

ENGINEERING MATERIAL SPECIFICATION

Material Name

Specification Number

**EPOXY POWDER, ELECTRICAL INSULATION
ELECTROSTATIC FLUIDIZED BED APPLICATION, FUEL RESISTANT**

WSF-M3L72-A2

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 at room temperature from a fluidized bed by means of electrostatic action.

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 alternator stator and windshield wiper 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).

3.1 TEST BAR

To be run on each lot of material

3.1.1 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 micrometer) rms shall be thoroughly degreased in at least two successive baths of trichloroethane. They shall then be electrostatically coated at room temperature with 0.30 – 0.46 mm of resin on the flat surface. The bars shall then be cured for 10 minutes at 210 °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.

3.1.2 Hardness – Knoop (ASTM D 1474, 100 g load)

20 - 25

Date	Action	Revisions
2003 06 13	Revised	Para 3.0 inserted; Para 3.5, 3.6, 3.7, 3.8, 3.10, 4 deleted
1994 06 30	NGA1E10370437006	Released A. Vallabhanath

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3.1.3 Particle Size

On 60 mesh	None
Through 60 on 80 mesh, max	1.2%
Through 80 on 325 mesh	Balance
Through 325 mesh, max	37.0%

3.1.4 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/minute in air at 101 kPa and shall show the Tg and the heat of reaction.

3.2 To be run for initial approval and as specified by Quality Control. Since the above tests are required on each lot, these results will also be included as part of this testing and results reported.

3.2.1 Cut Through Temperature, min 300 °C
(Average of 2 tests) 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 8 Va-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 tape. 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 the resin. Repeat the test and record the average of the 2 tests as the cut through temperature.

3.2.2 Thermal Shock Resistance Must pass the following
on 4 bars

Place part in a circulating air oven at 154 °C for 30 minutes. Remove and quench in cold water. Dry and immediately place in alcohol-dry ice mixture at -40 °C for 10 minutes. Remove and inspect for signs of cracking, crazing, or loss of adhesion. Repeat above cycle 9 more times. At the end of the 10 cycles there must be no cracking, crazing, or signs of adhesion loss on any of the 4 test bars.