

Scotchcast™ Electrical Resin 9

Two-Part, Room-Curing, Class B (130°C), Semiflexible, Filled Epoxy Liquid Resin

Data Sheet

Product Description

3M™ Scotchcast™ Electrical Resin 9 is an easy-to-use resin system possessing medium viscosity and unique handling properties. It has a simple 1:1 mix ratio (by weight), a low toxicity potential and is frequently used in applications requiring excellent thermal shock and mechanical shock resistance. The resin's low exotherm and good pot life allow the user to mix substantial quantities at one time. High adhesion, low stress and low exotherm also reduce the effect of strain and temperature on sensitive components that have been coated with this resin.

- Good handling qualities
- Low exotherm
- Excellent thermal and mechanical shock resistance

Handling Properties

Mix Ratio (A:B)	Wt 1:1 Vol (%) 47:53
Viscosity @ 23°C (73°F)	A = 90,000 cps B = 20,000 cps Mixed = 28,000 cps
Density	A = 1.448 kg/l (12.08 lbs/gal) B = 1.280 kg/l (10.68 lbs/gal)
Flash Point	A = 201°C (395°F) B = 180°C (356°F)
Gel Time	28 min. @ 60°C (140°F)
Curing Guide	23°C (73°F) 24-48 hrs 60°C (140°F) 2 hrs 95°C (203°F) 1 hr

Test Methods

⁵Fed. Std. No. 406, Method 4031

¹Fed. Std. No. 406, Method 1021

⁶3M Test Method

²Fed. Std. No. 406, Method 1011

⁷Fed. Std. No. 406, Method 4021

³Fed. Std. No. 406, Method 1031

⁸Fed. Std. No. 406, Method 4041

⁴MIL-I-16923E

Typical Data/Physical Properties

Property	Value
Color	Brown
Hardness (Shore D)	70
Specific Gravity (cured)	1.42
Compressive Strength ¹	4400 psi (309 kg/cm ²)
10% Compression	
Tensile Strength ²	2200 psi (155 kg/cm ²)
Ultimate	
Elongation (% at break) ²	19
Flexural Strength ³	1100 psi (77 kg/cm ²)
Thermal Conductivity ⁴	7.4 x 10 ⁻⁴ (Cal • cm/cm ² • sec • °C)
Linear Thermal Expansion ⁴ (23°C to 113°C) (length/unit length/°C)	13 x 10 ⁻⁵
Thermal Shock ⁴	Pass
Thermal Shock ⁴ 10 cycles - 55 to 130°C 1/4" (6.35 mm) Olyphant Insert	Pass
Electric Strength ⁵ 1/8" (3.175 mm) sample	350 V/mil (13.8 kV/mm)
Mechanical Shock ⁴	7.75
Ball Drop (lbs.)	(3.5 kg)
Moisture Absorption ⁴ % weight increase, 240 hrs. @ 96% R.H.	0.8
Thermal Aging % weight loss 1000 hrs. @ 130°C	2.5
Hardness Change (Shore D)	+13
Dielectric Constant ⁷ 1000 Hz 23°C	4.6
Dissipation Factor ⁷ 1000 Hz 23°C	0.10
Volume Resistivity ⁸ 23°C (ohm-cm)	1 x 10 ¹³
Boiling Water Resistance 7 days	
- % weight gain	2.5
- Hardness Change (Shore D)	-8
Flammability ⁴	Self-extinguishing

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

Usage Information

Mixing

Mix the separate parts before removing them from their containers. They may be warmed to 60°C (140°F) to aid the mixing process. (Gel time is approximately 30 minutes @ 60°C). Thoroughly mix parts A and B in the correct proportions. Mix until the color is uniform or a homogeneous mixture is obtained.

Deaerating

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 side wall should be four times the height of the liquid resin to contain the foaming that takes place under vacuum.

