



SI-LINK™ AC DFDB-5451 NT

Crosslinkable Polyethylene for Moisture Curable Power Cable Insulation

Overview

SI-LINK™ AC Crosslinkable Polyethylene DFDB-5451 NT is a scorch retardant ethylene- silane-copolymer developed for use in power cable and control cable applications up to 1 kV. DFDB-5451 NT may be crosslinked under ambient conditions after it is extruded with the DFDA-5488 NT catalyst masterbatch. If a black product is required for UV protection, the addition of DFDB-5410 BK is recommended.

Because the catalyst and carbon black masterbatches are shipped separately from the DFDB-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 and temperature.

Specifications

When DFDB-5451 NT is crosslinked with DFDA-5488 NT, and optionally, DFDB-5410 BK, it should meet 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 ¹	2400 psi	16.5 MPa	ASTM D638
Tensile Elongation ¹ (Break)	350 %	350 %	ASTM D638
Thermal	Nominal Value (English)	Nominal Value (SI)	Test Method
Hot Creep - 15 min, 20 N/cm ² ² (302°F (150°C))	< 100 %	< 100 %	ICEA T-28-562
Hot Set - 15 min, 0.2 MPa ² (392°F (200°C))	< 100 %	< 100 %	IEC 60811-2-1
Aging	Nominal Value (English)	Nominal Value (SI)	Test Method
Retention of Tensile Elongation - 7 days ¹ 250°F (121°C)	95 %	95 %	ASTM D638
Retention of Tensile Strength - 7 days ¹ 250°F (121°C)	90 %	90 %	ASTM D638

Additional Information

Storage:

- The environment or conditions of storage greatly influences the recommended storage time. Storage under extreme conditions may affect the quality, processing, or performance of the product. Storage should be in accordance with good manufacturing practices. The recommended storage conditions are dry conditions with temperatures between 50°F and 86°F (10°C and 30°C). When stored under these conditions, the product may be used by the customer for up to one year from the date of sale or two years from the date of manufacture, whichever comes first. It is recommended that the practice of using the product on a first-in / first-out basis be established.

Extrusion	Nominal Value (English)	Nominal Value (SI)
Drying Temperature	140 to 160 °F	60 to 71 °C
Drying Time	4.0 to 6.0 hr	4.0 to 6.0 hr
Melt Temperature	300 to 410 °F	149 to 210 °C

Extrusion Notes

DFDB-5451 NT will extrude with excellent surface quality and without extrusion scorch if the accompanying catalyst masterbatch, DFDA-5488 NT and the carbon black masterbatch, DFDB-5410 BK, are kept dry. It is especially recommended that the carbon masterbatch 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-410°F (150-210°C) have been successfully used.

After extrusion of the appropriate mixture of this product and its catalyst and carbon black masterbatches, crosslinking can be achieved by allowing moisture to diffuse into the product.

Fabricators can use a hot water bath, sauna or ambient conditions to promote curing following cable manufacture. To achieve a hot creep elongation of 100%, the typical times shown below are required (30 mil [0.76 mm] wall on 14 AWG [2.1 mm²] wire).

- 90°C sauna: 15 minutes
- 23°C, 70% rh: 1.5 days

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 (88.7% DFDB-5451 NT, 5% DFDA-5488 NT, and 6.3% DFDB-5410 BK)

² Measured on 14 AWG (2.1 mm²) wire with a 30 mil (0.76 mm) wall after 15 minutes curing in 90°C water.
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