UNIGARD™ HP HFDA-6522 NT

Halogenated Flame Retardant Insulation Compound

The Dow Chemical Company

Message:

CV Cure/Control Cable Insulation (UL 44 VW-1)

General Information			
Uses	Flame Retardant Insulation Halogenated Insulation Low voltage insulation Wire and cable applications Insulating material Moisture-resistant insulating material		
Forms	Particle		
Physical	**Nominal Value**	**Unit**	**Test Method**
Density	1.30	g/cm³	ASTM D1505
Mechanical Water Absorption (82°C)	0.190	mg/cm²	UL 1581
Tensile strength retention-7 days(121°C)	100	%	ASTM D638
Elongation retention rate-7 days(121°C)	95	%	ASTM D638
Deformation (121°C)	10	%	UL 44
SIC			UL 44
in 75°C (167°F) water, after 24 hrs	3.23		UL 44
in 75°C (167°F) water, increase, 1 to 14 days	2.0	%	UL 44
in 75°C (167°F) water, increase, 7 to 14 days	0.10	%	UL 44
Stability Factor	0.300		UL 44
Insulation resistance-in water(16°C)	50000	Mohms/1000 ft	UL 44
VW-1 - Vertical Burn Test (No. 14 AWG (1.63 mm dia.) XHHW, RHH)	Pass		UL 44
Flame test-Horizontal	Pass		UL 44
Mechanical	**Nominal Value**	**Unit**	**Test Method**
Tensile Strength	13.8	MPa	ASTM D638
Tensile Elongation (Break)	330	%	ASTM D638
Flexural Modulus - 1% Secant	124	MPa	ASTM D790
Electrical	**Nominal Value**	**Unit**	**Test Method**
Dielectric Constant (60 Hz)	3.20		ASTM D150
Dissipation Factor (60 Hz)	3.0E-3		ASTM D150
Flammability	**Nominal Value**	**Unit**	**Test Method**
Oxygen Index	29	%	ASTM D2863

Additional Information

Heat Aging Characteristics

HFDA-6522 Natural is formulated to possess an outstanding long-term service life. Results supporting this very important wire and cable compound property are presented graphically in Figure 1.

Arrhenius aging data represent the accepted method for projecting service life of wire and cable compounds. The data in Figure 1 are presented in terms of the time required at various temperatures to reach 60 percent of the original elongation measured. These data were obtained on cured slab samples subjected to oven aging at temperatures of 136, 146, 156, 170 and 182°C. The semi-log curve data in Figure 1 show an excellent correlation coefficient (0.94) and were used to project a service life at 85°C of 40 years.

Your attention is drawn to a not uncommon initial change in percent elongation found with UNIGARD-HP HFDA-6522 Natural. We have determined that oftentimes an initial decrease in the elongation to about 85 percent of the original is measured. This change does not reflect oxidative degradation of the compound but rather signals a post-cure interactive effect of one of the formulation components. Once this post-cure phenomenon is complete, further accelerated loss of elongation does not occur. The post-cure decrease is not at all significant because HFDA-6522 Natural possesses an extremely high original percent elongation value.

Wet Electrical Performance

Figures 2 and 3 graphically present insulation resistance and specific inductance capacitance data for HFDA-6522 Natural in 75°C water for one year. These data show the excellent long-term dielectric properties of this compound under these test conditions.

Figures 4 and 5 present the same data measured under the more severe continuous service conditioning in 90°C water. Again the excellent results reflect the retention of insulative properties in the demanding environment of the test.

Colorability

HFDA-6522 Natural is a colorable compound. Our experience has been that the color masterbatch materials recommended for use with crosslinked polyethylene wire and cable products serve the purpose in HFDA-6522. Generally speaking, color masterbatch added at the 2% by weight level gives adequate color and disperses well in the extrusion process.

Figure 5: EM-60 Data HFDA-6522 Specific Inductance Capacitance in 90°C water

Extrusion instructions

The Extrusion Profile summarizes conditions for a commercial extrusion run on HFDA-6522. Using these conditions with a standard polyethylene screw afforded high quality finished wire meeting the specifications set forth in Underwriters Laboratories, Subject 44 and 854 (XHHW, SIS, USE, A, B, or C applications and VW-1). Exact extrusion characteristics will, of course, be dependent on the equipment in use and can be determined only during cable trials.Hopper drying at 150°F (65°C) before extrusion is recommended to remove moisture and diminish the possibility of die drool. DRYING TIME 4-6 HRS.Extrusion Profile

Compound: HFDA-6522 on #14 7/STR (1.84 mm) Bare Copper, .030 in, 3 1/2 in Extruder

Head: 235°F (113 °C)

Die: 180°F (82°C)

Zones: 235, 235, 235, 240, 250°F (113, 113, 113, 115, 121°C)

Screw: 180°F (82°C)

Stock: 245°F (118 °C)

Speed: 300 FPM (30 sec. steam leg residence time)

Recommended distributors for this material

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WECHAT