuits; and 75°C (167°F) PP^a jacket from CATV cables

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks) ^b	Minimum tensile strength ^b
Unaged	150 percent (1-1/2 inches or 38 mm)	3000 lbf/in ² or 20.7 MPa (MN/m ²) or 2068 N/cm ² or 2.11 kgf/mm ²
Aged in a full-draft circulating-air oven for 240 h (75°C or 167°F insulation) or for 168 h (60°C or 140°F insulation) at 100.0 ±1.0°C (212.0 ±1.8°F)	70 percent of the result with unaged specimens	70 percent of the result with unaged specimens
<p>^a PP designates a thermoplastic compound whose characteristic constituent is polypropylene, the crystalline copolymer of ethylene and propylene.</p> <p>^b PP is to be tested at a speed of 2.0 ±0.2 in/min or 50 ±5 mm/min.</p>		

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Table 50.140
Physical properties of PVC^a insulation from Type TW wire

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	100 percent (1 inch or 25 mm)	1500 lbf/in ² or 10.3 MPa (MN/m ²) or 1034 N/cm ² or 1.05 kgf/mm ²
Aged in a full-draft circulating-air oven for 168 h at 100.0 ±1.0°C (212.0 ±1.8°F)	Die-cut specimens: 45 percent of the result with unaged specimens Other specimens: 65 percent of the result with unaged specimens	Die-cut specimens: 65 percent of the result with unaged specimens Other specimens: 65 percent of the result with unaged specimens

^a PVC is described in note ^a to Table 50.155.

Table 50.142
Physical properties of PVC^a insulations and jackets from medium- and low-power broadband cables rated for 105, 90, 75, and 60°C

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	100 percent (1 inch or 25 mm)	2000 lbf/in ² or 13.79 MPa (MN/m ²) or 1379 N/cm ² or 1.41 kgf/mm ²
105°C (221°F) insulations and jackets: Aged in a full-draft circulating-air oven for 168 h at 136.0 ±1.0°C (276.8 ±1.8°F)	Die-cut and other specimens: 50 percent of the result with unaged specimens	Die-cut and other specimens: 85 percent of the result with unaged specimens
90°C (194°F) insulations and jackets: Aged in a full-draft circulating air oven for 168 h at 121.0 ±1.0°C (249.8 ±1.8°F)	Die-cut and other specimens: 50 percent of the result with unaged specimens	Die-cut and other specimens: 85 percent of the result with unaged specimens
75°C (167°F) insulations and jackets: Aged in a full-draft circulating-air oven for 240 h at 100.0 ±1.0°C (212.0 ±1.8°F)	Die-cut and other specimens: 50 percent of the result with unaged specimens	Die-cut and other specimens: 85 percent of the result with unaged specimens
60°C (140°F) insulations and jackets: Aged in a full-draft circulating-air oven for 168 h at 100.0 ±1.0°C (212.0 ±1.8°F)	Die-cut and other specimens: 50 percent of the result with unaged specimens	Die-cut and other specimens: 75 percent of the result with unaged specimens

Table 50.142 Continued

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
^a PVC designates a thermoplastic compound whose characteristic constituent is polyvinyl chloride or a copolymer of vinyl chloride and vinyl acetate.		

Table 50.144

Physical properties of insulation of thermoplastic other than PVC from Type THWN-2, THHN, and THWN wires

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)		Minimum tensile strength
Unaged	Values as established for the particular commercial or proprietary compound used		
Insulation from conductors of ACTHH, NM-B, and NMC-B cables and Type THHN and THWN-2 wires (nylon removed before aging): Aged in a full-draft circulating-air oven for 168 h at 136.0 ±1.0°C (276.8 ±1.8°F)	Die-cut specimens: 45 percent of the result with unaged specimens	Other specimens: 65 percent of the result with unaged specimens	All specimens: 75 percent of the result with unaged specimens
Insulation from Type THWN wire (nylon removed before aging): Aged in a full-draft circulating-air oven for 168 h at 121.0 ±1.0°C (249.8 ±1.8°F)	Die-cut specimens: 45 percent of the result with unaged specimens	Other specimens: 65 percent of the result with unaged specimens	All specimens: 75 percent of the result with unaged specimens

Table 50.145

Physical properties of PVC^a insulation from Type THW and THWN wires

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)		Minimum tensile strength
	Type THWN	Type THW ^b	Types THWN and THW ^b
Unaged	150 percent (1-1/2 inches or 38 mm)	150 percent (1-1/2 inches or 38 mm)	2000 lbf/in ² or 13.79 MPa (MN/m ²) or 1379 N/cm ² or 1.41 kgf/mm ²
Aged in a full-draft circulating-air oven for 168 h at 121.0 ±1.0°C (249.8 ±1.8°F)	Die-cut specimens: 45 percent of the result with unaged specimens Other specimens: 65 percent of the result with unaged specimens	Die-cut specimens: 35 percent of the result with unaged specimens Other specimens: 50 percent of the result with unaged specimens	All specimens: 75 percent of the result with unaged specimens
^a PVC designates a thermoplastic compound whose characteristic constituent is polyvinyl chloride or a copolymer of vinyl chloride and vinyl acetate.			

