



# TT103FR

## High Density Flame Retardant Insulation Compound

### Description

TT 103FR is a halogenated fire resistant high density polyolefin compound which offers an excellent balance of flame retardancy, processability, electrical and physical properties. TT 103FR is designed to reduce flame spread and achieve a VW-1 flame resistant rating on 14 AWG wires and larger. It also offers good extrusion processing characteristics on either conventional polyethylene or PVC extrusion lines. In addition, TT 103FR contains a UV stabilization additive package that provides effective long-term UV weather resistance. TT 103FR is readily pigmented to a variety of colors using standard wire and cable color concentrates designed for polyolefins.

### Applications and Uses

TT 103FR can be used as an insulating material for data grade multi-pair and solid coaxial cable constructions. TT 103FR can be used in certain cable designs to meet UL 1581, UL 444, CSA FT-4, UL 1666 specifications and IEEE 383 and CSA C22.2 No. 3 requirements for vertical flame tests.

TT 103FR complies with "Restriction of Hazardous Substances" Directive, Citation 2002-95-EC, commonly known as RoHS without exemption and does not contain decabromodiphenyl oxide. TT 103FR provides good resistance to abrasion, impact and crush.

Physical Properties	Typical Value <sup>(2) (4)</sup>	Unit	Test Method <sup>(1)</sup>
Specific Gravity	1.34		ASTM D 792
Tensile Strength	3,000	psi	ASTM D 412
Elongation	500	%	ASTM D 412
Crush Resistance	620 (280)	psi (kg)	UL 1581
Heat Aging 7 days @ 121°C			
Retained Tensile	>=90	%	ASTM D 412
Retained Elongation	>=85	%	ASTM D 412
Melt Flow Rate (190°C, 2.16 kgs)	0.40	g/10 min	ASTM D 1238
Limiting Oxygen Index	29	%	ASTM D 2863
Flammability (.063")	V-0	-	UL 94

Electrical Properties	Typical Value <sup>(2) (3)</sup>	Unit	August 2017
			Test Method <sup>(1)</sup>
Dielectric Constant (60 Hz)	2.40	-	ASTM D 150
Dissipation Factor (60 Hz)	0.0027		ASTM D 150
Dielectric Strength	660		ASTM D 149
Volume Resistivity	1.6 x 10 <sup>16</sup>		ASTM D 257

- (1) Tested in accordance with the latest issue of the designated test methods.
- (2) Data represents typical values and should not be used for specification work.
- (3) All electrical properties tested on a .075-inch-thick plaque.
- (4) All physical properties tested on a .030-inch-thick extruded tape.

Suggested Extrusion Equipment		Suggested Extrusion Conditions	
Extruder L/D:	20:1 (minimum)	Throat:	Water Cooled
Extruder L/D:	24:1 (preferred)	Zone 1:	370°F (190°C)
Screw:	Single Flight	Zone 2:	385°F (196°C)
		Zone 3:	390°F (199°C)
Compression Ratio:	2.7 to 3.5:1	Zone 4:	390°F (199°C)
		Head/Die:	390°F (199°C)
Die:	Smooth Transition With >= 1/8-inch land Die & Tip include angle: 22-35°		

### General Processing Guidelines

A suggested melt temperature of 390°F (199°C) should provide a good quality product. On startup and shut downs, material should be kept moving slowly through the barrel. If the material remains in the extruder for more than 5 minutes at temperatures > 430°F (221°C), it may decompose. Ventilation at the extruder is recommended. It is suggested to purge the barrel with a thermoplastic resin if necessary to turn off the extruder for more than a few minutes. Exposure of these materials to elevated temperatures for prolonged periods of time may also decrease long term stability.

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