



# Scotchcast™ Electrical Resin 255

Two-Part, Oven-Curing, Semiflexible, Filled, Flame-Retardant, Epoxy Liquid Resin

## Data Sheet

### Product Description

The distinguishing features of 3M™ Scotchcast™ Electrical Resin 255 are its flame retardancy and excellent shock resistance. Resin 255 meets flame retardancy requirements of Fed. Std. 406, Method 2023.1 and MIL-I-16923G. It is rated for continuous operation at 130°C. This resin also offers excellent thermal and mechanical shock resistance. The product is suggested for use in potting and encapsulating applications where shock resistance and flame retardancy are needed.

- Excellent thermal and mechanical shock resistance
- Flame retardancy per Mil-I-16923G

### Handling Properties

\*Time periods do not include those necessary to bring the part and resin up to curing temperature.

Mix Ratio (A:B)	Wt 2:3
	Vol (%) 39:61
Viscosity	A = thixotropic
@ 23°C (73°F)	B = thixotropic
	Mixed = thixotropic
Density	Part A = 13.85 lbs/gal (1.66 kg/l)
	Part B = 12.02 lbs/gal (1.44 kg/l)
l)	
Flash Point	A = 232°C (450°F)
	B = 177°C (350°F)
Gel Time	23 min. @ 120°C (248°F)
Curing Guide	95°C (203°F) 12-16 hrs.
	120°C (248°F) 2-3 hrs.

### Typical Properties

\*All values shown are typical. They are based on several determinations and are not intended for specification purposes. Product specifications will be provided upon request.

Property	Value*
Color	Off-White
Specific Gravity (mixed)	1.56
Hardness (Shore D)	72
Compressive Strength <sup>3</sup> 10% Compression	4900 psi (33.8MPa)
Tensile Strength <sup>4</sup> (1/8" x 1/2" Sample)	1500 psi (10.3 MPa)
Elongation <sup>4</sup> (% @ break)	11
Flexural Strength <sup>5</sup> (1/2" x 1/2" Sample)	4000 psi (27.5 MPa)
Flammability <sup>2</sup>	Self extinguishing
Flammability <sup>6</sup>	
Ignition Time -	86 sec
Burn Time -	156 sec
Thermal Conductivity <sup>2</sup> (Cal/sec/cm <sup>2</sup> /°C/cm)	4.5 x 10 <sup>-4</sup>
Coefficient of Linear Thermal Expansion <sup>2</sup> (23° C to 113°C) (length/unit length/°C)	15 x 10 <sup>-5</sup>
Electric Strength <sup>2</sup> [1/8" (3.175 mm) sample]	375 V/mil (14.8 kV/mm)
Thermal Shock <sup>1</sup>	
10 cycles - 55°C to 130°C	
1/8" (3.17 mm) Olyphant Inserts	Pass
1/4" (6.350 mm) Olyphant Inserts	Pass
Thermal Shock <sup>2</sup>	Pass
Mechanical Shock	
Resistance <sup>2</sup> (Weight in lb. of ball causing fracture)	>7.7 (3.5 kg)
Moisture Absorption <sup>7</sup> (% weight increase, 240 hrs. @96% RH)	.45
Water Immersion (sample cured 4 hrs. @ 120°C)	
1000 hrs @ 23°C - % weight gain	0.9
500 hrs @ 70°C - % weight gain	2.7
200 hrs. @ 100°C - % weight gain	8.0

### Test Methods

<sup>1</sup> 3M Test Method	<sup>5</sup> Fed. Std. No. 406, Method 1031
<sup>3</sup> MIL-I-16923G	<sup>6</sup> Fed. Std. No. 406, Method 2023.1
<sup>4</sup> Fed. Std. No. 406, Method 1021	<sup>7</sup> MIL-I-16923E
<sup>2</sup> Fed. Std. No. 406, Method 1011	

**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 mixing. Weigh the correct proportions of the separate parts to within 2% accuracy and combine them. Thoroughly blend the mixture until the color is absolutely uniform, or until a homogeneous mixture is obtained.

### **Deaerating**

Entrained air can be removed by evacuating for 5 to 15 minutes at 5 to 10 mm of mercury (Hg) absolute pressure. Warming the resin to 60°C (140°F) facilitates air removal. Container side walls should be four times the height of liquid resin to contain the foaming that takes place under vacuum.

### **Casting and Impregnating**

Pour the warm resin into the preheated 100°C mold. If no mold is used, dip the preheated part into the resin. Heating the resin and mold aids impregnation. For maximum impregnation, evacuate for 5 to 15 minutes 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 lower temperature cure cycle is recommended. Time should be added to the cure cycle to allow the resin to reach the curing temperature.

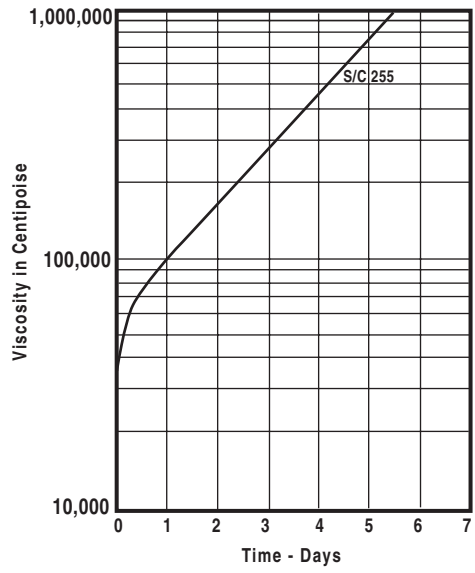
### **Storage**

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.

