

SI-LINK™ DFDA-5451 NT

Crosslinkable Polyethylene for Moisture Curable Power Cable Insulation

Overview

SI-LINK™ Crosslinkable Polyethylene DFDA-5451 NT is an ethylene-silane copolymer developed for use in power cable and control cable applications up to 1 kV.

DFDA-5451 NT may be crosslinked after it is extruded with the DFDB-5480 NT catalyst masterbatch by exposing it to moisture after cable manufacture. If a black product is required for UV protection, the addition of DFDB-5410 BK carbon black masterbatch is recommended.

Because the catalyst and carbon black masterbatches are shipped separate from the DFDA-5451 NT copolymer, the components are very shelf stable. Crosslinking of the total system only occurs after hot melt mixing of the components and exposure to moisture.

Specifications

When DFDA-5451 NT is crosslinked with DFDB-5480 NT, and optionally, DFDB-5410 BK, it meets typical 1 kV or less low voltage specifications such as those in:

- UL 854
- ICEA: S-66-524
- CSA RW90
- IEC: 60502-1

Physical	Nominal Value (English)	Nominal Value (SI)	Test Method
Density	0.922 g/cm ³	0.922 g/cm ³	ASTM D792
Melt Mass-Flow Rate (190°C/2.16 kg)	1.5 g/10 min	1.5 g/10 min	ASTM D1238
Mechanical	Nominal Value (English)	Nominal Value (SI)	Test Method
Tensile Strength	2400 psi	16.5 MPa	ASTM D638 ¹
Tensile Elongation (Break)	350 %	350 %	ASTM D638 ¹
Thermal	Nominal Value (English)	Nominal Value (SI)	Test Method
Hot Creep - 15 min, 20N/cm ² (302°F (150°C))	< 100 %	< 100 %	ICEA T-28-562 ²
Hot Set - 15 min, 0.2 MPa (392°F (200°C))	< 100 %	< 100 %	IEC 60811-2-1 ²
Aging	Nominal Value (English)	Nominal Value (SI)	Test Method
Retention of Tensile Elongation - 7 days 250°F (121°C)	95 %	95 %	ASTM D638 ¹
Retention of Tensile Strength - 7 days 250°F (121°C)	90 %	90 %	ASTM D638 ¹
Electrical	Nominal Value (English)	Nominal Value (SI)	Test Method
Dielectric Constant (1 kHz)	2.30	2.30	ASTM D150 ¹
Dissipation Factor (60 Hz)	0.00025	0.00025	ASTM D150 ¹
Extrusion	Nominal Value (English)	Nominal Value (SI)	
Drying Temperature	140 to 160 °F	60.0 to 71.1 °C	
Drying Time	4.0 to 6.0 hr	4.0 to 6.0 hr	
Melt Temperature	300 to 450 °F	149 to 232 °C	



Extrusion Notes

DFDA-5451 NT will extrude with excellent surface quality and without extrusion scorch if the accompanying catalyst masterbatch, DFDB-5480 NT and the carbon black masterbatch, DFDB-5410 BK, are kept dry. It is especially recommended that the catalyst and carbon masterbatches be dried at 140°F-160°F (60°-70°C) for four to six hours using dehumidified air prior to mixing and extrusion. Melt temperatures in the range of 300°F-450°F (150-230°C) have been successfully used.

After extrusion of the appropriate mixture of this product and its catalyst and carbon black masterbatches, cross-linking can be achieved by allowing moisture to diffuse into the product. Most fabricators find that a hot water bath or sauna works best. To achieve a hot creep elongation of 100%, the typical times shown below are required (45 mil [1.1 mm] wall on 14 AWG [2.1 mm²] wire).

- 70°C: 10 hrs
- 90°C: 3.5 hrs

Specific recommendations for your particular equipment and conditions can be determined by contacting your local Dow Wire and Cable sales representative.

Notes

These are typical properties only and are not to be construed as specifications. Users should confirm results by their own tests.

¹ Crosslinked polyethylene properties (95% DFDA-5451 NT, 5% DFDB-5480 NT)

² Measured on 14 AWG (2.1 mm²) wire with a 30 mil (0.75 mm) wall after 4 hours curing in 90°C water.
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