TPE 5595CR

Flame Retardant Thermoplastic Elastomer (TPE) Compound for Appliance Wire and FR Insulation and Jacketing Applications

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Description

TPE 5595CR is a natural, olefin-based thermoplastic elastomer (TPE) intended for wire and cable insulation and jacketing applications where high temperature performance and excellent flame resistance are required. **TPE 5595CR** complies with "Restriction of Hazardous Substances" Directive, Citation 2002-95-EC, commonly known as RoHS without exemption. **TPE 5595CR** does not contain decabromodiphenyl oxide. **TPE 5595CR** exhibits excellent wet and dry electrical properties and superior chemical resistance. It also provides good resistance to abrasion, impact and crush. **TPE 5595CR** also exhibits superior low temperature properties as demonstrated by it passing cold bend and impact testing at -50°C.

TPE 5595CR contains a halogen-based, flame retardant additive package designed to reduce normal PE flame spread characteristics 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, **TPE 5595CR** contains a UV stabilization additive package that provides effective long-term UV weather resistance.

TPE 5595CR is readily pigmented to a variety of colors using standard wire and cable color concentrates designed for thermoplastic or crosslinked polyolefins.

Application

TPE 5595CR is intended for 125°C UL rated appliance wire and other flame retardant insulation or jacketing constructions. Specifically, this product is rated a V-0 by UL Standard 94 at a minimum thickness of 0.062 inches. **TPE 5595CR** is capable of achieving a VW-1 flame resistance on 14 AWG or larger conductors as per UL Standard 1581.

Specifications

Cables manufactured using **TPE 5595CR** in accordance with standard industry practices should meet the following industry cable specifications:

- Underwriters Laboratories Standard 62 Class 1.14 and 1.18 for Jacketing
- Underwriters Laboratories Standard 62 Class 2.20 and 2.28 for Insulation
- Underwriters Laboratories Standard 62 Class 36 Insulation and Jacketing
- Underwriters Laboratories Standard 94 V-0
- Underwriters Laboratories Standard 758 Style 1722 Appliance Wire

General Processing Guidelines

Extrusion start-up and shut-down procedures are similar to those of polyethylene. Since these materials are non-corrosive or abrasive, no special recommendations are made for barrel and screw materials of construction. A suggested melt temperature of 410ºF (210ºC) should provide a good quality product. Exposure of these materials to elevated temperatures >450ºF (230ºC) for prolonged periods of time has been shown to decrease long-term stability. Preheating the conductor to 125-150ºC is recommended during insulation extrusion to minimize orientation and internal stress that could result in poorer physical properties.

Physical Properties	**Typical Value** (2)(4)	**Unit**	**Test Method** (1)
Density	1.34	g / cm^3	ASTM D 792
Tensile Strength	2900 (20)	psi (Mpa)	ASTM D 412
Ultimate Elongation	600	%	ASTM D 412
Flexural Modulus	52,000 (360)	psi (Mpa)	ASTM D 790
Heat Aging, 7 days at 136°C			UL 1581
Tensile Strength Retention	>= 90	%	ASTM D 412
Ultimate Elongation Retention	>= 90	%	ASTM D 412
Durometer Hardness, Shore D	41	-	ASTM D 2240
Durometer Hardness, Shore A	93	-	ASTM D 2240
Brittleness Temperature	< -50 (< -45)	°F (°C)	ASTM D 746
Limiting Oxygen Index	28	%	ASTM D 2863
Flammability	V-0	-	UL 94

Electrical Properties	**Typical Value** (2)(3)	**Unit**	**Test Method** (1)
Dielectric Constant (60 Hz)	2.40	-	ASTM D 150
Dissipation Factor (60 Hz)	0.0027	-	ASTM D 150
Dielectric Strength	660	V / mil	ASTM D 149
Volume Resistivity	1.6 x 10^{16}	Ω cm	ASTM D 257

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:	Barrier or Single Flight	Zone 2:	390°F (200°C)
Compression Ratio:	2.7 to 3.5:1	Zone 3:	400°F (205°C)
Die:	Smooth transition,	Zone 4:	410°F (210°C)
	With >= 1/8 in. land	Head / Die:	410-450°F (210-230°C)
	Die & Tip include angle: 22-35°		

(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 0.075 inch thick molded plaque.
(4) All physical properties tested on a 0.030 inch thick extruded tape.

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