3M™ Scotchcast™ Electrical Insulating Resin 4N

Data Sheet **September 2016**

Product Description

3M Scotchcast Electrical Insulating Resin 4N is a two-part, epoxy insulating and encapsulating resin. This resin, mixed in its unique two-part bag, generates its own heat to cure. Its compatibility with solid and synthetic cable insulations and jackets makes Resin 4N an excellent insulator and sealer for cable splicing. Use Scotchcast resin 4N to splice solid dielectric and oil-filled cables up to 8 kV and to jacket high-voltage power cables. It is used in 3M Splice Kit Series 82N and 90-B1N.

3M™ Scotchcast™ Electrical Insulating Resin 4N is packaged in the following sizes:				
Size	g	cu. cm.	oz	cu. in.
A	88	78	3.1	4.8
B	205	181	7.2	11.1
C	414	366	14.6	22.5
D	619	548	21.8	33.6
D-NZ	872	772	30.7	47.3
E	288	255	10.1	15.6

Agency Approvals & Self Certifications

For RoHS information, please visit www.3M.com/ROHS

Resin Features

- Excellent multi-purpose moisture sealing resin
- Two-part closed mixing pouch simplifies mixing and pouring
- Bonds to itself and to most modern cable jackets
- Thermal setting; designed to not melt or run once cured
- Designed to be stable at elevated temperatures
- Generates its own heat to cure
- Tough & Oil resistant

Applications

- Replace or repair the jacket on both single and multi-core power cables
- Insulate between conductors of multi-core splices operating up to 8kV
- Seal the crotch or sheath when terminating multi-core cables.

Typical Properties

Physical Property (Test Method)	**Typical Value** US units (metric)
Color	Black
Density (ASTM D792)	0.64 oz/cu in (1,11 g/cu.cm.)
Hardness (ASTM D2240)	84 Shore D
Tensile Strength (ASTM D412)	4900 psi (33.8 MPa)
Elongation (ASTM D412)	4%
Glass Transition Temperature (ASTM E1356-03)	129°F (54°C)
Maximum Exotherm (100g) (ASTM D2471-99)	338°F (170°C)
Gel Time @ 73°F (23°C) (ASTM D2471-99)	16 minutes
Moisture Absorption @ 73°F (23°C)	2.6% wt. gain in 168 hrs
Adhesion to Metals (lb/in^2) (3M TM456)	
Copper	93.6
Brass	50.7
Steel	167.4
Aluminum	30.9
Adhesion to Cable Jackets (lb/in^2) (3M TM457)	
Vinyl	99.5
Neoprene	>150
Nylon	>95
XLPE	>218

Electrical Property (Test Method)	**Typical Value**
Dielectric Strength (ASTM D149)	500 v/mil
Dielectric Constant @ 60Hz (ASTM D150)	
73°F (23°C)	3.1
140°F (60°C)	3.9
194°F (90°C)	6.0
Dissipation Factor @ 60Hz (ASTM D150)	
73°F (23°C)	0.5%
140°F (60°C)	5.1%
194°F (90°C)	>20%

Note: this data is not to be used for specifications. Values listed are typical and should not be considered minimum or maximum.

Specifications - Product

The material must be supplied in a two-part polyethylene bag with a barrier separating an epoxy and hardener. The barrier must be capable of being broken to permit mixing the two parts without opening the bag.

Specifications – Engineering/ Architectural

The material must be 3M Scotchcast Electrical Insulating Resin 4N. It must be packaged in the 3M two-part, closed mixing pouch. The resin must be mixed within the mixing pouch simply by separating the barrier between the two parts of the bag and working the contents back and forth within the bag.

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⚠ CAUTION
If there is any evidence of moisture in the cable, it must be removed and the substrate dried before applying the resin.

Installation Techniques

Thoroughly clean and dry the surface of the substrate, to which the resin will be bonded. In the case of synthetic cable jackets, the resin must be poured immediately after the surface is prepared to help create a bond.

Remove the closed mixing pouch by tearing the protective envelope.

Premix the darker side of the resin to a smooth consistency, by squeezing, before breaking the barrier. Firmly grasp each flat side of the bag near the center barrier, while pulling the sides of the barrier apart and rolling the sides of thumbs through the barrier. Break the barrier all the way across to the side seals.

Alternately squeeze each end of the bag forcing the resin back and forth. Strip the resin from the corners of the bag. Mix until the color is uniform (30 to 40 squeezes), approximately one to two minutes.

Clip off a corner of the closed mixing pouch and pour into the mold fill spout, maintaining a half-inch head. For the 4D-NZ delivery, break the second seal and pour through the nozzle.

Typical Cure Times:

Temp	Cure Time
70°F (21°C)	1 to 2 hours
50°F (10°C)	4 to 8 hours

NOTE: 3M Scotchcast Electrical Insulating Resin 4N is not impaired by freezing; however, it should be warmed to at least 60°F (16°C) before being mixed or poured.

Handling & Safety Precautions

Read all Health Hazard, Precautionary and First Aid statements found in the Material Safety Data Sheet (MSDS) and/or product label of chemicals prior to handling or use.

Shelf-Life & Storage

3M Scotchcast Electrical Insulating Resin 4N is stable for a period of three years from date of manufacture when stored at 50-80°F (10-27°C) and below 75% relative humidity.

Notes:

1. If the guard bag is removed, the shelf life could be reduced to as little as two hours under conditions of high humidity.
2. The appearance of fine crystals or hazy appearance on clear side in the liquid resin will not affect product performance.

Availability

Scotchcast resin 4N is available from your electrical distributor. Check 3M.com/electrical “Where to Buy” for names and locations.

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