3M™ Heavy Wall Heat Shrink Tubing ITCSN

Data Sheet **November 2018**

Description	3M™ Heavy Wall Heat Shrink Tubing ITCSN is designed to provide reliable performance for electrical splices, connections, and terminations, as well as mechanical and weather resistant protection. This tubing is fabricated from cross-linked polyolefin. The tubing is highly split-resistant and fast-shrinking to provide rapid installation. It comes standard with a factory-applied adhesive/sealant.
Agency Approvals & Self Certifications	UL Listed, UL 486D Standard, File E102356 CSA Certification, File LR86335 Voltage Rating 600 V Direct burial and Submersible For use with Listed, Crimp-type, Splice Connectors All other product claims are made by 3M and not covered by the UL Listing For RoHS and REACH information, please visit www.3M.com/regs
Features	• Fast and easy installation • Thick wall top resists puncture and abrasion damage • Rugged weather resistant protection • Versatile, a minimum number of sizes cover the entire range of applications • Shrink ratio as high as 4:1 • Resists acids and alkalies • Bonds to a wide variety of substrates • Reliable and proven • UV resistant
Applications	• Primary electrical insulation for solid dielectric wire and cable rated to 1000 volts • For indoor, outdoor or overhead use • Direct buried or submersible • Insulating secondary splices • Physical protection and moisture sealing of high voltage air insulated connectors and lugs, such as lug connections to bus bars • Relocation of service • Dig-in repairs • Sheath repairs



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Standard Sizes and Dimensions

Product Number	Cable Range Size	Minimum Expanded/ Maximum Recovered I.D.	Cable O.D. Use Range Maximum - Minimum	Certification and Listings
	in. (mm)	in. (mm)	in. (mm)	
ITCSN-0400	12 - 6 AWG (4 - 10 mm^2)	0.40 / 0.15" (10,2 / 3,8mm)	0.35 – 0.17" (9 - 3,3 mm)	E102356 LR86335
ITCSN-0800	8 - 1/0 AWG (10 - 15 mm^2)	0.80 / 0.20" (20,3 / 5,1 mm)	0.65 – 0.24" (18 - 5,6 mm)	E102356 LR86335
ITCSN-1100	2 - 4/0 AWG (35 - 95 mm^2)	1.10 / 0.37" (27,9 / 9,4 mm)	0.88 – 0.40" (24 - 9,4 mm)	E102356 LR86335
ITCSN-1500	3/0 AWG – 400 kcmil (95 -185 mm^2)	1.50 / 0.50" (38,1 / 12,7 mm)	1.19 – 0.60" (33 - 12,1 mm)	E102356 LR86335
ITCSN-2000	250 – 750 kcmil (150 - 300 mm^2)	2.00 / 0.65" (50,8 / 16,5 mm)	1.60 – 0.75" (44 - 19,0 mm)	E102356 LR86335
ITCSN-3000	600 – 1250 kcmil (400 - 625 mm^2)	3.00 / 1.00" (76,2 / 25,4 mm)	2.25 – 1.20" (63,5 - 25,4 mm)	LR86335
ITCSN-4500	1500 – 2500 kcmil (800 - [illegible] mm^2)	4.50 / 1.50" (114,3 / 38,1 mm)	4.00 – 1.50" (101,6 - 38,1 mm)	
ITCSN-6000	2.1 – 4.8" (53 - 122 mm^2)	6.00 / 1.80" (152,4 / 45,7 mm)	5.50 – 1.80" (139,7 - 45,7 mm)	

Typical Properties

Not for specifications. Values are typical, not to be considered minimum or maximum. Properties measured at room temperature 73°F (23°C) unless otherwise stated.

Physical Property (Test Method)	**Typical Value** US units (metric)
Color	Black
Ultimate Tensile Strength (ASTM D412)	2400 PSI (16 Mpa)
Ultimate Elongation	475%
Longitudinal Change	+1, -10%
Secant Modulus (2%) (ASTM D882A)	14,000 PSI (98 Mpa)
Shore D Hardness (ASTM D-2240)	42
Air-Oven Aging [7 days @ 175°F (175°C)] Tensile Strength Elongation	 2,680 psi (18 Mpa) 375%
Heat shock (outer wall only) 4 hrs @ 491°F (255 °C)	No dripping, flowing, cracking
Low Temperature Flexibility 4 hrs @ -67°F (-55°C)	No cracking
Specific Gravity (ASTM D792 A-1)	1.28
Continuous Operating Temperature (less adhesive)	-67°F-230°F (-55°C-110°C)

Electrical Property	**Typical Value** US units (metric)
Dielectric Strength (60 mils) (ASTM 149)	500 V/mil
Volume Resistivity (ASTM D257)	1 x 10^{14} ohm/cm

Chemical Property	**Typical Value** US units (metric)
Corrosivity (Mil-I-23053/15)	Non-corrosive
Fungus Resistance (ASTM G-21)	Non-nutrient
Water Absorption (ASTM D-570 6.1)	0.05%
Fluid Resistance JR4 Skydrol 600 Solution Gasoline Hydraulic Fluid	 >1500 PSI @ V/mil @ 600 V/mil

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Product Selection

Selecting 3M™ Heavy Wall Heat Shrink Tubing ITCSN is easy and straightforward. The largest tubing size that provides a tight fit when fully recovered will produce the maximum wall thickness. Final wall thickness is proportional to the degree of tubing recovery.

Listed Catalogue Number	Wire Size
ITCSN-0400	12 - 6
ITCSN-0800	8 - 1/0
ITCSN-1100	2 - 4/0
ITCSN-1500	3/0 - 400
ITCSN-2000	250 - 750

Specifications

The heat shrink tubing must be chemically cross-linked, thermally stabilized polyolefin, capable of operation at cable emergency overload temperatures of 266°F (130°C). The tubing must have UL Listing (UL 486D, 600V) and be approved for the use and be CSA Certified. Supplied tubing lengths of 4 feet and less shall be adhesive lined. The minimum shrink temperature shall be 250°F (121°C).

Engineering/ Architectural Specifications

The tubing must be usable in both indoor and outdoor applications on cables rated up to 1000 volts. It is resistant to moisture, mild acids and alkalies, fuels, oils, ozone, or ultraviolet light. It is compatible with and adheres to most types of cable jackets, including rubber, plastic or lead.

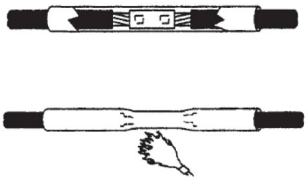
Performance Tests

UL 486D – The 3M ITCSN tubing was subjected to the requirements of UL 486D and passed all tests. This tubing is UL Listed per UL 486D and CSA Certified.

Installation Techniques

A detailed instruction sheet regarding proper installation is included in each kit. A brief summary of the installation steps is outlined as follows:

1. Thoroughly clean and prepare cable
2. Slide 3M ITCSN tubing onto cable
3. Install connector, if applicable
4. Center tubing



5. Shrink tubing from center
6. Heat until tubing is completely shrunk and adhesive/sealant (if applicable) is squeezed from ends

Shelf Life & Storage	3M™ Heavy Wall Heat Shrink Tubing ITCSN has a 10-year shelf life from date of manufacture when stored in a humidity controlled storage (10°C/50°F to 27°C/80°F and <75% relative humidity).
Availability	Please contact your local distributor, available from 3M.com/oem [Where to Buy] or call 1.800.676.8381

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