

# 3M™ Scotchrap™ Tapes 50, 51 and Pipe Primer, 3M™ Scotchfil™ Electrical Insulation Putty, All-Weather Corrosion Protection

Data Sheet

May 2013

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## Description

3M™ Scotchrap™ Tapes 50 and 51 are tough, polyvinyl chloride based tapes with special high tack adhesives formulated to resist corrosion of metal piping systems above and below ground, fittings and joints on all mill-coated pipe and electrical conduit systems. These tapes are:

- Resistant to corrosive salt water, soil acids, alkalies and salts, common chemicals, chemical vapors, and exposure to outdoor weathering and sunlight.
- Resistant to impact, abrasions, punctures, and tears. Tape 50 is highly conformable, all-weather 10 mil (0,254 mm) thick tape designed for application over a wide temperature range. Tape 51 provides similar qualities in a thicker, 20 mil (0,508 mm) tape. Both tapes have electrical insulating properties.

3M™ Scotchrap™ Pipe Primer is a quick-dry, non-sag rubber base primer that permeates metal surface pits and irregularities, preparing the surface for tape application. The primer is compatible with the special adhesives on these tapes, as it enhances adhesion.

3M™ Scotchfil™ Electrical Insulation Putty is used as a build-up compound on highly irregular surfaces such as fittings and valves, providing a smooth, waterproof taping surface. The putty is soft and pliable – simply press putty into place on irregular surfaces, mold with finger pressure and over tape using standard methods.

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## Application of Primer, Putty and Tape:

The Scotchrap Tapes 50 and 51 are easy to apply without special tools or dangerous flame. However, a few general application procedures should be followed to obtain optimum performance. Surfaces to be wrapped should be clean, dry and free of oil, grease, and other contaminants. Blast removal of rust and scale is preferred. Welding slag and spatter, sharp edges or burrs should be chipped, grinded or filed.

Apply a uniform, continuous coating of the pipe primer to the prepared surface and let dry. Fill in irregular surfaces with the putty. Cover weld bead with one wrap of tape over the entire surface.

Straight pipe and conduit are normally spirally wrapped using tape width listed in coverage table. Field joints on mill-coated pipe can be wrapped spirally or with a cigarette wrap or wide tape. Unusually severe construction or soil conditions may require additional tape thickness or protective overwraps.

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## 3M™ Scotchrap™ Tapes 50, 51 & Pipe Primer, 3M™ Scotchfil™ Electrical Insulation Putty

### Application of Primer, Putty and Tape, *continued*

For below ground installation adequate provision should be taken to protect the coating from physical damage during pipe handling, lowering or backfilling operations.

The pipeline ditch should be free of rock or other sharp objects so the coated pipe rests on a smooth bed of soil. Backfill materials should also be free of rock or other sharp objects to avoid damage of the coating. After layer of debris-free soil has covered the pipe, general backfill may be used.

### 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.

### 3M™ Scotchrap™ Pipe Primer

| Property                                                                    | Typical Value US units (metric)                |
|-----------------------------------------------------------------------------|------------------------------------------------|
| Color                                                                       | Black                                          |
| % Solids                                                                    | 30                                             |
| Weight                                                                      | 7lbs. /gal. (0.84 kg/litre)                    |
| Coverage<br>@ 1 mil (0,025 mm) dry film thickness                           | 700 sq. ft. /gal. (17.4 m <sup>2</sup> /litre) |
| Drying Time<br>@ 75°F (24°C) and 50% RH 1 mil (0,025 mm) dry film thickness | 15 min.                                        |
| Flash Point                                                                 | 19°F (-7.2°C)                                  |

### 3M™ Scotchfil™ Electrical Insulation Putty

| Property<br>(Test Method ASTM D-1000 unless otherwise stated) | Typical Value<br>US units (metric) |
|---------------------------------------------------------------|------------------------------------|
| Color                                                         | Black                              |
| Thickness                                                     | 125 mils                           |
| Elongation                                                    | 1000% min.                         |
| Dielectric Strength                                           | 575 V/mil                          |
| Insulation Resistance                                         | >1 x 10 <sup>6</sup> Ω             |

