



EPOXY POWDER, ELECTRICAL INSULATION SPRAY OR FLUIDIZED BED APPLICATION

ESF-M3L86-A

1. SCOPE

The material defined by this specification is a finely ground epichlorohydrin bisphenol epoxy resin in dry powder form. It is applied to the surface of a part from a fluidized bed.

2. APPLICATION

This specification was released originally for material used as a coating on metal for electrical insulation and corrosion protection, such as on the fuel pump motor armature for slot and end insulation.

3. REQUIREMENTS

3.0 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.2 PREPARATION OF TEST BARS

Six square steel bars (12.7 x 12.7 x 150 mm) having all significant surfaces ground to 0.75 - 1.25 micrometers rms shall be thoroughly degreased in at least two successive baths of trichloroethane. They shall then be coated per supplier's recommendations with 0.30 - 0.46 mm of resin on the flat surface. The bars shall then be cured for 5 min at 230 +/- 2 °C in an air circulating oven. This time and temperature may be deviated provided the actual time and temperature data accompany the bars at the time of submission. Test bars which do not meet the above requirements for thickness and coverage may not be reworked for submission to this specification.

3.3 DIFFERENTIAL SCANNING CALORIMETRY

The DSC thermogram for this material shall match the standard thermogram curve on file at the appropriate Materials office of the affected Product Engineering office. The thermogram shall be generated at 20 °C/min in air at 1 atmosphere (101 kPa) and shall show the Tg and the heat of reaction.

Date	Action	Revisions
2005 02 16	Revised	Inserted 3.0; Deleted 3.1, 3.8, 4
1988 09 15	Released	107002-185 CF4S



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**3.4 CUT THROUGH TEMPERATURE, min**
(Average of 2 tests)300 °C
All bars must pass

Test Method: See Figure 1. Mount the bar by means of clamps on a ring stand. Place a loop of 26 gage bare copper wire over the resin coated area 13 mm from the coated end. Attach a 227 g weight including any clamps or leads to the wire and place the test assembly in a forced air circulating type oven. Attach one lead from an 8Va-c power supply alarm circuit to the cutting wire and one to the bare end of the steel test bar. Include this lead weight as part of the 227 g load. Attach a thermocouple to the steel bar by placing in the 3.2 mm drilled hole in the bar. Secure with bolt. Start the oven and increase the temperature at a rate not to exceed 208 °C/h to allow uniform heating of the test bar. When cutting wire penetrates the resin and contacts the steel bar surface the circuit will be closed and the buzzer alarm activated. Immediately record the temperature of the test bar. This temperature shall be defined as the cut through temperature of resin. Repeat the test and record the average of the 2 tests as the cut through temperature.

3.5 DIELECTRIC STRENGTH, min
(ASTM D 149, short time, test 6 bars)

30 kV/mm

Except use the bar as one electrode and a 12.7 mm wide aluminum foil wrapped completely around the bar on the resin as the second electrode. All bars must meet or exceed the minimum.

3.6 EDGE COVERAGE, min

30%

Mask ends of 2 bars for approximately 13 mm. Coat to 0.36 +/- 0.05 mm thickness. Cure resin. Measure edge coverage as follows: (See Figure II)

- Determine bar dimensions 1-3 and 2-4 at point A.
- Determine resin coated bar dimensions 1-3 and 2-4 at point B approximately 13 mm from the edges.
- Subtract readings in step one from corresponding readings in step 2 to determine resin thickness on flat surfaces at point B. Average the resin thickness values.
- Determine bar dimensions across corners, dimensions 5 and 6 at point A.
- Determine bar dimensions across corners, dimensions 5 and 6 at point B approximately 13 mm from the coated edge.
- Subtract readings to step 4 from corresponding readings in step 5 to determine reading thickness on corners at point B. Average the resin thickness values.
- Divide the average corner resin thickness (step 4v result) by the average flat surface resin thickness (step 3 result) and multiply by 100 to calculate percent edge coverage.

Average the four results determined from two test bars to determine conformance to the specification.

3.7 Powders of different manufacture, process, blend or chemistry shall not be intermixed in the electrostatic fluidized bed without prior approval of the Product Engineering Office.