Table 50.145 Continued

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)		Minimum tensile strength
	Type THWN	Type THW ^b	Types THWN and THW ^b
^b For Type THW wire in which the PVC insulation is in two layers: <ol style="list-style-type: none"> 1) For the 14 – 7 AWG sizes, tubular specimens are to be tested as a whole. 2) For the 6 AWG and larger sizes, die-cut specimens prepared from each layer are to be tested separately. In each case, the layer not being tested is to be buffed away or otherwise removed before die-cut specimens are prepared for the layer being tested. 			

Table 50.150
Physical properties of PVC^a insulation from gasoline- and oil-resistant Type TFN, TFFN, THWN-2, and THWN wires

Table 50.150 revised October 31, 2001

Condition of PVC specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged (nylon removed)	150 percent (1-1/2 inches or 38 mm)	2000 lbf/in ² or 13.79 MPa (MN/m ²) or 1379 N/cm ² or 1.41 kgf/mm ²
Conditioned by immersion in water-saturated ASTM Reference Fuel C for 30 d at 23.0 ±1.0°C (73.4 ±1.8°F) with nylon intact during immersion and removed prior to testing	65 percent of the result with unaged specimens	75 percent of the result with unaged specimens
^a PVC designates a thermoplastic compound whose characteristic constituent is polyvinyl chloride or a copolymer of vinyl chloride and vinyl acetate.		

Table 50.155
Physical properties of PVC^a insulation from Type THW-2^b, THWN-2, THHW, and THHN wires and of Class 12B 90°C (194°F) PVC^a insulation from Type TFN and TFFN fixture wires

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)		Minimum tensile strength
	Types THHN, TFN, TFFN, and THWN-2	Types THW-2 ^b and THHW	Types THWN-2, THW-2 ^b , THHW, THHN, TFN, and TFFN
Unaged	150 percent (1-1/2 inches or 37.5 mm)		2000 lbf/in ² or 13.79 MPa (MN/m ²) or 1379 N/cm ² or 1.41 kgf/mm ²
Aged in a full-draft circulating-air oven for 168 h at 136.0 ±1.0°C (276.8 ±1.8°F) with nylon jacket removed before aging	Die-cut specimens:	Die-cut specimens:	All specimens:

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Table 50.155 Continued

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)		Minimum tensile strength
	Types THHN, TFN, TFFN, and THWN-2	Types THW-2 ^b and THHW	Types THWN-2, THW-2 ^b , THHW, THHN, TFN, and TFFN
	45 percent of the result with unaged specimens	35 percent of the result with unaged specimens	75 percent of the result with unaged specimens
	Other specimens: 65 percent of the result with unaged specimens	Other specimens: 50 percent of the result with unaged specimens	

^a PVC designates a thermoplastic compound whose characteristic constituent is polyvinyl chloride or a copolymer of vinyl chloride and vinyl acetate.

^b For Type THW-2 wire in which the PVC insulation is in two layers:

- 1) For the 14 – 7 AWG sizes, tubular specimens are to be tested as a whole.
- 2) For the 6 AWG and larger sizes, die-cut specimens prepared from each layer are to be tested separately. In each case, the layer not being tested is to be buffed away or otherwise removed before die-cut specimens are prepared for the layer being tested.

Table 50.156
Physical properties of oil-resistant Class 12B 90°C (194°F) PVC^a insulation

Oil-resistant rating of wire	Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
75°C (167°F)	Aged in oil for 60 d at 75.0 ±1.0°C (167.0 ±1.8°F)	65 percent of the result with unaged specimens	
60°C (140°F)	Aged in oil for 96 h at 100.0 ±1.0°C (212.0 ±1.8°F)	50 percent of the result with unaged specimens	

^a PVC is described in note ^a to Table 50.155.

Table 50.160
Physical properties of PVC insulation from Type TBS wire

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	100 percent (1 inch or 25 mm)	1500 lbf/in ² or 10.3 MPa (MN/m ²) or 1034 N/cm ² or 1.05 kgf/mm ²
Aged in a full-draft circulating-air oven for 168 h at 121.0 ±1.0°C (249.8 ±1.8°F) with all materials over the thermoplastic insulation removed before aging	Die-cut specimens: 45 percent of result with unaged specimens Other specimens: 65 percent of result with unaged specimens	Die-cut specimens: 70 percent of the result with unaged specimens Other specimens: 70 percent of the result with unaged specimens

^a PVC designates a thermoplastic compound whose characteristic constituent is polyvinyl chloride or a copolymer of vinyl chloride and vinyl acetate.

