Scotch® 77

Fire-Retardant Electric Arc Proofing Tape

1. Product Description

Scotch® Fire-Retardant Electric Arc Proofing Tape 77 Series are designed to protect most types of electrical cables from fault arc-generated heat and flames of nearby cable failures. These elastomeric tapes are formulated to generate a thick, insulating charred buildup when exposed to high temperatures. The insulating charred buildup protects wrapped cables and cable accessories from the fault arc-generated heat and flames of cable failures within approximately 20 inches until limiting devices can interrupt the faulted circuit.
Because Scotch® Fire-Retardant Electric Arc Proofing Tape 77 Series are elastomeric and unsupported, they are very conformable. Installers can provide virtually wrinkle-free coverage of cables and irregularly shaped cable accessories, easily and rapidly. This exceptional conformability provides better product control while wrapping and yields more uniform coverage. Also, the tape's thin cross section reduces the overall weight compared to other methods while providing arc protection. The white gray color of Scotch® Tape 77 White allows for easy identification of burned areas.
One half-lap wrap provides adequate protection for most installations. However, additional wraps can be applied, if conditions warrant, without requiring a reduction in conductor loads

Product features:

- Flexible unsupported elastomer makes it easy to apply and remove for cable inspection.
- Conformability provides virtually wrinkle-free wrapping and complete coverage with minimal effort.
- Provides fault arc protection to adjacent wrapped cables and cable accessories.
- Self-extinguishing; will not support combustion.
- Thin cross section 30 mils thickness saves space and allows cable heat to dissipated.
- Will last and maintain its arc proofing properties for the life of the cable. Resistant to water, salt water, acids, sewage and ultraviolet light.
- Can be removed and reused.
- Standard roll sizes for fast convenient installation.
- White-gray color of Scotch® Tape 77 White allows for the easy identification of fire damage areas.

2. Applications

- To arc proof high-energy power cables that may be exposed to arc-fault generated heat and flames from nearby failures of other high-energy cables (any cables within 20 inches are considered to be exposed)
- To arc proof control cable when high energy power cables are present
- To provide additional electrical insulation, thus reducing possibilities of transferred arcs.

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3. Typical Properties

Physical Properties	Typical Value	
Product Number	77 Black	77 White
Color	Black	White-Gray
Thickness	0,76 mm	
Elongation (% at break) 23°C -12°C -18°C	 150 % 130% 90%	
Breaking Strength	8,3 MPa	
Flame Resistant (UL 94 [Self-extinguishing])	V-O	
Oxygen Index (ASTM D-2863)	26 - 28 %	
Flame Test (Consolidated Edison EO 5343 Sec 3.2.6)	Pass	
Electrical & Thermal Properties	**Typical Value**	
Dielectric Strength	>10 kV	
Thermal Conductivity (23°C) ASTM C-518	0.15 BTU-ft (0,25 W/mk) ft^2-hr-°F	

Data are not for specifications. Values are typical and should not be considered minimum or maximum. Properties measured at room temperature ~23 °C unless otherwise stated.

Coverage Table

Cable O.D. mm (inches)	Tape Width mm (inches)	Number of 6 meter (20 foot) rolls needed to cover 30 meter (100 feet) of cable with one-half lap wrap (rolls)
25 mm (1”)	38 mm (1 ½”)	21
32 mm (1 ¼”)	38 mm (1 ½”)	27
38 mm (1 ½”)	38 mm (1 ½”)	32
44 mm (1 ¾”)	76 mm (3”)	19
51 mm (2”)	76 mm (3”)	20
57 mm (2 ¼”)	76 mm (3”)	24
64 mm (2 ½”)	76 mm (3”)	27
70 mm (2 ¾”)	76 mm (3”)	29
76 mm (3”)	76 mm (3”)	32
89 mm (3 ½”)	76 mm (3”)	37
102 mm (4”)	76 mm (3”)	42
114 mm (4 ½”)	76 mm (3”)	48

Use this formula to determine the quantity of Scotch® Tape 77 required to cover cables with a half-lap wrap:

C = Circumference (C = πD)
π = 3.14
D = Cable O.D. in Inches

LC = Length of Cable in Inches
W = width of Tape in Inches (minus ½ tape width)
LT = Length of Tape in Inches

$$\frac{(C)\,(LC)}{(LT)\,(W)} = \textbf{Number of Rolls Required}$$

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4. User Information

4.1 Specifications

Scotch® Electric Arc Proofing Tape 77 Series shall consist of a flexible, conformable, unsupported intumescent elastomer. The tape shall be 0.030 inches thick and be capable of over 100% elongation. The tape shall be non-corrosive to metallic cable sheaths and compatible with synthetic cable jackets (i.e. semiconducting URD type, polyethylene, PVC, etc.). It shall be self-extinguishing and shall not support combustion. The tape is resistant to water, salt water, gases, and sewage.

4.2 Engineering/Architectural Specification

High-energy cable, important communication and control cables in manholes, vaults, on open cable trays or other exposed locations where threat of fault can occur, shall be arc proofed with one half-lapped layer of Scotch® Fire-Retardant Electric Arc Proofing Tape 77 Black or 77 White.

4.3 Installation Technique

Wrap Scotch® Tape 77 Black or 77 White in half-lapped layers. The tape should be stretched slightly to obtain a snug, virtually wrinkle-free wrap which conforms to the cable. Overlap the last 6 inches of protected cable when starting a new roll of tape.
Since the Scotch® Tape 77 Series is not adhesive coated, it must be held in place after wrapping with bands of Scotch® Glass Cloth Electrical Tape 69. The most effective and economical way to hold either of these tapes in place is by banding (2 complete wraps) the first and last applied wrap

4.4 Shelf Life and Storage

This product has a 5-year shelf life from date of manufacture when stored in a humidity controlled area (10 °C to 27 °C and <75 % relative humidity).

4.5 Availability

For availability, please contact your local distributor.

5. Additional Information

To request additional product information, see address below.

Important Notice

All statements, technical information and recommendations contained in this document are based upon tests or experience that 3M believes are reliable. However, many factors beyond 3M's control can affect the use and performance of a 3M product in a particular application, including the conditions under which the product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluates the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method or application.

Values presented have been determined by standard test methods and are average values not meant to be used for specification purposes.

All questions of warranty and liability relating to 3M products are governed by the terms of the respective sale subject, where applicable, to the prevailing law.

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