

**THERMOPLASTIC ELASTOMER (TEEE)
MOLDING COMPOUND, INTERIOR****WSB-M2D452-A
WSB-M2D452-A2
WSB-M2D452-A3****1. SCOPE**

The materials defined by these specifications are flexible thermoplastic elastomeric (TEEE) injection and/or extrusion molding compounds.

2. APPLICATION

These specifications were released originally for a material used for air bag cover applications, which must be painted.

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).

**3.3 DYNAMIC MECHANICAL ANALYSIS
(ASTM D 4065)**

Ford Motor Company, at its option, may establish a shear modulus/damping vs. temperature curves plotted for -50 to +170 °C temperature range for material/parts supplied to this specification. The shear modulus and damping curves established for initial approval shall constitute the reference standard and shall be kept on file at the designated material laboratory. All samples shall produce shear modulus and damping curves that correspond to the reference standard when tested under the same conditions.

3.5 MOLDED TEST SPECIMEN**3.5.1 Preparation of Test Specimens**

Unless otherwise specified, all tests shall be conducted on specimens die cut from injection molded plaques 150 x 100 x 2.0 +/- 0.2 mm. The plaques shall be molded according to ISO 294 and film gated along the upper 100 mm edge. No annealing allowed, unless specified otherwise.

		A	A2	A3
3.5.2	Density, g/cm ³ (ISO 1183, Method A/ASTM D 792, Method A1)	1.14 - 1.16	1.15 - 1.22	1.15 - 1.22
3.5.3	Hardness, Durometer D (ISO 868/ASTM D 2240, 6 mm thick plied-up specimen, instantaneous reading)	41-52	49-64	48-63

Date	Action	Revisions
2004 09 30	Revised	Inserted 3.0; Deleted 3.1, 3.2, 3.4, 3.8, 3.9 & 4
1999 09 24	Revised	Revised para 3.5.5
1990 10 16	Released	NB00110043054042

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ENGINEERING MATERIAL SPECIFICATION

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		A	A2	A3
3.5.4	Tensile Strength at Break, MPa, min (ISO R 527, type 2/ASTM D 412, Die C, 115 x 6 x 2.0 +/- 0.2 mm specimen, 500 mm/min test speed)	16	23	23
3.5.4.1	Elongation at Break, %, min (Test acc. to para 3.5.4)	450	480	450
3.5.5	Flexural Modulus, MPa, min (ISO 178, 80 x 10 x 4.0 +/- 0.2 mm specimen, 2 mm/minute test speed, 64 mm support span)	83	390	500
3.5.6	Shear Modulus at 23 °C, MPa (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)	40	140	130
Additionally, a Shear Modulus versus Temperature curve shall be plotted for -50 to +___ °C temperature range, at 5 °C minimum intervals. The plotted curve must be within tolerance range shown on page 6 (-A), page 7 (-A2), and page 8 (-A3).				
3.5.7	Tear Strength, kN/m, min (ISO 34, Method B, procedure a/ ASTM D 624, Die C)			
3.5.7.1	Parallel to Flow	108	97	86
3.5.7.2	Perpendicular to Flow	109	100	88
3.5.8	Compression Set, %, max (ISO 815, Large Type-plyed specimen/ASTM D 395, Method B, Type 1-plyed specimen)			
3.5.8.1	22 h at 70 +/- 2 °C	51	66	66
3.5.8.2	70 h at 100 +/- 2 °C	72	83	83
3.5.9	Brittleness Point, C, max (ISO 812, Type B specimen/ ASTM D 2137, Method A)	-74	-70	-70



ENGINEERING MATERIAL SPECIFICATION

WSB-M2D452-A/A2/A3

		A	A2	A3
3.5.10	Heat Aging (ISO 188/ASTM D 573, 150 +/- 50 air changes/h, 1000 h at 110 +/- 2 °C)			
3.5.10.1	Hardness Change, max	+2	+3	+2
3.5.10.2	Tensile Strength Change, %, max	-25	-10	-10
3.5.10.3	Elongation Change, %, max	-10	-10	-10
3.5.10.4	Brittleness or Bend Test	No cracks		No cracks

3.6 FOGGING (FLTM BO 116-03)

Fog Number, min	90	90	90
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Formation of a clear film, droplets or crystals is cause for rejection.

3.7 FLAMMABILITY (ISO 3795)

Burn Rate, max	WSB-M2D452-A	100 mm/minute
	WSB-M2D452-A2/A3	DNB

The specimen size required for material approval is 355 x 100 x 1.6 +/- 0.1 mm with a smooth surface.

5. GENERAL INFORMATION

The information given below is provided for clarification and assistance in meeting the requirements of this specification.

5.1 COEFFICIENT OF LINEAR THERMAL EXPANSION (ASTM D 696)

5.1.1	Temperature Range of -50 to +50 °C			
	Parallel to flow, m/m	21 ⁻⁵ / °C	21 ⁻⁵ / °C	21 ⁻⁵ / °C
	Across flow, m/m	12 ⁻⁵ / °C	12 ⁻⁵ / °C	12 ⁻⁵ / °C
5.1.2	Temperature Range of 50 to 120 °C			
	Parallel to flow, m/m	23 ⁻⁵ / °C	23 ⁻⁵ / °C	23 ⁻⁵ / °C
	Across flow, m/m	13 ⁻⁵ / °C	13 ⁻⁵ / °C	13 ⁻⁵ / °C



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