

DOW™ Electrical & Telecommunications

DFDA-1648 NT EXP1

Non-Halogen, Flame Retardant, Thermoplastic Jacket Compound
The Dow Chemical Company

Message:

DFDA-1648 NT EXP1 is a thermoplastic, non-halogen, flame retardant jacketing compound. It is designed for general purpose cable jacket applications.

Features

DFDA-1648 NT EXP1 provides the following features:

Processing and cabling attributes

Ease of extrusion, without the need for special screws

Good anti-scratch whitening

Good surface appearance (shining and smoothness)

Good crack resistant on majority of armored cables

Excellent combustion properties (lower smoke, lower acidity)

Excellent electricals

High volume resistivity (could be used as 0.6/1 kV insulation in dry conditions)

Low dielectric constant and dissipation factor

Competitive mechanical properties (tensile elongation, tear strength, abrasion resistance, flexibility)

Good thermal properties (low temperature performance, good hot deformation)

Environmentally friendly (lead-free, halogen free, sulfur/antimony-free)

Colorable with EVA based color concentrates

Specifications

For many cable designs, DFDA-1648 NT EXP1 will meet UL-1685, IEEE-383, CSA FT-4, IEC-60332-3C vertical tray cable burn tests, and IEC-61034 smoke generation tests

General Information			
Uses	Flame Retardant Jacketing		
	Industrial Cable Jacketing		
	LSZH Jacketing		
	Wire and cable applications		
	Communication wire sheath		
Agency Ratings	CSA FT-4		
	IEC 60332-3		
	IEEE 383		
	UL 1685		
Physical	Nominal Value	Unit	Test Method
Specific Gravity	1.45	g/cm ³	ASTM D792
Hardness	Nominal Value	Unit	Test Method
Durometer Hardness			ASTM D2240
Shaw A	93		ASTM D2240
Shaw D	46		ASTM D2240
Mechanical	Nominal Value	Unit	Test Method
Tensile Strength	11.7	MPa	ASTM D638

Tensile Elongation (Break)	250	%	ASTM D638
Elastomers	Nominal Value	Unit	Test Method
Tear Strength	8.00	kN/m	ASTM D470
Aging	Nominal Value	Unit	Test Method
Tensile strength retention-7 days(121°C)	100	%	ASTM D638
Elongation retention rate-7 days(121°C)	80	%	ASTM D638
Thermal deformation			UL 1581
90°C	1.3	%	UL 1581
100°C	2.7	%	UL 1581
121°C	87	%	UL 1581
Oxygen sensing time-Al pans, no screen, 60 ml oxygen/min(220°C)	32	min	ASTM D3895
Toxicity	1.90		NES 713
Acid gas emission pH	5.30		IEC 754-2
Acid gas emission conductivity	0.630	μS/mm	IEC 754-2
Temperature index (combustion)-Critical	> 300	°C	NES 715
Smoke (2.54mm)	23.0		NES 711
Smoke Density			ASTM E662
Flaming Mode - D1.5 : 508.0 μm	1.4		ASTM E662
Flaming Mode - D1.5 : 2.54 mm	1.5		ASTM E662
Flaming Mode - D4.0 : 508.0 μm	9.1		ASTM E662
Flaming Mode - D4.0 : 2.54 mm	2.5		ASTM E662
Flaming Mode - Dm, (corr.) : 508.0 μm	22		ASTM E662
Flaming Mode - Dm, (corr.) : 2.54 mm	110		ASTM E662
Non-flaming Mode - D1.5 : 508.0 μm	6.9		ASTM E662
Non-flaming Mode - D1.5 : 2.54 mm	0.040		ASTM E662
Non-flaming Mode - D4.0 : 508.0 μm	55		ASTM E662
Non-flaming Mode - D4.0 : 2.54 mm	28		ASTM E662
Non-flaming Mode - Dm, (corr.) : 508.0 μm	130		ASTM E662
Non-flaming Mode - Dm, (corr.) : 2.54 mm	330		ASTM E662
Thermal	Nominal Value	Unit	Test Method
Brittleness Temperature	-40.0	°C	ASTM D746
Electrical	Nominal Value	Unit	Test Method
Volume Resistivity (23°C)	2.1E+14	ohms · cm	ASTM D257
Dielectric Constant			ASTM D150
60 Hz	3.80		ASTM D150
100 kHz	3.43		ASTM D150
1 MHz	3.50		ASTM D150
Dissipation Factor			ASTM D150
60 Hz	0.034		ASTM D150
100 kHz	7.0E-3		ASTM D150

1 MHz	9.0E-3		ASTM D150
Flammability	Nominal Value	Unit	Test Method
Oxygen Index	39	%	ASTM D2863
Additional Information			

Fluid Resistance:

Oil , IRM #902, 7 days, 23°C

Tensile Strength Retention: 87.6%

Elongation Retention: 89.8%

Oil , IRM #902, 4 hrs, 70°C

Tensile Strength Retention: 75.9%

Elongation Retention: 86.1%

Turbine Fuel, JP-5, MIL-T-5624, 24 hrs, 23°C

Tensile Strength Retention: 63.8%

Elongation Retention: 74.1%

Extrusion instructions

DFDA-1648 NT EXP1 can be processed on commercial thermoplastic extrusion equipment. Processing practices necessary to achieve optimum characteristics will be dependent on the particular equipment used and can be determined only by extrusion trials. Typical Extrusion Conditions
Typical commercial extrusion conditions are shown below as a guide. Each extrusion system is unique and will require optimization of these conditions for the specific unit.

EXTRUDER

Screw L/D: 20:1 to 24:1

Screw Type: Single Flight

Compression Ratio: 2:1 to 3:1

Screenpack: 12 or 20 mesh

Draw-Down Ratio (DDR for semi pressure or tube on): Up to 3.5

TEMPERATURE PROFILE

BARREL:

Feed Zone: 266°F (130°C)

Center Zones: 284°F (140°C)

Metering Zone: 293°F (145°C)

CROSSHEAD:

Head: 320°F (160°C)

Die: 320°F (160°C)

Melt Temperature: < 338°F (170°C)

SCREW:

Circulating Water: Neutral

Compound Drying

Drying before extrusion in a dehumidifying hot air dryer for a minimum of 6 hours at 140°F (60°C) is recommended to avoid jacket porosity and to improve the extrusion quality. Do not heat over 195°F (90°C).

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