UNIGARD™ RE DFDE-1638 NT

Non-Halogen, Flame Retardant, Thermoplastic Jacket Compound

The Dow Chemical Company

Message:

UNIGARD™RE DFDE-1638 Natural is a halogen-free material with high flame retardancy, thermoplastic, low smoke, low corrosion and low toxicity. This product is a universal cable sheath material. As a sheath material, the product has passed the IEEE-383/UL-1581/UL-1685 [Limited Smoke Production Test] Vertical Bracket Cable Burning Test. Of course, cable structure plays an important role in flame retardant performance. The product can be used as a cable sheath, and the working temperature can be as high as 90°C.
This product can replace PVC, low-smoke PVC and halogen-containing rubber as sheath materials. It has excellent fire safety (low smoke, low corrosion and low toxicity) and good performance balance. This product can meet or exceed many industry specifications for sheath materials, such as UL-1277 bracket cables.
As a halogen-free flame retardant sheath material, UNIGARD™RE DFDE-1638 Natural can also be used to replace ordinary non-halogen sheath products. Compared with the existing non-halogen sheath products, the extrusion temperature of this product is as high as 180°C, and the common single spiral metering PE screw can be used for extrusion processing.
Main features:
high flame retardant level
Environmental protection (lead-free, halogen-free, sulfur-free/antimony-free)
low smoke, low corrosiveness and low toxicity
Easy extrusion without special screw
Has a good balance between toughness and flexibility

General Information			
Uses	Flame Retardant Jacketing Industrial Cable Jacketing LSZH Jacketing Wire and cable applications Communication wire sheath		
Agency Ratings	IEEE 383 UL 1277 UL 1581 UL 1685		
Forms	Particle		
Physical	**Nominal Value**	**Unit**	**Test Method**
Density [1]	1.48	g/cm³	ASTM D1505
Environmental Stress-Cracking Resistance [2] (10% Igepal, F0)	720	hr	ASTM D1693
Hardness	**Nominal Value**	**Unit**	**Test Method**
Durometer Hardness (Shore A)	96		ASTM D2240
Mechanical	**Nominal Value**	**Unit**	**Test Method**
Tensile Strength	14.7	MPa	ASTM D638
Tensile Elongation (Break)	150	%	ASTM D638
Flexural Modulus - 1% Secant	138	MPa	ASTM D790
Elastomers	**Nominal Value**	**Unit**	**Test Method**

Tear Strength	6.13	kN/m	ASTM D470
Aging	**Nominal Value**	**Unit**	**Test Method**
Tensile strength retention rate			ASTM D638
10 days : 110°C	110	%	ASTM D638
7 days : 121°C	110	%	ASTM D638
Elongation retention rate			ASTM D638
10 days : 110°C	78	%	ASTM D638
7 days : 121°C	80	%	ASTM D638
Thermal deformation			UL 1581
90°C	4.0	%	UL 1581
100°C	4.0	%	UL 1581
121°C	20	%	UL 1581
Acid Gas Test - Acid by Weight		%	MIL C-24643
Toxicity	0.900		NES 713
Acid gas emission pH	4.40		IEC 60754-2
Acid gas emission conductivity	29.0	µS/cm	IEC 60754-2
Temperature index (combustion)-Critical [3]	> 300	°C	NES 715
Smoke	13.7		NES 711
Smoke Density			ASTM E662
Flaming Mode - D1.5 : 2.54 mm [4]	0.40		ASTM E662
Flaming Mode - D4.0 : 2.54 mm [5]	51		ASTM E662
Flaming Mode - Dm, (corr.) : 2.54 mm [6]	320		ASTM E662
Non-flaming Mode - D1.5 : 2.54 mm [7]	0.10		ASTM E662
Non-flaming Mode - D4.0 : 2.54 mm [8]	12		ASTM E662
Non-flaming Mode - Dm, (corr.) : 2.54 mm [9]	190		ASTM E662
Resistance to sunlight-720 hours	Pass		UL 1581
Thermal	**Nominal Value**	**Unit**	**Test Method**
Brittleness Temperature	-24.0	°C	ASTM D746
Electrical	**Nominal Value**	**Unit**	**Test Method**
Volume Resistivity (23°C)	1.9E+15	ohms·cm	ASTM D257
Dielectric Constant (60 Hz)	3.90		ASTM D1531
Dissipation Factor (60 Hz)	0.013		ASTM D1531
Flammability	**Nominal Value**	**Unit**	**Test Method**
Oxygen Index	35	%	ASTM D2863
Additional Information	**Nominal Value**		**Test Method**

UNIGARD™ RE DFDE-1638 Natural 适用于需要由制造商验证流体阻力的应用中,并且可能和 DFDA-1638 Natural 或 DFDC-1638 Black 过去的体验不同.需要时,Dow 可提供 UNIGARD™ RE DFDE-1638 Natural 是否符合特定流体阻力要求的咨询.但是,制造商需要确保他们所制造电缆的性能符合法规/标准要求.

Extrusion instructions

Typical extrusion conditions are listed below. Exact conditions will depend upon the equipment used and the application.Extruder
Screw L/D: 24:1; 4 ½ in. diameter
Screw Suggested: Straight PE screw
Compression Ratio: Range of 2.0:1 to 3.0:1
Screen Pack: 20-mesh screen
Pre-Drying
Dow recommends drying UNIGARD™ RE DFDE-1638 Natural in a desiccant dryer for a minimum of 4 hours at 140°F (60°C). Do not go above 150°F (65°C).
Extrusion Temperatures
The following temperature profile was used successfully in a 4 1/2 in. diameter, 24:1 L/D extruder. We recommend that you use it as a starting point. It may be necessary to optimize it for your given extruder and cable construction.
Barrel Feed Zone: 360° F
Barrel Transition Zone: 350° F
Barrel Metering Zone: 340° F
Crosshead Zone: 330° F
Actual Melt Temperature: <380°F
The following flat temperature profile could also be used: 350°F to 380°F.
Actual Melt Temperature: <380°F
For Customers familiar with processing DFDA-1638 Natural, the power draw and extruder pressure will be higher for UNIGARD™ RE DFDE-1638 Natural due to higher viscosity. Attempting to run at melt temperatures above 380°F can lead to foaming.
Tooling
Tube-on and semi-pressure tooling will work. A short land die is preferred.
Air Gap/Cooling water
A short air gap (~ 6 in.) and ambient water are recommended.
Coloring
UNIGARD™ RE DFDE-1638 Natural is a colorable compound. Color masterbatch materials based on EVA copolymers and added at a 1-2 percent by weight level gives adequate color and disperses well in the extrusion process.

NOTE	
1.	23°C
2.	No crack
3.	Key
4.	Combustion mode,-D1.5
5.	Combustion mode,-D4.0
6.	Combustion mode,-Dm,(corrected)
7.	Non-combustion mode,-D1.5
8.	Non-combustion mode,-D4.0
9.	Non-combustion mode,-Dm,(corrected)

Recommended distributors for this material

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WECHAT