

**3M****ITCSN**

# Heavy Wall Heat Shrink Tubing

## Data Sheet



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LISTED  
 98U1  
 Wire connector  
 system for use  
 with underground  
 connectors



LR 86335

### Product Description

3M™ ITCSN Heat Shrink Tubing is designed to provide reliable performance for electrical splices, connections, and terminations, as well as mechanical and environmental protection. ITCSN is fabricated from cross-linked polyolefin. The tubing is highly split resistant, and fast shrinking to provide rapid installation. The tubing comes standard with a factory-applied adhesive/sealant.

### Product Features

- Fast and easy installation
- Thick walls to resist puncture and abrasion damage
- Complete environmental protection
- Versatile, a minimum number of sizes cover the entire range of applications
- Shrink ratio as high as 4:1
- Resists acids and alkalis
- 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
- Shrink ratio as high as 4:1
- 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

### Product Selection

Selecting ITCSN tubing 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.

Physical and Electrical Typical Properties	
Property and Test Method	Typical Value*
Continuous Operating Temperature (less adhesive)	-55°C to 110°C
Color	Black
Shore D Hardness (ASTM D-2240)	42
Low Temperature Flexibility (4 hours @ -55°C)	No Cracking
Heat Shock (4 hours @ 255°C)	No Cracking, Flowing or Dripping
2% Secant Modulus (ASTM D-882 A)	14,000psi (98MPa)
Specific Gravity (ASTM D-792 A-1)	1.28
Water Absorption (ASTM D-570 6.1)	0.05%
Ultimate Elongation	475%
Longitudinal Change	+1, -10%
Dielectric Strength (60 mils) (ATSM D-149)	500 v/mil
Volume Resistivity (ATSM D-257)	1 x 10 <sup>14</sup> ohm cm
Fungus Resistance (ATSM G-21)	Non-nutrient
Corrosivity (Mil-I-23053/15)	Non-corrosive
Air-Oven Aging (7days@ 175°C)	
-Tensile Strength	2,680 psi (18 MPa)
-Elongation	375%
Ultimate Tensile Strength (ASTM D-412)	2400 psi (16 MPa)

\*All values are averages, based on several determinations, and are not intended for specification purposes.

### Engineering/Architectural Specifications

The tubing must be usable both indoors and outdoors, in overhead, direct-buried, or submerged applications on cables rated up to 1000 volts. It is not adversely affected by moisture, mild acids and alkalis, fuels, oils, ozone, or ultraviolet light. It must be compatible with and adhere to all types of cable jackets, including rubber, plastic or lead.

## Physical and Electrical Typical Properties

Product Number	Cable Size Range	Minimum Expanded/ Maximum Recovered I.D.		Cable O.D. Use Range Maximum - Minimum		Certification and Listings	
ITCSN-0400	12 - 6 AWG (4 - 10 mm <sup>2</sup> )	0.40 / 0.15"	10,2 / 3,8 mm	0.35 - 0.17"	9 - 3,3 mm	UL E102356	CS LR86335
ITCSN-0800	8 - 1/0 AWG (10 - 15 mm <sup>2</sup> )	0.80 / 0.20"	20,3 / 5,1 mm	0.65 - 0.24"	18 - 5,6 mm	UL E102356	CS LR86335
ITCSN-01100	2 - 4/0 AWG (35 - 95 mm <sup>2</sup> )	1.10 / 0.37"	27,9 / 9,4 mm	0.88 - 0.40"	24 - 9,4 mm	UL E102356	CS LR86335
ITCSN-1500	3/0 AWG - 400kcmil (95 - 185 mm <sup>2</sup> )	1.50 / 0.50"	38,1 / 12,7 mm	1.19 - 0.60"	33 - 12,1 mm	UL E102356	CS LR86335
ITCSN-2000	250 - 750kcmil (150 - 300 mm <sup>2</sup> )	2.00 / 0.65"	50,8 / 16,5 mm	1.60 - 0.75"	44,5 - 19,0 mm	UL E102356	CS LR86335
ITCSN-3000	600 - 1250kcmil (400 - 625 mm <sup>2</sup> )	3.00 / 1.00"	76,2 / 25,4 mm	2.25 - 1.20"	63,5 - 25,4 mm		CS LR86335
ITCSN-4500	1500 - 2500kcmil (800 - 1000 mm <sup>2</sup> )	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 <sup>2</sup> )	6.00 / 1.80"	152,4 / 45,7 mm	5.50 - 1.80"	139,7 - 45,7 mm		

### Product Specifications

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

### Performance Tests

**UL 486D** — ITCSN Tubing was subjected to the requirements of UL 486D and passed all tests. ITCSN is UL Listed per UL 486D. CSA Certified.

### Availability

3M™ ITCSN Heat Shrink Tubing is available from your electrical distributor.

### Maintenance

3M ITCSN Heat Shrink Tubing is not impaired by freezing or overheating due to ambient temperature found in storage or shipping. Normal storage and stock rotation is recommended.

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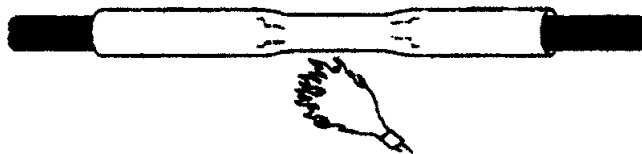
### Installation Techniques

Exact instructions are available on a separate sheet. The following is a summary of the instructions.

1. Thoroughly clean and prepare cable.
2. Slide 3M ITCSN 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.

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