



# Scotchcast™

## Electrical Resin 5400

### One-Part, Epoxy Powder Resin

- Excellent adhesion and abrasion resistance
- Excellent flexibility and elongation
- Good electrical properties
- Good impact and heat shock resistance

3M™ Scotchcast™ Electrical Resin 5400 has been specially developed for continuous coating of wire products using the electrostatic fluid bed coating process. It is well suited for

applications where flexibility and resistance to cracking due to heat shock or impact are required. Scotchcast Electrical Resin 5400 is manufactured by a fusion blend process which insures that each individual particle of powder contains all of the components necessary to effect a complete cure and attain the stated performance characteristics .

#### Scotchcast™ Electrical Resin 5400 – Typical Properties

Property	Value
Color	yellow / tan
Specific Gravity (Cured) <sup>1</sup>	1.22
Gel Time at 400°F <sup>2</sup>	18-25 seconds
Dielectric Strength 12 to13 mil film <sup>3</sup>	7,000 - 9,000 volts (Shot Box)
Dissipation Factor @ 100 Hz <sup>4</sup>	0.5% @ 25°C 8.0% @ 25°C after 3 minutes 8.0% @ 25°C after 1 hour 0.5% @ 150°C after 18 hours
Dielectric Constant @ 100 Hz <sup>4</sup>	3.8 @ 25°C 4.5 @ 150°C
Flexibility*	no cracks 50% elongation of copper wire
Heat Shock*	no visible faults up to 260°C 90° Bend, 6x mandral
Cut-Through*	365°C
Dielectric Strength* -	6000 volts 5 mil total build
Dielectric Strength* @ 155°C	5000 volts 5 mil total build
Cut-Through Resistance <sup>2</sup>	170 -190°C

\*IEC-317

\*Not recommended for specification purposes. Product specifications will be provided upon request.

Test Methods

<sup>1</sup> ASTM D-792

<sup>2</sup> 3M Test Method

<sup>3</sup> ASTM D-149

<sup>4</sup> ASTM D-150

## Cure Specifications

The cure of Scotchcast™ Electrical Resin 5400 to a thermoset condition involves a time/temperature relationship. The table below provides nominal guidelines for obtaining the resin's adhesion, impact and chemical resistance characteristics. Times indicated by the table do not include the interval needed for the part to reach cure temperature. The user must determine the time and temperature required, based on size and type of material to be coated.

Cure Temperature	Time
200°C (392°F)	15 minutes
250°C (482°F)	5 minutes
300°C (572°F)	90 seconds
350°C (662°F)	30 seconds

## Applications

Resin 5400 offers single coat, tough conductor insulation for use in power and distribution transformers. Its ability to provide uniform edge coverage makes the product particularly well-suited for coating rectangular conductors.

Resin 5400 provides high dielectric strength as well as heat, moisture and chemical resistance. It maintains stability in transformer oil and is compatible with cellulose-based materials, core steels and various varnishes.

Resin 5400 was designed to provide advantages over the two most commonly used conductor insulations - polyvinyl formal enamel and paper. Compared to polyvinyl formal enamel, it offers a superior, tougher insulation at high temperatures, along with thermal stability, and an opportunity for cost reduction.

The major advantage of resin 5400 over paper wrapped insulation is that it provides equivalent insulating properties, but with less thickness than paper, resulting in substantial space savings, and a more efficient, more reliable and thermally stable insulation than that yielded by paper wrap.

## Ordering Information

For ordering technical or product information, or a copy of the Material Safety Data Sheet, call:

Phone: 800/722-6721 or 512/984-1038

Fax: 800/828-9329 or 512/984-2210

## Important Notice

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## Preparation and Application

Before applying resin 5400, make certain that the object to be coated is clean, dry and free of oils. Coating is accomplished first by charging the powder in an electrostatic fluid bed. When a grounded object is passed through, or placed in this cloud, it becomes coated. The resin can be deposited in film thickness of 2 to 15 mils. Because it is applied to a room temperature substrate, it is possible for the powder to be selectively removed. Air used for fluidizing should be dried to -20°C (-4°F) dew point or lower.

Curing is achieved by heating the coated unit to a temperature above the melting point of the resin. Under these conditions, resin 5400 melts, flows, gels, cures and bonds to the substrate. The result is a smooth continuous coating.

## Application Equipment

Equipment is available for processes utilizing manual or automated application techniques. Manufacturers' names can be suggested upon request.

## Storage

Laboratory evaluation indicates that the usable shelf life of this product is twenty four (24) months from the date of manufacture providing the material is stored in its original container at temperatures not exceeding 16°C (60°F). Care should be taken when removing the resin from its original shipping container to prevent contamination. After the resin is removed, the bag should be retied immediately to avoid agglomeration caused by excess moisture.

## Handling and Safety Precautions

Read all Health Hazard, Precautionary, and First Aid statements found in the Material Safety data sheet and/or product label of chemical prior to handling or use.

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# 3M

## Corrosion Protection Department

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