Casting and Impregnating

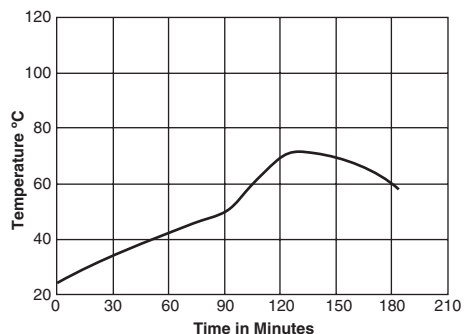
Pour the warm resin into the preheated 100°C (212°F) mold. If no mold is used, dip the preheated part into the resin. Heating the part, resin and mold aids impregnation. Evacuate at 5 mm of mercury (Hg) absolute pressure, or pour under vacuum and hold for several minutes before releasing.

Curing

Where minimum stress and maximum thermal shock resistance are required, the ambient temperature cure cycle is recommended. If an oven cure is used, time should be added to the cure cycle to allow the resin to reach the curing temperature. Cure using cycles shown under **Handling Properties**. Where higher temperatures are not objectionable and the size of the casting not excessive, the resin can be quick-cured in one hour at 95°C (203°F).

Storage

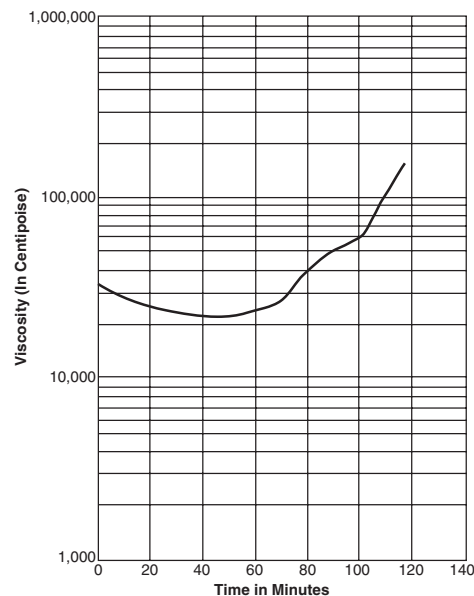
Both parts of this resin system should be stored at temperatures between 20 to 30 degrees Celsius, and 30% to 60% relative humidity. When not in use, containers should be kept tightly closed. Storage at conditions outside those suggested may compromise the performance of the resin.



Exothermic Heat Rise for 1 lb. Sample

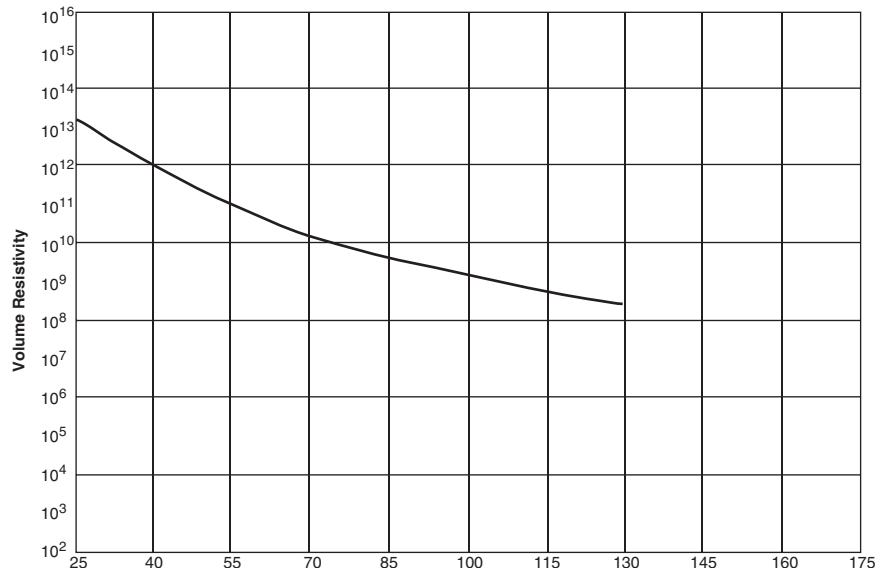
Handling and Safety Precautions

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.

