



# Scotchcast™

## Signal and Control Inline Splicing Kits 72-N Series

### Data Sheet

#### Product Description

3M™ Scotchcast™ Inline Splicing Kits 72-N Series is a series of rigid body splices tailored for joining signal and control cables. The kits are designed to accommodate shielded or unshielded constructions of plastic or rubber-jacketed cables. Six kit sizes cover a range of cables up to 100-pair (200 conductors) 10 AWG or 200-pair (400 conductors) 22 AWG.

The 72-N series splice consists of a rigid-body mold filled with pliable polyurethane 3M Scotchcast Electrical Insulating and Sealing Compound 2104.

Jumper wires with clips provide for shield continuity on shielded cables. Built-in spacer webbing automatically provides for cable centering and proper compound coverage. The kits are sized for, but do not include, 3M™ Scotchlok™ Insulated Butt Connectors. The completed splice is designed and tested for direct burial.

#### Kit Contents

Each kit contains sufficient quantities of the following materials to make one (1) splice, excluding inline connectors:

- One two-part translucent mold body with tongue and groove seams and built-in spacer webbing
- 3M™ Scotchcast™ Electrical Insulating and Sealing Compound 2104 in convenient 3M closed mixing pouch
- Two pour spouts for kits 72-N1, 72-N2, and 72-N3; one top cap cover for kits 72-N4, 72-N5 and 72-N6
- Scotch® Rubber Splicing Tape 23 for constructing sealing collars and sealing splice body ends
- One nonconductive abrasive cloth for preparing cable
- One bonding (jumper) wire with clips for providing solderless shield continuity on shielded cables (except 72-N1 kit)
- Instructions showing proper installation techniques for shielded and unshielded signal and control cables

#### Splice Features

- Versatility is designed into each kit to allow a wide range of cable sizes



- The 72-N2 through 72-N6 kits will accommodate shielded or unshielded cable. The 72-N1 kit is recommended for unshielded cable only
- Convenient kits simplify ordering and stocking
- Kits provide all materials needed to reinsulate, reconnect shield, and re-jacket one splice
- Compound has low viscosity for fast, complete filling of splice
- Compound has low exotherm which will not damage plastic insulated cable
- Convenient closed mixing pouch container permits clean, easy compound handling
- Polypropylene mold with built-in spacer web automatically provides for cable centering and compound coverage
- No special tools required; normal hand tools only

#### Applications

To splice signal and control cables rated up to 1000 volts, sized 0.25–3.25" (6.4–82.6 mm) O.D.

- For inline splicing of shielded or unshielded cables
- For use on plastic or rubber jacketed cables
- For use on cables with plastic or rubber insulated conductors
- For use in direct burial applications
- For use with underground systems
  - Manhole
  - Handhole
  - Junction box
- For use in indoor applications
  - Vault
  - Cable tray
  - Junction box
  - Duct
- For joining of cable reel-ends
- For repair of cable failures and dig-ins

## Data: Physical and Electrical Properties

3M™ Scotchcast™ Inline Splicing Kits 72-N Series can be used on cable that operates continuously at 90°C (194°F) and has an emergency overload temperature rating of 130°C (266°F). The splices are rated at 1000 volts.

## Moisture-Resistance Test

Thermal cycling submerged in water pressurized to simulate a 1.8 m (6') head: the splice 72-N series exceeds  $1.0 \times 10^6$  ohms insulation resistance after ten temperature cycles of 2°C to 24°C (35°F to 75°F).

