POLYPHENYLENE ETHER + POLYAMIDE BLEND (PPE+PA) 10% GLASS FIBER REINFORCED MOLDING COMPOUND **WSS-M4D977–A**

POLYPHENYLENE ETHER + POLYAMIDE BLEND (PPE+PA) 30% GLASS FIBER REINFORCED MOLDING COMPOUND **WSS-M4D977–A2**

1. SCOPE

The materials defined by these specifications are glass fiber reinforced injection molding compounds based on a polyphenylene ether and polyamide (PPE+PA) blend.

2. APPLICATION

These specifications were released originally for material used for fuel filler housings (A1) and high heat resistant splash shields (A2).

3. REQUIREMENTS

Material specification requirements are to be used for initial qualification of materials.

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 MOLDING COMPOUND

3.4.1 Melt Volume Rate, cm^3/10 minutes
(ISO 1133, 280 °C, 2.16 kg)

A	A2
14 – 37	7 - 23

The material shall be dried for 4 h minimum at 110 - 115 °C in a mechanical convection oven immediately preceding the test.

3.4.2 Glass Fiber Content, %, range
(ISO 3451/1, Method A, 1 h at 850 +/- 50 °C)

9 – 11	27 – 33

3.5 MOLDED TEST SPECIMEN

3.5.1 Preparation of Test Specimens

Unless otherwise specified all tests shall be carried out on injection molded one-end gated test specimens.

Date	Action	Revisions
2006 07 21	Revised	Inserted 3.0; Deleted 3.1, 3.2, 3.3, 3.9, 3.10 & 4
2001 11 27	Activated	M.A. Myers

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The following dimensions are required:

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.

3.5.2 Density, g/cm^3, range
(ISO 1183, Method A)

	A	A2
	1.14 – 1.20	1.32 – 1.40

3.5.3 Tensile Strength at Yield, MPa, min
(ISO R 527/ASTM D 638M, 150 min x 10 x 4.0 +/- 0.2 mm specimen, 50 mm/ minute test speed

	75	140

3.5.4 Flexural Modulus, GPa, min
(ISO 178/ASTM D 790M,
Method I, Procedure A, 80 x 10 x 4.0 +/- 0.2 mm specimen,
2 mm/min test speed, 64 mm support span,
the radius of the loading nose 5.0 +/- 0.1 mm
and of the supports 2.0 +/- 0.2 mm)

	3.1	7.3

3.5.5 Shear Modulus at 23 °C, MPa, range
(ASTM D 4065, forced constant amplitude, fixed frequency of 1 HZ +/- 15%, strain level below 1%. Specimens approximately 60 x 10 x 4.0 +/0.2mm cut from the center of specimen A. Specimen length between clamps 35 – 40 mm. Soak time at each temperature interval – 3 minutes min)

	620 – 1020	1020 - 1700

Additionally, a shear modulus versus temperature curve shall be plotted for –50 to +140 °C temperature range, at 5 °C min intervals. The plotted curve must be within tolerance range granted on the original material approval and it shall constitute the reference standard for materials supplied to this specification and shall be kept on file at designated material laboratory and be available on request.

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3.5.6 Impact Strength, Izod, kJ/m^2, min
(ISO 180, Method A/ASTM D 256, Method A, 80 x 10 x 4.0 +/-0.2 mm specimen, 10 specimens for each test)

3.5.6.1 At 23 +/- 2 °C

	A	A2
	2.7	5.7

3.5.6.2 At -40 +/- 2 °C

	2.0	3.8

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, if not possible, test can be conducted outside, but within 5 s.

3.5.7 Heat Deflection Temperature, °C, min
(ISO 75/ASTM D 648, 120 x 10 x 4.0 +/- 0.2 mm specimen, flatwise at standard deflection of 0.32 +/- 0.01 mm. At 1.80 MPa)

	167	229

All specimens dry as molded. If not tested immediately after molding, specimens must be stored in a sealed, moisture-proof container filled with silica gel.

3.5.8 Vicat Softening Temperature, °C, min
(ISO 306, 10 x 10 x 4.0 +/- 0.2 mm specimens. Bath - silicone oil, temp. raise 50 +/- 5 °C/h. Dial gage reset to '0' after addition of 5 kg weight. At 50.0 N load)

	205	242

All specimens dry as molded. If not tested immediately after molding, specimens must be stored in a sealed, moisture proof container filled with silica gel.

3.5.9 Heat Aging Performance
(ISO 188/ASTM D 573, 150 +/- 50 air changes/h, 1000 h at 85 +/- 2 °C. Unaged property values shall be determined at the time of the aged properties determination)

3.5.9.1 Tensile Strength at Yield Change +/- 25%
(Test Method per para 3.5.3)

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