



THERMOPLASTIC POLYURETHANE ELASTOMER (TPU) 55 DUROMETER D HARDNESS

WSK-M4D755-A1

THERMOPLASTIC POLYURETHANE ELASTOMER (TPU) 40 DUROMETER D HARDNESS

WSK-M4D755-A2

1. SCOPE

The materials defined by these specifications are rigid thermoplastic polyurethane elastomer (TPU), 55 durometer D hardness (-A1) and 40 durometer D hardness (-A2).

2. APPLICATION

These specifications were released originally for materials used for the ball at the transmission gear shift lever fulcrum (-A1) and for a component of front door latch (-A2).

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

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

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.

		A1	A2
3.4.2	Density, g/cm ³ (ISO 1183, Method A/ASTM D 792, Method A1)	1.18 - 1.22	1.16 - 1.20
3.4.3	Hardness, Durometer D (ISO 868/ASTM D 2240, 15 s dwell)	50 - 60	35 - 45

Date	Action	Revisions
2006 01 17	Revised	Inserted 3.0; Deleted 3.1, 3.2, 3.3, 3.7, 3.8 & 4
2000 02 15		Editorial – no technical change
1990 08 01	Released	EP00E01031538000

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ENGINEERING MATERIAL SPECIFICATION

WSK-M4D755-A1/A2

		A1	A2
3.4.4	Tensile Strength at Break, MPa, min (ISO R 527/ASTM D 638M, 150 min x 10 x 4.0 +/- 0.2 mm specimen, 50 mm/min test speed)	40	30
3.4.4.1	Elongation at Break, %, min (Test Method according to para 3.4.4)	350	450
3.4.5	Flexural Modulus, MPa, min (ISO 178/ASTM D 790M, Method I, Procedure A, 80 x 10 x 4.0 +/- 0.2 mm specimen, 64 mm support span)	100	30
3.4.6	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).	60 - 90	15 - 25
Additionally, a Shear Modulus vs. Temperature curve shall be plotted for -50 to +50 °C temperature range, at 5 °C minimum intervals. The plotted curve must be within tolerance range shown on pages 4 (-A1) and 5 (-A2).			
3.4.7	Impact Strength, Izod, kJ/m, min 2 (ISO 180, Method A/ASTM D 256, Method A, 63.5 x 10 x 4.0 +/- 0.2 mm specimen, 10 specimens for each test)		
3.4.7.1	At 23 +/- 2 °C	No break	No break
3.4.7.2	At -40 +/- 2 °C	3.5	80
3.4.7.3	At 10 +/- 2 °C	No break	No break
3.4.7.4	At -30 +/- 2 °C	3.7	No break
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.			
3.4.8	Heat Deflection Temperature, °C. min (ISO 75/ASTM D 648, 120 x 10 x 4.0 +/- 0.2 mm specimen. At 0.45 MPa)	40	45