3M™ Scotchcast™ Electrical Resin 5N

Two-Part, Room-Curing, Class B, Rigid, Unfilled Epoxy Liquid Resin

Data Sheet **September 2016**

Description

3M™ Scotchcast™ Electrical Resin 5N resin is designed for electrical and electronic applications designed to operate @ 130°C (Class B) temperatures are the intended areas of use for 3M™ Scotchcast Electrical Resin 5N. This transparent resin offers good physical and electrical properties plus low viscosity for maximum impregnating qualities.

- Good physical properties
- Reversion resistant
- Low viscosity

Handling Properties

Mix Ratio (A-B)	Wt 2:1 Vol (%) 63.5 : 36.5
Viscosity **@ 23°C (73°F)**	A = 12,500 cps B = 100 cps Mixed = 3,000 cps
Density	A = 1.16 kg/l (9.71 lbs/gal) B = 0.995 kg/l (8.30 lbs/gal)
Flash Point	A = 232°C (450°F) B =82°C (180°F)
Gel Time	18 min. @ 60°C (140°F)
Curing Guide	23°C (73°F) 24-48 hrs 60°C (140°F) 1 hrs 95°C (203°F) 1/2 hr

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Typical Properties

Note: These are typical values and should not be used for specification purposes.

Physical Property (*See Test Method Table)	**Typical Value** US units (metric)
Color	Transparent Yellow
Hardness (BARCOL)	15
Specific Gravity	1.12
Compressive Strength*[1] 10% Compression	13,200 psi (928 kg/cm^2)
Tensile Strength*[2] Ultimate	8000 psi (562 kg/cm^2)
Elongation (% at break)*[2]	7
Flexural Strength*[3]	12,000 psi (844 kg/cm^2)
Thermal Conductivity*[4] (Cal • cm/cm^2 • sec • °C)	4.4 x 10^{-4}
Linear Thermal Expansion*[4] (length/unit length/°C)	17.7 x 10^{-5}
Electric Strength*[5] 1/8" (3 mm) sample	325 V/mil (13 kV/mm)
Mechanical Shock*[4] Ball Drop (lbs)	5 (5,8 kg)
Moisture Absorption*[4] % weight increase, 240 hrs. @ 96% R.H.	0.5
Thermal Aging % weight loss 7 days @ 105°C 1000 hrs. @ 130°C 1000 hrs. @ 155°C	 0.44 3.5 6.5
Dielectric Constant*[7] 1000 Hz 23°C	3.6
Dissipation Factor*[7] 1000 Hz 23°C	0.06
Volume Resistivity*[8]	10^{14} ohm-cm
Boiling Water Resistance 7 Days - % weight gain	 1.8
Hydrolytic Stability[6] 120 Days 71°C (160°F) 95% RH Hardness Loss % (Shore D)	1.2

Test Methods

[1]Fed, Std. No. 406, Method 1021
[2]Fed. Std. No. 406, Method 1011
[3]Fed. Std. No. 406, Method 1031
[4]MIL-I-16923E
[5]Fed. Std. No. 406, Method 4031
[6]MIL-I-16923G
[7]Fed. Std. No. 406, Method 4021
[8]Fed. Std. No. 406, Method 4041

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Usage Information

Mixing

Mix the separate parts before removing them from their containers. They may be warmed to 60ºC (140ºF) to aid the mixing process. (Gel time is approximately 20 minutes @ 60ºC). Thoroughly mix parts A and B in the correct proportions. Mix until the color is absolutely uniform and a homogeneous mixture is obtained.

De-aerating

Air introduced during mixing can be removed by evacuating at 5 to 10 mm of mercury (Hg) absolute pressure. The 3M™ Scotchcast™ Electrical Resin can be warmed to aid air removal. The container sidewall should be four times the height of the liquid resin to contain the foaming that takes place under vacuum.

Casting and Impregnating

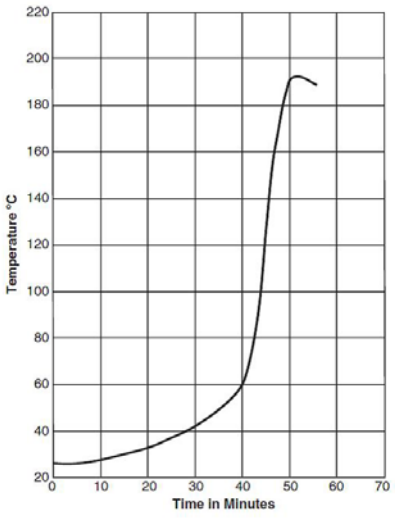
Heating the part, resin and mold aids impregnation. For maximum impregnation, evacuate at 5 mm of mercury (Hg) absolute pressure, or pour under vacuum and hold for several minutes before releasing. Castings, which require a large mass of resin, should be poured in several layers to minimize the temperature rise caused by exotherm. The heat produced by a large mass of this resin might otherwise cause the hardener to become volatile and leave bubbles in the casting.