### 3M™ Scotchrap™ Tapes 50 and 51, All-Weather Corrosion Protection Tapes

| Property<br>(Test Method ASTM D-1000 unless otherwise stated) | 50 Tape<br>US units (metric)                    | 51 Tape<br>US units (metric)                    |
|---------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| Classification Specification L-T-1512A (Federal)              | Type III                                        | Type II                                         |
| Color - Backing                                               | Black                                           | Black                                           |
| Color - Adhesive                                              | Black                                           | Black                                           |
| Thickness                                                     | 10 mils (0,254 mm)                              | 20 mils (0,508 mm)                              |
| Elongation @ Break<br>10°F (-12°C)<br>74°F (23°C)             | 100%<br>200%                                    | 100%<br>150%                                    |
| Breaking Strength                                             | 20 lb./in. (3,5 kN/m)                           | 40 lb./in. (7,0 kN/m)                           |
| Adhesion to Steel<br>10°F (-12°C)<br>74°F (23°C)              | 30 oz/in (0,328 kN/m)<br>20 oz./in (0,219 kN/m) | 30 oz/in (0,328 kN/m)<br>20 oz./in (0,219 kN/m) |
| Adhesion to Backing<br>10°F (-12°C)<br>74°F (23°C)            | 30 oz/in (0,328 kN/m)<br>20 oz./in (0,219 kN/m) | 30 oz/in (0,328 kN/m)<br>20 oz./in (0,219 kN/m) |
| Roll Unwind<br>10°F (-12°C)<br>74°F (23°C)                    | 16 oz/in (0,175 kN/m)<br>16 oz/in (0,175 kN/m)  | 16 oz/in (0,175 kN/m)<br>16 oz/in (0,175 kN/m)  |

## 3M™ Scotchrap™ Tapes 50, 51 & Pipe Primer, 3M™ Scotchfil™ Electrical Insulation Putty

### Typical Properties, *continued*

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.

### 3M™ Scotchrap™ Tapes 50 and 51, All-Weather Corrosion Protection Tapes, *continued*

| Property<br>(Test Method ASTM D-1000 unless otherwise stated)                                                 | 50 Tape<br>US units (metric)        | 51 Tape<br>US units (metric)        |
|---------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| <b>Water Vapor Transmission Rate</b><br>(ASTM D-3833)<br>g/100 in <sup>2</sup> (645 cm <sup>2</sup> ) /24 hrs | 1.0                                 | 1.0                                 |
| <b>Moisture Absorption</b> (ASTM D-570)                                                                       | .30%                                | .35%                                |
| <b>Resistance to Weathering</b> (3M)<br>Weatherometer                                                         | 100 Hrs.                            | 100 Hrs.                            |
| <b>Dielectric Break Down Voltage</b>                                                                          | 12,000 volts                        | 20,000 volts                        |
| <b>Normal Application</b><br>Temperature Range                                                                | +10°F to 150°F<br>(-12°C to 65.6°C) | +10°F to 150°F<br>(-12°C to 65.6°C) |
| <b>Normal Service</b><br>Temperature Range                                                                    | -55°F to 175°F<br>(-48°C to 80°C)   | -55°F to 175°F<br>(-48°C to 80°C)   |

Note: For 3M™ Scotchrap™ Tapes 50 and 51 to work properly, all metal surfaces must be coated with 3M™ Scotchrap™ Pipe Primer before wrapping with the tape.

| Tape Width | # Rolls per Square |
|------------|--------------------|
| 1"         | 12                 |
| 2"         | 6                  |
| 4"         | 3                  |
| 6"         | 2                  |
| 12"        | 1                  |

All widths are in 100 ft. rolls. 1 square = 100 sq. ft. (i.e., a roll 1 ft. wide x 100 ft. long)  
To convert to rolls, multiply the number of squares by the number of roll/square from the above tables