## Splice Selection Guide

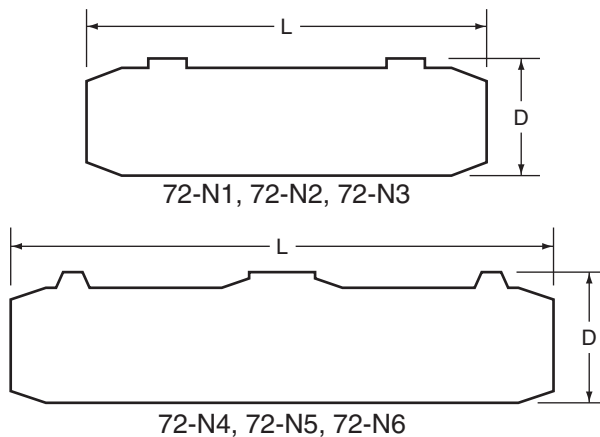
| Kit No. | Cable Diameter   |                  | 3M™ Scotchlok™ Insulated Butt Connectors |           |                     |           |                   |           |                     |           |                   |           |                     |           |
|---------|------------------|------------------|------------------------------------------|-----------|---------------------|-----------|-------------------|-----------|---------------------|-----------|-------------------|-----------|---------------------|-----------|
|         |                  |                  | 18–22 AWG                                |           |                     |           | 14–16 AWG         |           |                     |           | 10–12 AWG         |           |                     |           |
|         |                  |                  | MV18BC<br>MN18BC                         |           |                     |           | MV14BC<br>MN14BC  |           |                     |           | MV10BC<br>MN10BC  |           |                     |           |
|         |                  |                  | Shielded Cables**                        |           | Unshielded Cables** |           | Shielded Cables** |           | Unshielded Cables** |           | Shielded Cables** |           | Unshielded Cables** |           |
|         | Min.             | Max.             | No. Cond.                                | No. Pairs | No. Cond.           | No. Pairs | No. Cond.         | No. Pairs | No. Cond.           | No. Pairs | No. Cond.         | No. Pairs | No. Cond.           | No. Pairs |
| *72-N1  | 0.250" (6.4 mm)  | 0.625" (15.9 mm) | —                                        | —         | 6                   | 3         | —                 | —         | 4                   | 2         | —                 | —         | 3                   | —         |
| 72-N2   | 0.500" (12.7 mm) | 1.000" (25.4 mm) | 18                                       | 9         | 32                  | 16        | 12                | 6         | 19                  | 9         | 8                 | 4         | 13                  | 6         |
| 72-N3   | 0.625" (15.9 mm) | 1.500" (38.1 mm) | 42                                       | 21        | 75                  | 37        | 24                | 12        | 45                  | 22        | 14                | 7         | 27                  | 13        |
| 72-N4   | 1.000" (25.4 mm) | 2.000" (50.8 mm) | 74                                       | 37        | 160                 | 80        | 50                | 25        | 90                  | 45        | 40                | 20        | 60                  | 30        |
| 72-N5   | 1.250" (31.8 mm) | 2.250" (57.2 mm) | 140                                      | 70        | 200                 | 100       | 120               | 60        | 160                 | 80        | 100               | 50        | 100                 | 50        |
| 72-N6   | 1.250" (31.8 mm) | 3.250" (82.6 mm) | 350                                      | 180       | 400                 | 200       | 220               | 110       | 250                 | 125       | 180               | 90        | 200                 | 100       |

\* Not recommended for use on shielded cable.

\*\* Figures based on IMSA cable specifications.

## Typical Dimensions

| Kit No. | L                 | D                 |
|---------|-------------------|-------------------|
| 72-N1   | 7 1/8" (181 mm)   | 1 1/2" (38 mm)    |
| 72-N2   | 10 9/16" (268 mm) | 1 15/16" (49 mm)  |
| 72-N3   | 15 7/16" (392 mm) | 2 1/2" (64 mm)    |
| 72-N4   | 15 5/8" (397 mm)  | 3 9/16" (90 mm)   |
| 72-N5   | 20 5/16" (516 mm) | 4 3/4" (121 mm)   |
| 72-N6   | 25" (635 mm)      | 5 15/16" (151 mm) |