Table 50.165
Physical properties of Class 11 60°C (140°F) PVC^a insulation

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	200 percent (2 inches or 50 mm)	1600 lbf/in ² or 11.0 MPa (MN/m ²) or 1103 N/cm ² or 1.12 kgf/mm ²
Aged for 168 h in a full-draft circulating-air oven at 100.0 ±1.0°C (212.0 ±1.8°F)	50 percent of the result with unaged specimens	85 percent of the result with unaged specimens
60°C (140°F) oil-resistant insulation: Aged in oil for 168 h at 60.0 ±1.0°C (140.0 ±1.8°F)	85 percent of the result with unaged specimens	85 percent of the result with unaged specimens
Aged in oil for 60 days at 60.0 ±1.0°C (140.0 ±1.8°F)	75 percent of the result with unaged specimens	75 percent of the result with unaged specimens

^a Class 11 PVC designates a thermoplastic compound whose characteristic constituent is polyvinyl chloride or a copolymer of vinyl chloride and vinyl acetate.

Table 50.166
Physical properties of Class 11 60°C (140°F) PVC^a insulation and jacket

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	200 percent (2 inches or 50 mm)	1600 lbf/in ² or 11.0 MPa (MN/m ²) or 1103 N/cm ² or 1.12 kgf/mm ²
Aged for 168 h in a full-draft circulating-air oven at 100.0 ±1.0°C (212.0 ±1.8°F)	60 percent of the result with unaged specimens	85 percent of the result with unaged specimens
60°C (140°F) oil-resistant jacket: Aged in oil for 168 h at 60.0 ±1.0°C (140.0 ±1.8°F)	75 percent of the result with unaged specimens	75 percent of the result with unaged specimens

^a Class 11 PVC is described in note ^a to Table 50.165.

Table 50.167
Physical properties of Class 11 60°C (140°F) PVC^a jacket

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	225 percent (2-1/4 inches or 56.3 mm)	1800 lbf/in ² or 12.4 MPa (MN/m ²) or 1240 N/cm ² or 1.27 kgf/mm ²
Aged for 168 h in a full-draft circulating-air oven at 100.0 ±1.0°C (212.0 ±1.8°F)	60 percent of the result with unaged specimens	85 percent of the result with unaged specimens
60°C (140°F) oil-resistant jacket: Aged in oil for 168 h at 60.0 ±1.0°C (140.0 ±1.8°F)	75 percent of the result with unaged specimens	75 percent of the result with unaged specimens

^a Class 11 PVC is described in note ^a to Table 50.165.

Table 50.169
Physical properties of Class 11 60°C (140°F) PVC^a insulation and jacket

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	200 percent (2 inches or 50 mm)	1600 lbf/in ² or 11.0 MPa (MN/m ²) or 1103 N/cm ² or 1.12 kgf/mm ²
Aged in a full-draft circulating-air oven at 100.0±1.0°C (212.0 ±1.8°F)	Die-cut specimens of insulation: 45 percent of the result with unaged specimens Other specimens: 60 percent of the result with unaged specimens	Die-cut specimens: 85 percent of the result with unaged specimens Other specimens: 85 percent of the result with unaged specimens

^a Class 11 PVC is described in note ^a to Table 50.165.

Table 50.172
Physical properties of Class 11 60°C (140°F) PVC^a jacket

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	200 percent (2 inches or 50 mm)	1600 lbf/in ² or 11.0 MPa (MN/m ²) or 1103 N/cm ² or 1.12 kgf/mm ²
Aged for 168 h in a full-draft circulating-air oven at 100.0 ±1.0°C (212.0 ±1.8°F)	45 percent of the result with unaged specimens	85 percent of the result with unaged specimens
60°C (140°F) oil-resistant jacket: Aged in for 168 h at 60.0 ±1.0°C (140.0 ±1.8°F)	75 percent of the result with unaged specimens	75 percent of the result with unaged specimens

^a Class 11 PVC is described in note ^a to Table 50.165.

Table 50.175
Physical properties of PVC^a jacket from cable for deep-well submersible water pumps

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	100 percent (1 inch or 25 mm)	1500 lbf/in ² or 10.3 MPa (MN/m ²) or 1034 N/cm ² or 1.05 kgf/mm ²
Aged in a full-draft circulating-air oven for 168 h at 100.0 ±1.0°C (212.0 ±1.8°F)	Die-cut specimens: 45 percent of the result with unaged specimens Other specimens: 65 percent of the result with unaged specimens	Die-cut Specimens: 65 percent of the result with unaged specimens Other specimens: 65 percent of the result with unaged specimens

^a PVC designates a thermoplastic compound whose characteristic constituent is polyvinyl chloride or a copolymer of vinyl chloride and vinyl acetate.

