Scotch® Fire-Retardant Electric Arc Proofing Tape 77 Series

Data Sheet **May 2013**

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.

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.

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.

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 Properties (Test Method is ASTM D1000 unless noted)	**Typical Value** US units (metric)	
Product Number	77 Black	77 White
Color	Black	White-Gray
Total Thickness	.030 inches (0,76 mm)	
Breaking Strength	1200 psi (8,3 MPa)	
Elongation (% at break) 23°C -12°C -18°C	 150% 130% 90%	
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** US units (metric)
Dielectric Breakdown	> 10,000V
Thermal Conductivity (23°C) ASTM C-518	0.15 BTU-ft (0,25 W/mk) ft^2-hr-°F

Coverage Table

Cable O.D. (inches)	Tape Width (inches)	Number of 20 foot rolls needed to cover 100 feet of cable with one-half lap wrap (rolls)
1”	1 ½”	21
1 ¼”	1 ½”	27
1 ½”	1 ½”	32
1 ¾”	3”	19
2”	3’	20
2 ¼”	3”	24
2 ½”	3”	27
2 ¾”	3”	29
3”	3”	32
3 ½”	3”	37
4”	3”	42
4 ½”	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

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

Product 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.
Engineering and 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.
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.

Shelf Life & Storage	This product has a 5-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/electrical [Where to Buy] or call 1.800.676.8381.

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Electrical Markets Division
6801 River Place Blvd.
Austin, TX 78726-9000
800.245.3573
FAX: 800.245.0329
www.3M.com/electrical

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