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Technical Data Sheet
EMCAST 501
Electrically Conductive Epoxy
Revision Date: 3/2004

EMCAST 501 is a single component, 100% solids electrically conductive U.V. and/or thermal cure epoxy system. It is highly filled with silver to provide excellent electrical conductivity and static dissipation in thin film sections. In addition, EMCAST 501 has exceptionally good thermal conductivity. This material has a low viscosity for screen printing applications or spreading over large areas.

Uncured Properties

Color:	Silver
Viscosity:	15,000 cps
Specific Gravity:	2.2
Shelf life @ 0°C or less:	6 months
Working life @ 25°C:	3 days

Cured Properties

Hardness:	85 Rex D
Thermal conductivity:	>30 W/mK
Tg:	125°C
Volume Resistivity:	0.005 $\Omega \cdot \text{cm}$
Temperature Resistance:	-50°C to 200°C
CTE	28 ppm

Cure Profile

EMCAST 501 can be cured with UV and heat or heat alone.

- ◆ Minimum UV intensities of 100 mW/cm² (using a flood lamp) or 1500 mW/cm² (using a spot cure) must be used. Minimum UV cure times start at 10 seconds.
- ◆ Minimum heat cure temperature is 110°C. Maximum heat cure temperature recommended is 150°C. Heat cure times start from 10 minutes to 1 hour. Heat cure times depend upon the thermal conductivity of the substrate.
- ◆ Always wear proper UV eye protection when working with ultraviolet light.
- ◆ While EMCAST 501 is cured by both UV and heat, the UV does not penetrate due to the high silver loading. It is recommended that UV be used in low doses to tack the material in place and then fully cure with heat.

Shipping and Unpacking Procedure

This material is packed and shipped in dry ice at -75°C to protect it and maintain a frozen state during shipment. The engineered system of an insulated container, packing material, and dry ice has been designed to protect the material for up to 6 days in transit (international) and up to 48 hours in transit (domestic).

- ◆ It is critical that the shipping container is not opened in transit and is expedited to its final destination.
- ◆ DO NOT ALLOW THE SHIPMENT TO BE LEFT ON LOADING DOCKS, IN CUSTOMS WAREHOUSES, OR ON FREIGHT TRUCKS FOR EXTENDED TIME PERIODS.
- ◆ Maintaining temperature at -5°C or less upon receipt is critical to maintain the functionality and performance of the material.
- ◆ Failure to maintain these temperatures will void any warranties and will adversely affect the materials performance.

- ◆ Upon receipt, the syringes should be transferred from the shipping container to a freezer at -5°C or less.
- ◆ Care must be taken during this step as a sudden increase in temperature can cause irreversible air voids due to the thermal expansion of the syringe barrels.

Storage and Thawing

Prior to application, the material must be allowed to thaw naturally to room temperature (ideally 20-25°C) by placing the syringes in a vertical position with dispense tip facing downward. This is a critical step for obtaining optimum dispensing performance.

- ◆ Under no circumstance should artificial heat sources be used to increase thaw speed.
- ◆ Do not place the syringes in, or near, any heat source including ovens, hot plates, hot air guns, etc. to speed thawing.
- ◆ Thaw time varies by package style, size, and ambient temperature, but is typically 30 to 120 minutes.
- ◆ Do not attempt to dispense the material before it reaches ambient temperature.
- ◆ Wipe all excess moisture or condensation from the syringes prior to use.
- ◆ A small amount of air in the tip area is normal. Carefully remove the tip cap and manually extrude a small amount of material. This will displace any air that may be in the tip area.
- ◆ A small amount of air may accumulate at the rear of the syringe near the piston. This is also normal and this air can easily be removed by manually placing a light amount of pressure on the piston near the location of the visible air with the tip cap in place. This will force the air to by-pass the piston and exit the rear of the syringe. Mount the syringe onto the dispense equipment and purge material through the system until an unbroken flow of material is extruded.
- ◆ Do not thaw and refreeze syringe more than 5 times.

Important Notice

All data in this bulletin are based on our own research and the research of others. They are believed to be accurate. However, no guarantee of accuracy is made. Product description is sold without warranty except conformity to specification and on condition that the purchasers shall determine suitability for their particular purpose.

Cautions

Good housekeeping rules are always important. Provide ample ventilation in all areas of handling, mixing and use. Avoid prolonged breathing of possible fumes. Minimize skin contact. Use of goggles, rubber gloves, and protective creams is recommended. Always wash exposed areas immediately using warm water and soap followed by rinsing with clear water. If material comes in contact with eyes, flush with clear water for fifteen minutes and consult a physician immediately.