Table 50.179
Physical properties of Class 12 75°C (167°F) PVC^a insulation and jacket

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	100 percent (1 inch or 25 mm)	1500 lbf/in ² or 10.3 MPa (MN/m ²) or 1034 N/cm ² or 1.05 kgf/mm ²
Aged for 240 h in a full-draft circulating-air oven at 100.0 ±1.0°C (212.0 ±1.8°F)	Die-cut specimens: 45 percent of the result with unaged specimens Other specimens: 65 percent of the result with unaged specimens	Die-cut specimens: 70 percent of the result with unaged specimens Other specimens: 70 percent of the result with unaged specimens
60°C (140°F) oil-resistant jacket: Aged in oil for 168 h at 60.0 ±1.0°C (140.0 ±1.8°F)	75 percent of the result with unaged specimens	75 percent of the result with unaged specimens
60°C (140°F) oil-resistant insulation: Aged in oil for 168 h at 60.0 ±1.0°C (140.0 ±1.8°F)	85 percent of the result with unaged specimens	85 percent of the result with unaged specimens
Aged in oil for 60 d at 60.0 ±1.0°C (140.0 ±1.8°F)	75 percent of the result with unaged specimens	75 percent of the result with unaged specimens

^a Class 12 PVC designates a thermoplastic compound whose characteristic constituent is polyvinyl chloride or a copolymer of vinyl chloride and vinyl acetate.

Table 50.180
Physical properties of Class 12 90°C (194°F) PVC^a insulation and jacket

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	100 percent (1 inch or 25 mm)	1500 lbf/in ² or 10.3 MPa (MN/m ²) or 1034 N/cm ² or 1.05 kgf/mm ²
Aged for 168 h in a full-draft circulating-air oven at 121.0 ±1.0°C (249.8 ±1.8°F)	Die-cut specimens: 45 percent of the result with unaged specimens Other specimens: 65 percent of the result with unaged specimens	Die-cut specimens: 70 percent of the result with unaged specimens Other specimens: 65 percent of the result with unaged specimens
60°C (140°F) oil-resistant jacket: Aged in oil for 168 h at 60.0 ±1.0°C (140.0 ±1.8°F)	75 percent of the result with unaged specimens	75 percent of the result with unaged specimens
60°C (140°F) oil-resistant insulation: Aged in oil for 168 h at 60.0 ±1.0°C (140.0 ±1.8°F)	85 percent of the result with unaged specimens	85 percent of the result with unaged specimens
Aged in oil for 60 d at 60.0 ±1.0°C (140.0 ±1.8°F)	75 percent of the result with unaged specimens	75 percent of the result with unaged specimens
^a Class 12 PVC is described in note ^a to Table 50.179.		

Table 50.181
Physical properties of Class 12 105°C (221°F) PVC^a insulation and jacket

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	100 percent (1 inch or 25 mm)	1500 lbf/in ² or 10.3 MPa (MN/m ²) or 1034 N/cm ² or 1.05 kgf/mm ²
Aged for 168 h in a full-draft circulating-air oven at 136.0 ±1.0°C (276.8 ±1.8°F)	Die-cut specimens: 45 percent of the result with unaged specimens Other specimens: 65 percent of the result with unaged specimens	Die-cut specimens: 70 percent of the result with unaged specimens Other specimens: 70 percent of the result with unaged specimens
60°C (140°F) oil-resistant jacket: Aged in oil for 168 h at 60.0 ±1.0°C (140.0 ±1.8°F)	75 percent of the result with unaged specimens	75 percent of the result with unaged specimens

Table 50.181 Continued on Next Page

Table 50.181 Continued

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
60°C (140°F) oil-resistant insulation: Aged in oil for 168 h at 60.0 ±1.0°C (140.0 ±1.8°F)	85 percent of the result with unaged specimens	85 percent of the result with unaged specimens
Aged in oil for 60 d at 60.0 ±1.0°C (140.0 ±1.8°F)	75 percent of the result with unaged specimens	75 percent of the result with unaged specimens
^a Class 12 PVC is described in note ^a to Table 50.179.		

Table 50.182

Physical properties of 60°C (140°F), 75°C (167°F), 90°C (194°F), and 105°C (221°F) PVC^a jackets from CATV cables, and insulations and jackets from power-limited circuit cable, from cable for power-limited fire-alarm circuits, or from other cables and from applications specifying a Class 43 insulation or jacket

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	100 percent (1 inch or 25 mm)	1500 lbf/in ² or 10.3 MPa (MN/m ²) or 1034 N/cm ² or 1.05 kgf/mm ²
Aged in a full-draft circulating-air oven for the specified time at the specified temperature ^b	Die-cut specimens: 45 percent of the result with unaged specimens Other specimens: 65 percent of the result with unaged specimens	Die-cut specimens: 70 percent of the result with unaged specimens Other specimens: 70 percent of the result with unaged specimens
60°C (140°F) oil-resistant Class 43 jacket: Aged in oil for 168 h at 60.0 ±1.0°C (140.0 ±1.8°F)	75 percent of the result with unaged specimens	75 percent of the result with unaged specimens
60°C (140°F) oil-resistant Class 43 insulation: Aged in oil for 168 h at 60.0 ±1.0°C (140.0 ±1.8°F)	85 percent of the result with unaged specimens	85 percent of the result with unaged specimens
60°C (140°F) oil-resistant uses other than in flexible cords and elevator cables: Aged in oil for 60 d at 60.0 ±1.0°C (140 ±1.8°F)	75 percent of the result with unaged specimens	75 percent of the result with unaged specimens

