



# SI-LINK™ DFDB-5400 NT

## Moisture Curable System, Flame Retardant Masterbatch

### Overview

SI-LINK™ DFDB-5400 NT is a RoHS (Reduction of Hazardous Substances)-compliant flame retardant masterbatch designed to be used in conjunction with SI-LINK™ DFDA-5451 NT Polyethylene and the catalyst masterbatch SI-LINK™ DFDB-5480 NT Polyethylene to form a flame retardant SI-LINK polyethylene insulation system. This system is bulletinized by UL as DFDB-5425 and is moisture curable. The specific gravity of the system is 1.04. It is recommended for use in low voltage power cable and industrial cable applications. SI-LINK™ DFDB-5400 NT is formulated to pass the UL-44 horizontal burn test on 14 AWG (1.63 mm) wire, 0.030 in. insulation wall thickness, at a 25% loading with 70% SI-LINK™ DFDA-5451 NT and 5% SI-LINK™ DFDB-5480 NT.

UV resistance allowing the wire to be printed "SunRes" may be achieved with the addition of a UV stabilizer package. The formulation for such an additive is available upon request and the resulting product is bulletinized by UL as DFDB-5425 UV. For accelerated curing applications SI-LINK™ DFDB-5400 NT can be used in conjunction with SI-LINK™ AC DFDB-5451 NT Polyethylene and the catalyst masterbatch SI-LINK™ AC DFDA-5488 NT Polyethylene to form a flame retardant SI-LINK™ AC polyethylene insulation system. This system is recognized by UL as DFDB-5425 AC. It is formulated to pass the UL-44 horizontal burn test on 14 AWG (1.63 mm) wire, 0.030" wall thickness, at a 25% loading with 70% SI-LINK™ DFDB-5451 NT and 5% SI-LINK™ AC DFDA-5488 NT.

### SPECIFICATIONS

The DFDB-5425 systems are bulletinized by UL for XHH, XHHW, XHHW-2, RHH, RHW, RHW-2, SIS, USE and USE-2. They are also suitable for CSA RW-90, and RWU-90 applications.

Physical	Nominal Value (English)	Nominal Value (SI)	Test Method
Density <sup>1</sup>	1.04 g/cm <sup>3</sup>	1.04 g/cm <sup>3</sup>	ASTM D792
Degree of Crosslinking	> 80 %	> 80 %	ASTM D2765A
Elastomers	Nominal Value (English)	Nominal Value (SI)	Test Method
Tensile Strength	290000 psi	2000 MPa	ASTM D412
Tensile Elongation (Break)	300 %	300 %	ASTM D412
Thermal	Nominal Value (English)	Nominal Value (SI)	Test Method
Hot Deformation (268°F (131°C))	< 20 %	< 20 %	UL 44
Hot Set - Elongation <sup>2</sup> (392°F (200°C))	< 50 %	< 50 %	IEC 60811-2-1
Aging	Nominal Value (English)	Nominal Value (SI)	Test Method
Change in Relative Permittivity			UL 44
1-14 days	2.0 %	2.0 %	
7-14 days	1.0 %	1.0 %	
Retention of Tensile Elongation - 7 days			ASTM D412
250°F (121°C)	80 %	80 %	
Retention of Tensile Strength - 7 days			ASTM D412
250°F (121°C)	80 %	80 %	
Electrical	Nominal Value (English)	Nominal Value (SI)	Test Method
Relative Permittivity <sup>3</sup>	3.00	3.00	UL 44
Capacitance <sup>4</sup>			UL 44
pf, 1 day : 194°F (90°C)	750	750	
pf, 14 days : 194°F (90°C)	750	750	
pf, 7 days : 194°F (90°C)	750	750	
Flammability	Nominal Value (English)	Nominal Value (SI)	Test Method
Oxygen Index	26 %	26 %	ASTM D2863
Flame Test - Horizontal <sup>5</sup>	Pass	Pass	UL 44
Additional Information	Nominal Value (English)	Nominal Value (SI)	Test Method
Crushing Test	1350 lbf	6005 N	UL 44
Flexibility - 4 hrs <sup>6</sup> (-13°F (-25°C))	No visible cracks	No visible cracks	UL 854

<b>Extrusion</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>
Drying Temperature	151 °F	66 °C
Drying Time	4.0 to 6.0 hr	4.0 to 6.0 hr
Cylinder Zone 1 Temp.	300 °F	149 °C
Cylinder Zone 3 Temp.	320 °F	160 °C
Cylinder Zone 5 Temp.	340 °F	171 °C
Melt Temperature	365 °F	185 °C
Head Temperature	340 °F	171 °C
Die Temperature	340 °F	171 °C

#### **Extrusion Notes**

The data below summarizes conditions for a commercial extrusion run of DFDB-5425 (DFDB-5400 NT /DFDA-5451/DFDB-5480, 25%/70%/5%). Using these conditions with a standard polyethylene screw afforded high quality finished wire.

Desiccant drying of the masterbatches at 150°F (66°C) for 4-6 hours is recommended. Wire pre-heat of 176-212°F (80-100°C) is recommended to obtain the typical physical properties for circuit size conductors. Adequate curing requires exposure for a minimum of 24-48 hours to 194°F (90°C) water or steam. Exact extrusion characteristics will of course be dependent on the equipment in use and can only be determined during cable trials.

#### Extruder

Screw L/D: 15:1 to 20:1

Screw Suggested: Single Flight

Compression Ratio: 2.5:1 to 3.5:1

Screen Pack: 20/40/60/20 Mesh

#### **Notes**

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

<sup>1</sup> 23°C

<sup>2</sup> 15 min, 20N/cm<sup>2</sup>

<sup>3</sup> 1 day

These tests were conducted on #14 AWG solid wires insulated with 0.030 in. wall thickness insulation.

<sup>4</sup> These tests were conducted on #14 AWG solid wires insulated with 0.030 in. wall thickness insulation.

<sup>5</sup> No. 14 AWG 30 mil wall

These tests were conducted on #14 AWG solid wires insulated with 0.030 in. wall thickness insulation.

<sup>6</sup> This test was conducted on # 4 AWG stranded wire insulated with 0.060 in. wall thickness insulation.

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