Curing

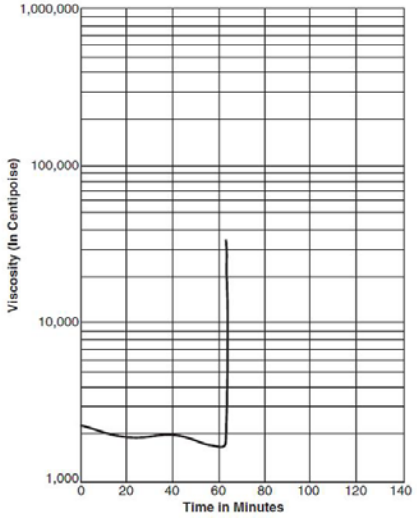
Where minimum stress and maximum thermal shock resistance are required, the ambient temperature cure cycle is recommended. (See “Curing Guide” of **Handling Properties** section). Time should be added to the cure cycle to allow the resin to reach the curing temperature.

Handling and 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.



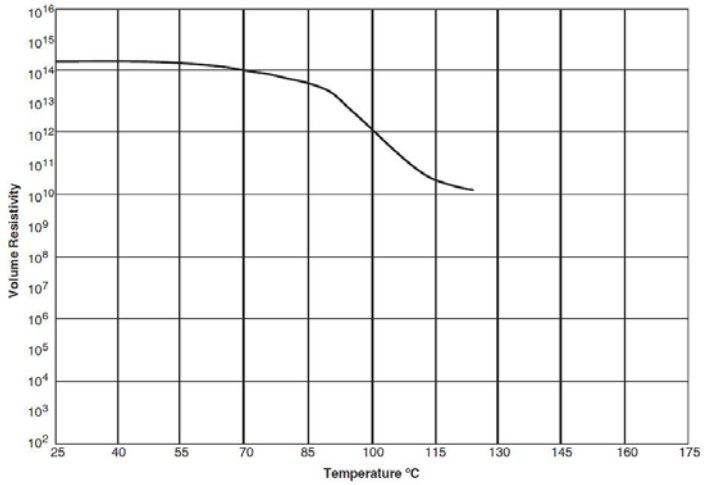
Exothermic Heat Rise for 1 lb. Sample



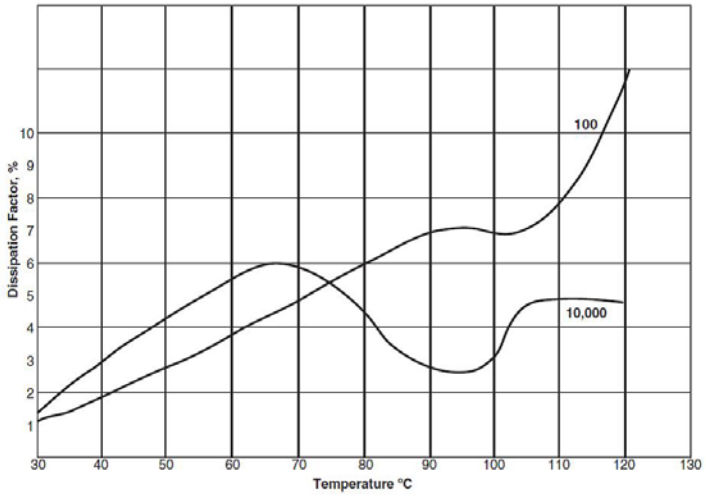
Brookfield Viscosity vs Time @ 73∝F (23∝C) 130 gram sample

3M™ Scotchcast™ Electrical Resin 5N

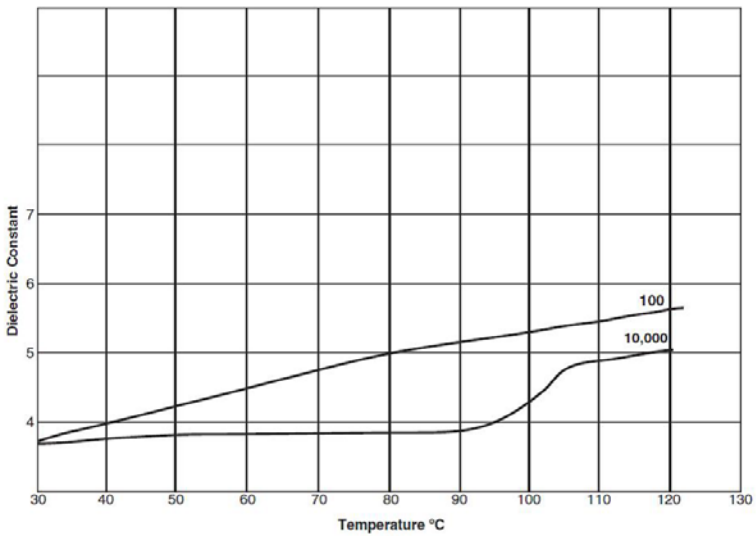
Volume Resistivity (ohm-cm)
Fed. Std. No. 406, Method 4041



Dissipation Factor %
Fed. Std. No 406
(Test Frequencies in Hertz)



Dielectric Constant
Fed. Std. No. 406, Method 4021
(Test Frequencies in Hertz)



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Shelf Life & Storage	Both parts of this resin system should be stored at temperatures between 20 to 30 degrees Celsius, and 30% to 60% relative humidity. When not in use, containers should be kept tightly closed. Storage at conditions outside those suggested may compromise the performance of the resin. Shelf life is 2 years from date of manufacture when stored in humidity controlled storage.
Availability	Please contact your local distributor; available from 3M.com/electrical [Where to Buy] or call 1-800-676-8381.

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