Table 50.182 Continued

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)		Minimum tensile strength																	
<p>^a Class 43 PVC designates a thermoplastic compound whose characteristic constituent is polyvinyl chloride or a copolymer of vinyl chloride and vinyl acetate.</p> <p>^b The oven time and temperature are to be as follows:</p> <table border="1"> <thead> <tr> <th rowspan="2">Temperature rating of insulation</th> <th colspan="2">Specified oven time and temperature</th> </tr> <tr> <th>h</th> <th>°C (°F)</th> </tr> </thead> <tbody> <tr> <td>60°C (140°F)</td> <td>168</td> <td>100.0 ±1.0°C (212.0±1.8°F)</td> </tr> <tr> <td>75°C (167°F)</td> <td>240</td> <td>100.0 ±1.0°C (212.0 ±1.8°F)</td> </tr> <tr> <td>90°C (194°F)</td> <td>168</td> <td>121.0 ±1.0°C (249.8 ±1.8°F)</td> </tr> <tr> <td>105°C (221°F)</td> <td>168</td> <td>136.0 ±1.0°C (276.8±1.8°F)</td> </tr> </tbody> </table>				Temperature rating of insulation	Specified oven time and temperature		h	°C (°F)	60°C (140°F)	168	100.0 ±1.0°C (212.0±1.8°F)	75°C (167°F)	240	100.0 ±1.0°C (212.0 ±1.8°F)	90°C (194°F)	168	121.0 ±1.0°C (249.8 ±1.8°F)	105°C (221°F)	168	136.0 ±1.0°C (276.8±1.8°F)
Temperature rating of insulation	Specified oven time and temperature																			
	h	°C (°F)																		
60°C (140°F)	168	100.0 ±1.0°C (212.0±1.8°F)																		
75°C (167°F)	240	100.0 ±1.0°C (212.0 ±1.8°F)																		
90°C (194°F)	168	121.0 ±1.0°C (249.8 ±1.8°F)																		
105°C (221°F)	168	136.0 ±1.0°C (276.8±1.8°F)																		

Table 50.183

Physical properties of 105°C (221°F), 90°C (194°F), 75°C (167°F), and 60°C (140°F) semirigid PVC^a insulations and 75°C (167°F) and 60°C (140°F) jackets from CATV cables, from power-limited circuit cable, from cable for power-limited fire-alarm circuits, and from other cables

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks) ^b	Minimum tensile strength ^b																	
Unaged	100 percent (1 inch or 25 mm)	3000 lbf/in ² or 20.7 MPa (MN/m ²) or 2068 N/cm ² or 2.11 kgf/mm ²																	
Aged in a full-draft circulating-air oven for the specified time ^c at the specified temperature ^c	70 percent of the result with unaged specimens ^d	70 percent of the result with unaged specimens ^d																	
<p>^a Semirigid PVC (SRPVC) designates a partially plasticized thermoplastic compound whose characteristic constituent is polyvinyl chloride or a copolymer of vinyl chloride and vinyl acetate.</p> <p>^b Semirigid PVC is to be tested at a speed of 2.0 ±0.2 in/min or 50 ±5 mm/min.</p> <p>^c The oven time and temperature are to be as follows:</p> <table border="1"> <thead> <tr> <th rowspan="2">Temperature rating of insulation or jacket</th> <th colspan="2">Specified oven time and temperature</th> </tr> <tr> <th>h</th> <th>°C (°F)</th> </tr> </thead> <tbody> <tr> <td>105°C (221°F)</td> <td>168</td> <td>136.0 ±1.0°C (276.8±1.8°F)</td> </tr> <tr> <td>90°C (194°F)</td> <td>168</td> <td>121.0 ±1.0°C (249.8 ±1.8°F)</td> </tr> <tr> <td>75°C (167°F)</td> <td>168</td> <td>113.0 ±1.0°C (235.4 ±1.8°F)</td> </tr> <tr> <td>60°C (140°F)</td> <td>168</td> <td>100.0 ±1.0°C (212.0 ±1.8°F)</td> </tr> </tbody> </table>			Temperature rating of insulation or jacket	Specified oven time and temperature		h	°C (°F)	105°C (221°F)	168	136.0 ±1.0°C (276.8±1.8°F)	90°C (194°F)	168	121.0 ±1.0°C (249.8 ±1.8°F)	75°C (167°F)	168	113.0 ±1.0°C (235.4 ±1.8°F)	60°C (140°F)	168	100.0 ±1.0°C (212.0 ±1.8°F)
Temperature rating of insulation or jacket	Specified oven time and temperature																		
	h	°C (°F)																	
105°C (221°F)	168	136.0 ±1.0°C (276.8±1.8°F)																	
90°C (194°F)	168	121.0 ±1.0°C (249.8 ±1.8°F)																	
75°C (167°F)	168	113.0 ±1.0°C (235.4 ±1.8°F)																	
60°C (140°F)	168	100.0 ±1.0°C (212.0 ±1.8°F)																	
<p>^d As an alternative to testing for retention of tensile strength and elongation, it is appropriate to wind aged specimens of the 60°C (140°F) insulation in place on the conductor onto a mandrel as described under "Flexibility" in the applicable wire Standard. Unaged specimens are to be tested for tensile strength and elongation. Where aged specimens that are tested for retention of tensile strength and elongation show results that do not comply, it is appropriate to use the flexibility procedure described under "Flexibility" as a referee test.</p>																			