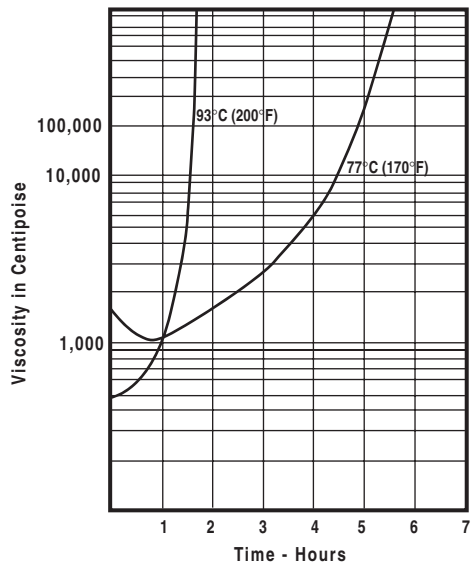
## Handling and Safety Precautions

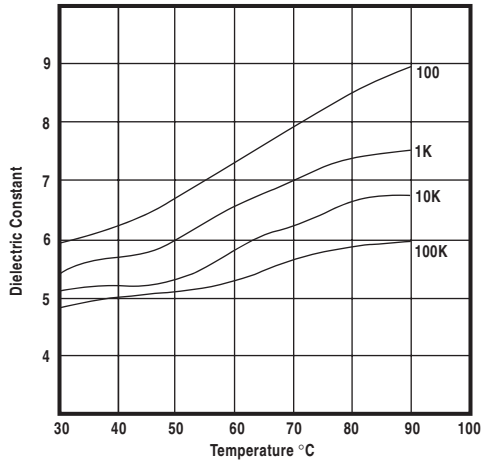
Read all Health Hazard, Precautionary and first Aid statements found in the Material Safety Data Sheets (MSDS) and/or product label of chemicals prior to handling or use.

**Brookfield Viscosity vs. Time**  
@ 23°C (73°F)

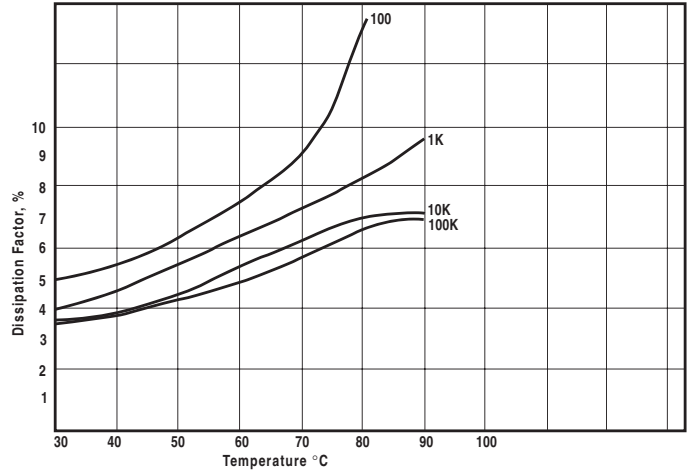


**Brookfield Viscosity vs. Time**  
@ 77°C (170°F) & 93°C (200°F)



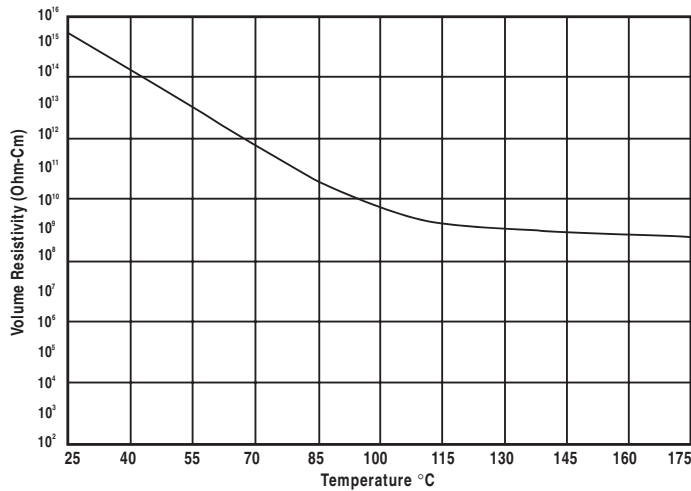


**DIELECTRIC CONSTANT**  
 Fed. Std. 406, Method 4021  
 (Test Frequencies in Hertz)



**DISSIPATION FACTOR**  
 Fed. Std. 406, Method 4021  
 (Test Frequencies in Hertz)

**VOLUME RESISTIVITY**  
 (OHM-CM)  
 Fed. Std. 406, Method 4041



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**3M**  
**Electrical Markets Division**  
 6801 River Place Blvd.  
 Austin, TX 78726-9000  
 800/676-8381  
 Fax: 800/828-9329  
 www.3M.com/electrical/oem



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