



UNSATURATED POLYESTER (UP), GLASS FIBER REINFORCED, BULK MOLDING COMPOUND (BMC)

ESF-M3D121-A1
ESF-M3D121-A2

1. SCOPE

The materials defined by these specifications are glass fiber reinforced thermoset polyester resin premixes. These materials have high strength, are self-extinguishing, and have a relatively high heat deflection temperature values.

2. APPLICATION

These specifications were released originally for materials used to mold such items as blower motor housing and brush plates (ESF-M3D121-A1), the alternator rotor (ESF-M3D121-A2).

ESF-M3D121-A1 replaces and is same as ESF-M3D121-A.

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).

3.4 MOLDED TEST SPECIMEN

3.4.1 Preparation of Test Specimens

All test specimens shall be prepared from molded plaques or equivalent. The plaques are to be manufactured from the same material and under equivalent conditions as production parts. Prepared specimens must show no evidence of fiber tear or loose fibers protruding from the specimens. No additional annealing of specimens is allowed.

		A1	A2
3.4.2	Density ISO 1183, Method A/ASTM D 792, Method A1)	1.70 - 2.05	1.70 - 2.05
3.4.3	Glass Fiber Content, By Weight, % min	15	12

Test Method: ISO 3451/1, Method B, 1 h at 650 +/- 25 °C, except use 5% by volume hydrochloric acid solution for 15 min. Rinse the glass fibers several times with distilled water before drying in an oven for 2 h at 120 +/- 2 °C. After cooling, weigh the crucibles and calculate the percent glass fibers.

Date	Action	Revisions
2004 11 17	Revised	Inserted 3.0; Deleted 3.1, 3.2, 3.3, 3.7, 3.8 & 4
1988 09 15	Released	ESF-M3D121-A2 107002-185-CF4S
1973 04 19	Released	ESF-M3D121-A F6C-136





ENGINEERING MATERIAL SPECIFICATION

ESF-M3D121-A1/A2

		A1	A2
3.4.4	Tensile Strength, MPa, min (ISO R 527/ASTM D 638, 150 min x 12.7 x 3.2 mm specimen, 5 mm/min test speed)	41.4	49
3.4.5	Flexural Strength, MPa, min (ISO 178/ASTM D 790, Method I, Procedure A, 130 x 12.7 x 3.2 mm specimen, 50 mm support span)	128	112
3.4.6	Compressive Strength, MPa, min (ASTM D 695, 12.7 x 12.7 x 25 mm specimen, 1.3 mm/min test speed)	152	168
3.4.7	Impact Strength, Izod, J/m, min (ISO 180, Method A/ASTM D 256, Method A, 63.5 x 12.7 x 3.2 mm specimen, 10 specimen minimum)	267	424
3.4.8	Water Absorption, % max (ISO 62, 24 h/ASTM D 570, 24 h)	0.2	0.2
3.4.9	Heat Deflection Temperature, C min (ISO 75/ASTM D 648, 130 x 12.7 x 12.7 mm specimen, at 1.82 MPa)	232	260

3.5 FLAMMABILITY (ISO 3795/SAE J369)

SE/NBR

The specimen size required for material approval is 355 x 100 x 6.4 +/- 0.2 mm with a smooth surface.

3.6 ELECTRICAL PROPERTIES

3.6.1	Dielectric Strength, kV/mm, min (IEC 243/ASTM D 149, in insulating oil, 3.2 +/- 0.2 mm thick specimen)		
3.6.1.1	Short Time	12.8	13.6
3.6.1.2	Step by Step (5 - 10 kV starting voltage, 20 s steps)	11.8	11.8
3.6.2	Arc Resistance, s, min (ASTM D 495)	150	180



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Page 2 of 2