## Typical Properties

### 3M™ Scotchcast™ Electrical Insulating and Sealing Compound 2104

| Property                 | Test Method                                                                                                       | Typical Value                                            |
|--------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| Tensile Strength         | ASTM-D-412                                                                                                        | 600 psi (4.14 MPa)                                       |
| Elongation               | ASTM-D-412                                                                                                        | 150%                                                     |
| Hardness                 | Shore A                                                                                                           | 70                                                       |
| Apparent Free Isocyanate | Distill 15 min. at 170°C (338°F) and 3mm mercury vacuum<br>Distill 15 min. at 77°C (171°F) and 3mm mercury vacuum | 3.5%<br><0.1%                                            |
| Viscosity                | Brookfield at 20 rpm                                                                                              | 1200 cps                                                 |
| Gel Time                 | 180 gm sample at 23°C (73°F)                                                                                      | 15 min.                                                  |
| Exotherm                 | 180 gm sample at 24°C (75°F)                                                                                      | 66°C (150°F) max.                                        |
| Water Absorption         | 7 days in 23°C (73°F) water                                                                                       | 0.28%                                                    |
| Insulation Resistance    | Aged 28 days/35°C (95°F) 96% RH                                                                                   | 5 x 10 <sup>10</sup> ohms                                |
| Dielectric Constant      | ASTM-D-150                                                                                                        | 4.1 at 10 <sup>3</sup> Hz<br>3.8 at 10 <sup>6</sup> Hz   |
| Dissipation Factor       | ASTM-D-150                                                                                                        | 0.04 at 10 <sup>3</sup> Hz<br>0.05 at 10 <sup>6</sup> Hz |
| Hydrolytic Stability     | 7 days in water at 100°C (212°F)                                                                                  | +2.4%<br>-10 points Shore A hardness                     |
| Dry Heat Aging           | 21 days at 132°C (270°F)                                                                                          | -4.7% wt. loss + 10 Shore A                              |
| Copper Corrosion         | 30 days at 35°C (95°F), 96% RH under 45 V                                                                         | 0                                                        |
| Stress Cracking          | On cut and stressed polyethylene for 48 hours/49°C (120°F)                                                        | 0                                                        |
| Fungus Resistance        | ASTM-G-21                                                                                                         | 0                                                        |

## Specification

### Product

(open specification)

Signal and control cable splices must be capable of normal continuous operation at 1000 volts. The splices must consist of a rigid polypropylene mold body with a built-in spacer web to automatically provide for cable centering and proper compound coverage; the mold body shall be filled with a flexible polyurethane electrical compound capable of continuous operation at 90°C (194°F), with an emergency overload temperature rating of 130°C (266°F).

Splices must have provisions for inline splicing of shielded or unshielded, plastic or rubber jacketed, plastic or rubber insulated, signal and control cables. The splices shall be rated for direct burial applications.

### Engineering/Architectural

(closed specification)

Splicing of all signal and control cables rated at 1000 volts or less and sized with an outside diameter of 0.25"–3.25" (6.4–82.6 mm) shall be performed in accordance with the instructions provided with 3M Scotchcast Signal and Control Cable Inline Splicing Kit 72-N Series.

## Installation Techniques

The exact instructions for constructing each splice are packed in each kit. The following summarizes these instructions:

1. Prepare cable to dimension "A" for splice opening, removing shielding and core wrapper according to steps for shielded cable or unshielded cable, as applicable.
2. Install 3M™ Scotchlok™ Insulated Butt Connectors, not provided, staggering individually or in pairs. Observe color coding.
3. Install jumper bonding wire to shielded cables; construct sealing collars with Scotch® Rubber Tape 23 provided.
4. Trim mold body ends to fit cable and install over splice.
5. Seal mold ends with Scotch Tape 23 provided.
6. Install pour spouts into kits 72-N1, 72-N2 and 72-N3.
7. Mix 3M Scotchcast 2104 compound and pour into splice body, filling completely. Allow compound to cure.

## Maintenance

The components within this kit are stable under normal storage conditions. Normal storage and stock rotation are recommended.

The 2104 compound is not impaired by freezing; however, it should be warmed to 0°C (32°F) before being mixed and poured.

## Availability

3M Scotchcast Inline Splicing Kits 72-N Series are available in six sizes from your local 3M authorized electrical distributor. The kits will splice signal and control cables sized 0.25"–3.25" (6.4–82.6 mm) outside diameter, as shown in the splice selection guide table.

## CAUTION

Working around energized electrical systems may cause serious injury or death. Installation should be performed by personnel familiar with good safety practice in handling electrical equipment. De-energize and ground all electrical systems before installing product.

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