UNSATURATED POLYESTER (UP) INJECTION MOLDING COMPOUND, 14% GLASS FIBER REINFORCED, LOW PROFILE **WSS-M3D178-A1**

UNSATURATED POLYESTER (UP) INJECTION MOLDING COMPOUND, 13% GLASS FIBER REINFORCED, EXTERIOR APPLICATIONS **WSS-M3D178-A2**

1. SCOPE

The material defined by these specifications is a glass fiber reinforced thermosetting injection molding compound based on unsaturated polyester resin (UP). WSS-M3D178-A2 shall be used for exterior applications only.

2. APPLICATION

These specifications were released originally for material used for complex reflector bodies.

3. REQUIREMENTS

3.0 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

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

3.4 MOLDING COMPOUND

			A1	A2
(s)	3.4.1	Filler Content		
	3.4.1.1	Ash Content, % (ISO 3451/1, Method A, 1 h at 650 +/- 25 °C)	59 - 65	62 - 72
	3.4.1.2	Glass Fiber Content, By Weight, %	12 - 16	11 - 15

Test Method: ISO 3451/1, Method B, 1 h at 650 +/- 25 °C, except use 5% by volume hydrochloric acid solution for 15 minutes. 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.

3.5 MOLDED TEST SPECIMEN

3.5.1 Preparation of Test Specimens

Unless otherwise specified all test specimens shall be prepared from injection molded plaques.

The following dimensions are required:

Date	Action	Revisions
2005 01 05	Revised	Inserted 3.0; Deleted 3.1, 3.2, 3.3, 3.8, 3.9 & 4
1995 08 18	Activated	M. Myers

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A. 150 min x 10 x 4.0 +/- 0.2 mm (Tensile Bar, ISO 3167)
B. 120 x 10 x 4.0 +/- 0.2 mm

Specimens with shorter dimensions shall be cut from the center portion of the test specimen A and/or B. The specimens shall be prepared according to ISO 294. No annealing allowed.

		A1	A2
3.5.2	Density, g/cm^3 (ISO 1183, Method A)	1.77 - 1.87	1.84 - 1.94
3.5.3	Tensile Strength at Max Load, min, MPa (ISO R 527, 150 minimum x 10 x 4.0 +/- 0.2 mm specimen, 5 mm/min test speed)	11.0	14.0
3.5.4	Flexural Modulus, GPa, min (ISO 178, 80 x 10 x 4.0 +/- 0.2 mm specimen, 2 mm/min test speed, 64 mm support span)	9.0	10.0
3.5.5	Flexural Strength, MPa, min (ISO 178, 80 x 10 x 4.0 +/- 0.2 mm specimen, 2 mm/min test speed, 64 mm support span)	25.0	35.0
3.5.6	Shear Modulus at 23 °C, GPa (ASTM D 4065, forced constant amplitude, fixed frequency of 1 Hz +/- 15%, strain level below 1%. Specimen approx. 60 x 10 x 4.0 +/- 0.2 mm cut from the center of specimen A. Specimen length between clamps 35 - 40 mm. Soak time at each temperature interval - 3 minutes minimum)	3.7 - 6.3	4.1 - 6.9

Additionally, a Shear Modulus vs. Temperature curve shall be plotted for -50 to +250 °C temperature range, at 5 °C minimum intervals. The plotted curve must be within tolerance range shown on page 5 (A1) and page 6 (A2).

3.5.7	Impact Strength, Izod, min, kJ/m^2 (ISO 180/1A, 80 x 10 x 4.0 +/- 0.2 mm specimen, 10 specimens for each test)		
3.5.7.1	At 23 +/- 2 °C	1.0	1.5
3.5.7.2	At -40 +/- 2 °C	1.0	1.5

The test specimens must be conditioned for minimum of 6 h at the above specified temperature prior to impact test. Low temperature testing shall be done within the cold box.

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