Table 50.185
Physical properties of 150°C (302°F) and 125°C (257°F) PVDF^a and PVDF copolymer^b jackets
from CATV cables; and insulations and jackets from power-limited circuit cable and from cable
for power-limited fire-alarm circuits

Table 50.185 revised May 6, 2003

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks) ^c	Minimum tensile strength ^c
Unaged	100 percent (1 inch or 25 mm)	3500 lbf/in ² or 24.1 MPa (MN/m ²) or 2413 N/cm ² or 2.46 kgf/mm ²
Specimens of 150°C (302°F) material: Aged in a full-draft circulating-air oven for 60 d at 158.0 ±1.0°C (316.4 ±1.8°F)	50 percent of the result with unaged specimens	50 percent of the result with unaged specimens
Specimens of 125°C (257°F) material: Aged in a full-draft circulating-air oven for 168 h at 158.0 ±1.0°C (316.4 ±1.8°F)	See note ^d	See note ^d
or as an option for PVDF copolymer only: aged in a full-draft circulating-air oven for 30 d at 136.0 ±1.0°C (276.8 ±1.8°F)	See note ^d	See note ^d
<p>^a PVDF designates a thermoplastic material whose characteristic constituent is the homopolymer resin polyvinylidene fluoride. The material is uncompounded PVDF to which it is appropriate to add a small amount of pigment, lubricant, or both.</p> <p>^b PVDF copolymer designates a thermoplastic material whose characteristic constituent is a copolymer of polyvinylidene fluoride and hexafluoropropylene. The material is the uncompounded polymer to which it is appropriate to add a small amount of pigment, lubricant, or both.</p> <p>^c PVDF and PVDF copolymer are to be tested at a speed of 2.0±0.2 in/min or 50 ±5 mm/min.</p> <p>^d Aged specimens of the jacket, of the foamed insulation in place on the conductor, or the solid insulation in place on the conductor are to be wound onto a mandrel as described under "Flexibility" in the applicable wire Standard. Unaged specimens of the jacket and of the solid insulation are to be tested for tensile strength and elongation. Jacket damage after aging caused by outgassing of lower-temperature insulated conductors within the cable does not constitute noncomplying performance.</p>		

Table 50.189
Physical properties of SBR/IIR/NR^a insulation from Type RH, RHW-2, RHW, and RHH wires

Condition of specimens at time of measurement	Maximum set for 75°C (167°F) compounds – inapplicable for 90°C (194°F) compounds (1-inch or 25-mm bench marks stretched to 2-1/2 inches or 62.5 mm)	Maximum set for 90°C (194°F) compounds – inapplicable for 75°C (167°F) compounds (1-inch or 25-mm bench marks stretched to 3 inches or 75 mm)	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	25 percent (1/4 inch or 6.2 mm)	25 percent (1/4 inch or 6.2 mm)	300 percent (3 inches or 75 mm)	700 lbf/in ² or 4.83 MPa (MN/m ²) or 483 N/cm ² or 0.492 kgf/mm ²
75°C (167°F) compounds aged in a full-draft circulating-air oven for 240 h at 100.0 ±1.0°C (212.0 ±1.8°F)	Not measured	–	50 percent of the result with unaged specimens	70 percent of the result with unaged specimens
90°C (194°F) compounds aged in a full-draft circulating-air oven for 168 h at 121.0 ±1.0°C (249.8 ±1.8°F)	–	Not measured	60 percent of the result with unaged specimens	60 percent of the result with unaged specimens

^a SBR/IIR/NR designates a thermoset compound whose characteristic constituent is SBR, IIR (butyl rubber), blends of SBR and IIR, or blends of SBR and/or IIR with NR (natural rubber). These thermosets are for use where subjected to 75°C (167°F) and lower temperatures as insulation on NBR/PVC-, CP-, or neoprene-jacketed or fibrous-covered Type RHW and RH wires and where subjected to 90°C (194°F) and lower temperatures as insulation on CP- or neoprene-jacketed or fibrous-covered Type RHW-2 and RHH wires.

Table 50.193
Physical properties of Class 2 60°C (140°F) SBR/NR^a insulation

Condition of specimens at time of measurement	Maximum set in recovery test (1-inch or 25-mm bench marks stretched to 2-1/2 inches or 62.5 mm)	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength (test not required for insulation less than 30 mils or 0.76 mm thick)
Unaged	25 percent (1/4 inch or 6.2 mm)	200 percent (3 inches or 75 mm)	500 lbf/in ² or 3.45 MPa (MN/m ²) or 345 N/cm ² or 0.352 kgf/mm ²
Aged in a full-draft circulating-air oven for 168 h at 70.0 ±1.0°C (158.0 ±1.8°F)	Not measured	65 percent of the result with unaged specimens	75 percent of the result with unaged specimens

^a Class 2 SBR/NR designates a thermoset compound whose characteristic constituent is SBR, NR (natural rubber), or a blend of the two.

