Technical data sheet



Product:	282
Manufacturer:	3M DEUTSCHLAND GMBH
Product group:	ELEKTRO
Article group:	VERGUSSMASSE
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3M[™] SCOTCHCAST[™] ELECTRICAL RESIN 282

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ScotchcastTM Electrical Resin 282

Two-Part, Oven Curing, Class F, Semiflexible, Thixotropic, Epoxy Liquid Resin

Data Sheet

Product Description

3M[™] Scotchcast[™] Electrical Resin 282 is buff colored, can be applied by dipping, spraying, extruding or troweling. As dipping resin, 282 provides exceptionally smooth and uniform coatings with minimal run off or sag during cure and is suggested for those applications requiring high temperature stability and permanent flexibility for thermal and mechanical shock resistance. Examples are dipping and encapsulation of coils, transformers, motors, modules, strain-sensitive circuitry and other electrical and electronic components.

- High temperature rating (155°C)
- High thermal conductivity
- Thermal shock resistant

Handling Properties

Mix Ratio (A:B)	Wt 2:3	
	Vol (%) 37:63	
Viscosity	A = Thixotropic	
@ 23ºC (73ºF)	B = Thixotropic	
	Mixed = Thixotropic	
Density	A = 1.50 kg/l (12.5 lbs/gal)	
	B = 1.32 kg/l (11.0 lbs/gal)	
Flash Point	A = 202°C (395°F)	
	B = 188°C (370°F)	
Gel Time	23 min. @ 121°C (250°F)	
Curing Guide	75°C (167°F) 15-20 hrs	
	95°C (203°F) 6-8 hrs	
	120°C (248°F) 2-3 hrs	
Potlife @ 23°C	3-4 days	

Test Methods

¹ Fed. Std. No. 406, Method 1021	⁶ Fed. Std. No. 406, Method 1083
² Fed. Std. No. 406, Method 1011	⁷ Fed. Std. No. 406, Method 4021
³ Fed. Std. No. 406, Method 1031	⁸ Fed. Std. No. 406, Method 4041
4MIL-I-16923E	⁹ Fed. Std. No. 406, Method 4031
⁵3M Test Method	

Typical Data/Physical Properties

Property	Value
Color	Buff
Hardness ⁶ (Shore D)	65
Specific Gravity (cured)	1 43
Compressive Strength	3500 pci
10% Compression	(245 kg/cm ²)
Tensile Strength ²	2100 psi
	(147 kg/cm ²)
Elongation (% at break) ²	45
Flexural Strength ³	2000 psi
	(140 kg/om^2)
	(140 kg/cm)
Thermal Conductivity ⁴	12 x 10⁴
$(Cal \bullet cm/cm^2 \bullet sec \bullet ^{\circ}C)$	
Coefficient of Linear Thermal Expansion ⁴	15x10⁵
(23°C to TT3°C) (length/unit length/°C)	275 volto/mil
(1/8" [3 175 mm] Sample)	(14.8 kV/mm)
Thermal Shock⁵	Pass
10 Cycles -65°C to 130°C 1/4" (3.175 mm) Olyphant Insert	
Thermal Shock ^₄	Pass
Flammability⁴	Pass
Moisture Absorption ^₄	0.32
% weight increase, 240 hrs. @ 96% R.H.	
(comple aurod 2 bro @ 120°C)	
(sample cured 3 hrs. $@ 120^{\circ}C$)	0.4
% weight gain (1000 firs. $@ 25 \text{ C}$) % weight gain (500 hrs. $@ 70^{\circ}\text{C}$)	6.2
% weight gain (200 hrs. @ 100° C)	8.0
Thermal Aging	0.0
(1000 hrs. @ 130°C) % weight loss	0.17
Hardness Change (Shore D)	+7
Dielectric Constant ⁷ (100 Hz @ 23°C)	3.56
Dissipation Factor ⁷ (100 Hz @ 23°C)	0.054
Volume Resistivity [®] (ohm-cm @ 23°C)	>1015
Thermal Aging	
(1000 hrs. @ 155°C) % weight loss	2.2
Hardness Change (Shore D)	+15
Discipation Easter ⁷ (100 Hz @ 23°C)	4.03
Volumo Posistivitu ⁸ (obm om @ 23°C)	0.032 > 10 ¹⁵
Thermal Aging	>10
(1000 hrs @ 180°C) % weight loss	3.5
Hardness Change (Shore D)	+18
Dielectric Constant ⁷ (100 Hz @ 23°C)	4.71
Dissipation Factor ⁷ (100 Hz @ 23°C)	0.041
Volume Resistivity ⁸ (ohm-cm @ 23°C)	>1015

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 a homogeneous mixture is obtained.

Deaerating

Entrapped air can be removed by evacuating for 5 to 15 minutes at 5 to 10 mm of mercury (Hg) absolute pressure. Warming the mixed resin to 60°C (140°F) facilitates this process. Container side walls should be four times the height of $3M^{TM}$ ScotchcastTM Electrical Resin to contain the foaming that takes place under vacuum.

Casting and Impregnating

Volume Resistivity (ohm-cm)

Fed. Std. 406, Method 4041

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. (See "Curing Guide" of **Handling Properties** section). 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 found in the material Safety Data Sheet (MSDS) and/or product label of chemicals prior to handling or use.



Dissipation Factor

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



Dielectric Constant Fed. Std. No. 406, Method 4021

(Test Frequencies in Hertz)



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