### 3M™ Scotchrap™ Tapes 50 and 51, All-Weather Corrosion Protection Tape – Pipe Coverage Table

| Paper Size            |               |                      | Squares of Tape for 100 Linear Ft. Pipe |             |
|-----------------------|---------------|----------------------|-----------------------------------------|-------------|
| Nominal I.D. (Inches) | O.D. (Inches) | Suggested Tape Width | Minimum Overlap 1/2"                    | Half-Lapped |
| 1/2                   | 0.84          | 1                    | 0.44                                    | 0.44        |
| 3/4                   | 1.05          | 2                    | 0.37                                    | 0.55        |
| 1                     | 1.32          | 2                    | 0.46                                    | 0.69        |
| 1-1/4                 | 1.66          | 2                    | 0.58                                    | 0.87        |
| 1-1/2                 | 1.90          | 2                    | 0.66                                    | 0.99        |
| 2                     | 2.38          | 2                    | 0.83                                    | 1.25        |
| 2-1/2                 | 2.88          | 2                    | 1.00                                    | 1.51        |
| 3                     | 3.50          | 4                    | 1.05                                    | 1.83        |
| 3-1/2                 | 4.00          | 4                    | 1.20                                    | 2.09        |
| 4                     | 4.50          | 4                    | 1.35                                    | 2.36        |
| 5                     | 5.57          | 4                    | 1.59                                    | 2.92        |
| 6                     | 6.63          | 6                    | 1.89                                    | 3.47        |
| 7                     | 7.63          | 6                    | 2.18                                    | 3.99        |
| 8                     | 8.63          | 6                    | 2.46                                    | 4.52        |
| 10                    | 10.75         | 6                    | 3.07                                    | 5.63        |
| 12                    | 12.75         | 6                    | 3.64                                    | 6.67        |
| 14                    | 14.00         | 6                    | 4.00                                    | 7.33        |

## 3M™ Scotchrap™ Tapes 50, 51 & Pipe Primer, 3M™ Scotchfil™ Electrical Insulation Putty

### 3M™ Scotchrap™ Tapes 50 and 51, All-Weather Corrosion Protection Tapes – Pipe Coverage Table, *cont.*

| Paper Size            |               |                      | Squares of Tape for 100 Linear Ft. Pipe |             |
|-----------------------|---------------|----------------------|-----------------------------------------|-------------|
| Nominal I.D. (Inches) | O.D. (Inches) | Suggested Tape Width | Minimum Overlap 1/2"                    | Half-Lapped |
| 16                    | 16.00         | 6                    | 4.57                                    | 8.37        |
| 18                    | 18.00         | 6                    | 5.14                                    | 9.42        |
| 20                    | 20.00         | 6                    | 5.71                                    | 10.47       |
| 22                    | 22.00         | 6                    | 6.28                                    | 11.51       |
| 24                    | 24.00         | 6                    | 6.85                                    | 12.56       |
| 26                    | 26.00         | 6                    | 7.42                                    | 13.61       |
| 28                    | 28.00         | 6                    | 8.00                                    | 14.65       |
| 30                    | 30.00         | 6                    | 8.56                                    | 15.70       |
| 36                    | 36.00         | 6                    | 10.28                                   | 18.84       |

While the chart gives coverage data for most common sizes, the following formula may be helpful for non-standard items:

$$\text{Squares of Tape} = \frac{\square (\text{LP}) (\text{DP}) \text{TW}}{1200 (\text{TW-OV})}$$

Where  $\square = 3.14$

LP = length of pipe (ft.)

DP = outside diameter of pipe (in.)

TW = tape width (in.)

OV = overlap of tape (in.)

When using metrics,

$$\text{Squares of tape} = \frac{\square (\text{LP}) (\text{DP}) \text{TW}}{9290 (\text{TW-OV})}$$

#### Metric Conversions

1 inch = 25.4 millimeters

1 foot = 0.3048 meter

1 sq. ft. = 0.092 sq. meter

1 gallon = 3.785 liters

#### Primer Coverage

1 gallon of 3M Scotchrap Pipe Primer will cover up to 700 sq. ft., depending on the surface condition of the pipe. To calculate area of pipe for primer coverage:

$$\text{Sq. ft. of pipe} = \square (\text{DP} \div 12) (\text{LP})$$

#### Shelf Life & Storage

These products have 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 1-800-245-0329.

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