Table 50.194
Physical properties of Class 3 60°C (140°F) SBR/NR^a insulation

Condition of specimens at time of measurement	Maximum set in recovery test (1-inch or 25-mm bench marks stretched to 2-1/2 inches or 62.5 mm)	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength (test not required for insulation less than 30 mils or 0.76 mm thick)
Unaged	25 percent (1/4 inch or 6.2 mm)	250 percent (2-1/2 inches or 62.5 mm)	600 lbf/in ² or 4.14 MPa (MN/m ²) or 414 N/cm ² or 0.422 kgf/mm ²
Aged in a full-draft circulating-air oven for 168 h at 70.0 ±1.0°C (158.0 ±1.8°F)	Not measured	65 percent of the result with unaged specimens where the sum of tensile plus elongation percentages is at least 140 percent. Otherwise, 70 percent of the result with unaged specimens.	

^a Class 3 SBR/NR designates a thermoset compound whose characteristic constituent is SBR, NR (natural rubber), or a blend of the two.

Table 50.195
Physical properties of Class 4 60°C (140°F) SBR/NR^a insulation

Condition of specimens at time of measurement	Maximum set in recovery test (1-inch or 25-mm bench marks stretched to 3 inches or 75 mm)	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	25 percent (1/4 inch or 6.2 mm)	350 percent (3-1/2 inches or 87.5 mm)	1500 lbf/in ² or 10.3 MPa (MN/m ²) or 1034 N/cm ² or 1.05 kgf/mm ²
Aged in a full-draft circulating-air oven for 168 h at 70.0 ±1.0°C (158.0 ±1.8°F)	Not measured	65 percent of the result with unaged specimens where the sum of tensile plus elongation percentages is at least 140 percent. Otherwise, 70 percent of the result with unaged specimens.	

^a Class 4 SBR/NR designates a thermoset compound whose characteristic constituent is SBR, NR (natural rubber), or a blend of the two.

Table 50.196
Physical properties of Class 6 60°C (140°F) SBR/NR^a insulation

Condition of specimens at time of measurement	Maximum set in recovery test (1-inch or 25-mm bench marks stretched to 3 inches or 75 mm)	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	19 percent (3/16 inch or 4.8 mm)	300 percent (3 inches or 75 mm)	Jackets from 8 AWG and larger Type S cords: 1800 lbf/in ² or 12.4 MPa (MN/m ²) or 1240 N/cm ² or 1.27 kgf/mm ² Other jackets: 1500 lbf/in ² or 10.3 MPa (MN/m ²) or 1034 N/cm ² or 1.05 kgf/mm ²
Aged in a full-draft circulating-air oven for 168 h at 70.0 ±1.0°C (158.0 ±1.8°F)	Not measured	65 percent of the result with unaged specimens where the sum of tensile plus elongation percentages is at least 140 percent. Otherwise, 70 percent of the result with unaged specimens.	

^a Class 6 SBR/NR designates a thermoset compound whose characteristic constituent is SBR, NR (natural rubber), or a blend of the two.

Table 50.197
Physical properties of Class 7 75°C (167°F) SBR/NR^a insulation

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	300 percent (3 inches or 75 mm)	700 lbf/in ² or 4.83 MPa (MN/m ²) or 483 N/cm ² or 0.492 kgf/mm ²
Aged in a full-draft circulating-air oven for 240 h at 100.0 ±1.0°C (212.0 ±1.8°F)	50 percent of the result with unaged specimens	70 percent of the result with unaged specimens

^a Class 7 SBR/NR designates a thermoset compound whose characteristic constituent is SBR, NR (natural rubber), or a blend of the two.

Table 50.198
Physical properties of Class 8 75°C (167°F) SBR/NR^a insulation

Condition of specimens at time of measurement	Maximum set in recovery test (1-inch or 25-mm bench marks stretched to 2-1/2 inches or 62.5 mm)	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	25 percent (1/4 inch or 6.2 mm)	250 percent (2-1/2 inches or 62.5 mm)	600 lbf/in ² or 4.14 MPa (MN/m ²) or 414 N/cm ² or 0.422 kgf/mm ²
Aged in a full-draft circulating-air oven for 240 h at 100.0 ±1.0°C (212.0 ±1.8°F)	Not measured	50 percent of the result with unaged specimens	70 percent of the result with unaged specimens

^a Class 8 SBR/NR designates a thermoset compound whose characteristic constituent is SBR, NR (natural rubber), or a blend of the two.