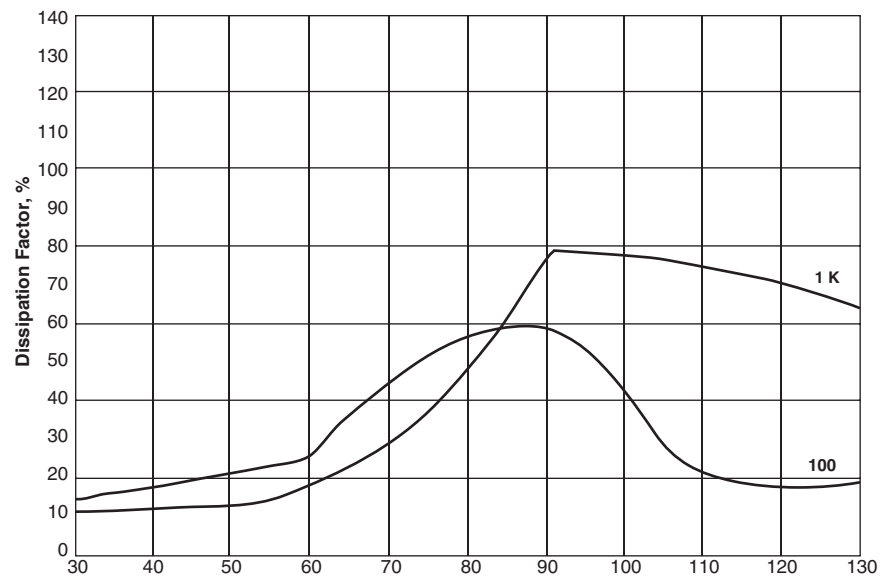


Brookfield Viscosity vs Time @ 73°F (23°C) 1 lb. sample

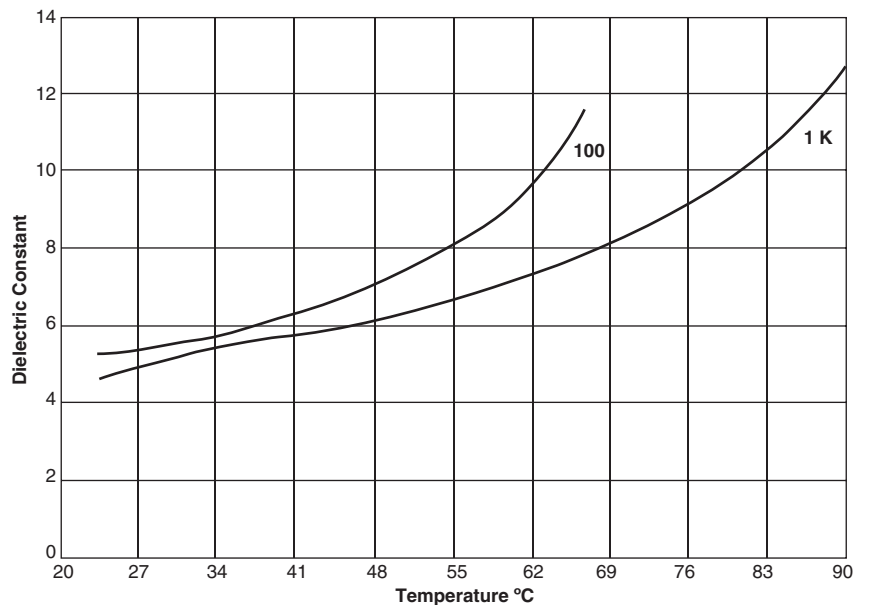
Volume Resistivity (ohm-cm)
 Fed. Std. No. 406, Method 4041



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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