Table 50.199
Physical properties of Class 10 75°C (167°F) SBR/NR^a jacket

Condition of specimens at time of measurement	Maximum set in recovery test (1-inch or 25-mm bench marks stretched to 2-1/2 inches or 62.5 mm)	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	19 percent (3/16 inch or 4.8 mm)	300 percent (3 inches or 75 mm)	1500 lbf/in ² or 10.3 MPa (MN/m ²) or 1034 N/cm ² or 1.05 kgf/mm ²
Aged in a full-draft circulating-air oven for 240 h at 100.0 ±1.0°C (212.0 ±1.8°F)	Not measured	50 percent of the result with unaged specimens	70 percent of the result with unaged specimens

^a Class 10 SBR/NR designates a thermoset compound whose characteristic constituent is SBR, NR (natural rubber), or a blend of the two.

Table 50.200
Physical properties of Class 40 60°C (140°F) SBR/NR^a insulation

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength (test not required for insulation less than 30 mils or 0.76 mm thick)
Unaged	200 percent (2 inches or 50 mm)	500 lbf/in ² or 3.45 MPa (MN/m ²) or 345 N/cm ² or 0.352 kgf/mm ²
Aged in a full-draft circulating-air oven for 168 h at 70.0 ±1.0°C (158.0 ±1.8°F)	65 percent of the result with unaged specimens	60 percent of the result with unaged specimens

^a Class 40 SBR/NR designates a thermoset compound whose characteristic constituent is SBR, NR (natural rubber), or a blend of the two.

Table 50.205
Physical properties 200°C (392°F) silicone rubber^a insulation from Type SA wire

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	250 percent (2-1/2 inches or 62.5 mm)	800 lbf/in ² or 5.52 MPa (MN/m ²) or 552 N/cm ² or 0,562 kgf/mm ²
Aged in a full-draft circulating-air oven for 60 d at 210.0 ±1.0°C (410.0 ±1.8°F)	25 percent of the result with unaged specimens	60 percent of the result with unaged specimens

^a Silicone rubber designates a thermoset compound whose characteristic constituent is poly-organo-siloxane.

Table 50.206
Physical properties of silicone rubber^a insulation from Type RHH wire

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	250 percent (2-1/2 inches or 62.5 mm)	800 lbf/in ² or 5.52 MPa (MN/m ²) or 552 N/cm ² or 0.562 kgf/mm ²
Aged in a full-draft circulating-air oven for 60 d at 136.0 ±1.0°C (276.8 ±1.8°F)	65 percent of the result with unaged specimens	75 percent of the result with unaged specimens

^a Silicone rubber designates a thermoset compound whose characteristic constituent is poly-organo-siloxane.

Table 50.210

Physical properties 200°C (392°F) and 150°C (302°F) silicone rubber^a jackets from CATV cables and insulations from power-limited circuit cable, from cable for power-limited fire-alarm circuits, from other cables, and from applications specifying Class 22 insulation

Temperature rating of insulation	Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
150°C (302°F) or 200°C (392°F)	Unaged	100 percent (1 inch or 25 mm)	500 lbf/in ² or 3.45 MPa (MN/m ²) or 345 N/cm ² or 0.352 kgf/mm ²
150°C (302°F)	Aged in a full-draft circulating-air oven for 60 d at 158.0 ±1.0°C (316.4 ±1.8°F)	50 percent (1/2 inch or 12.5) or 25 percent of the result with unaged specimens	500 lbf/in ² or 3.45 MPa (MN/m ²) or 345 N/cm ² or 0.352 kgf/mm ² or 60 percent of the result with unaged specimens
200°C (392°F)	Aged in a full-draft circulating-air oven for 60 d at 210.0 ±1.0°C (410.0 ±1.8°F)	50 percent (1/2 inch or 12.5 mm) or 25 percent of the result with unaged specimens	500 lbf/in ² or 3.45 MPa (MN/m ²) or 345 N/cm ² or 0.352 kgf/mm ² or 60 percent of the result with unaged specimens

^a Silicone rubber designates a thermoset compound whose characteristic constituent is poly-organo-siloxane.

Table 50.219

Physical properties of 250°C (482°F) PTFE^a (TFE^a) jacket from CATV cables and insulations from power-limited circuit cable, from cable for power-limited fire-alarm circuits, from other cables, and from Type PTF, PTF, and TFE wires; and of Class 12C PTFE^a insulation

Table 50.219 revised October 31, 2001

Condition of specimens at time of measurement	Minimum ultimate elongation (1-inch or 25-mm bench marks)	Minimum tensile strength
Unaged	175 percent (1-3/4 inches or 43.8 mm)	4000 lbf/in ² or 27.6 MPa (MN/m ²) or 2758 N/cm ² or 2.81 kgf/mm ²
Aged in a full-draft circulating-air oven for 60 d at 260.0 ±1.0°C (500.0 ±1.8°F)	85 percent of the result with unaged specimens	85 percent of the result with unaged specimens

^a PTFE (TFE) designates a thermoplastic material whose characteristic constituent is either the homopolymer tetrafluoroethylene (TFE) or a copolymer of TFE with no more than 1 percent by weight of another fluoropolymer. The material is uncompounded PTFE (TFE) to which a small amount of pigment, lubricant, or both is or is not added.

^b PTFE (TFE) is to be tested at a speed of 20 ±1 in/min or 500 ±25 mm/min.