



THERMOPLASTIC POLYURETHANE ELASTOMER (TPU)/ ACRYLONITRILE-BUTADIENE-STYRENE (ABS) MOLDING COMPOUND, EXTERIOR

WSS-M4D950-A1

1. SCOPE

The material defined by this specification is a blended thermoplastic polyurethane (TPU)/acrylonitrile-butadiene-styrene (ABS) injection molding compound.

2. APPLICATION

This specification was released originally for material used for exterior painted bodyside moldings applications.

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).

3.1.1 All requirements of this specification, identified by symbol (s), shall be met with data representing 3 sigma values.

3.4 MOLDING COMPOUND

(s) 3.4.1 Melt Flow Rate 4.0 - 11.0 g/10 minutes
(ISO 1133, 224 °C, 2.16 kg)

The material shall be dried for a minimum of 4 hours at 100 °C in a vacuum oven using full vacuum (25 - 30 mm Hg) immediately preceding the test.

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.

The following dimensions are required:

- A. 150 minimum x 10 x 4.0 ± 0.2 mm (ISO 3167, Type 1A)
- B. 120 x 10 x 4.0 ± 0.2 mm
- C. 355 x 100 x 1.27 ± 0.1 mm (ISO 3795)

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 1.08 - 1.10 g/cm³
(ISO 1183, Method A)

Date	Action	Revisions
2006 07 20	Revised	Inserted 3.0; Deleted 3.1, 3.2, 3.3, 3.7, 3.8 & 4
2000 03 30	Activated	



Documents

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(s)	3.5.3	Tensile Strength at Break, min (ISO 527-1 & ISO 527-2, 150 minimum x 10 x 4.0 +/- 0.2 mm specimen, test speed: 50 mm/minute)	23 MPa
(s)	3.5.3.1	Elongation at Break, min (Test Method according to para 3.5.3)	145%
(s)	3.5.4	Flexural Modulus, min (ISO 178, 80 x 10 x 4.0 +/- 0.2 mm specimen [use center section of specimen A or B], 2 mm/min test speed, 64 mm support span)	0.9 GPa
	3.5.5	Shear Modulus at 23 °C (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)	320 - 480 MPa

Additionally, a Shear Modulus vs. Temperature curve shall be plotted for -50 to +110 °C temperature range, at 5 °C minimum intervals. The plotted curve must be within tolerance range shown on page 4.

(s)	3.5.6	Impact Strength, Izod, min (ISO 180/1A, 80 x 10 x 4.0 +/- 0.2 mm specimen, 10 specimens for each test)	
	3.5.6.1	At 23 +/- 2 °C	63 kJ/m ²
	3.5.6.2	At -40 +/- 2 °C	9 kJ/m ²
	3.5.6.3	At -29 +/- 2 °C	42 kJ/m ²

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.

(s)	3.5.7	Heat Deflection Temperature, min (ISO 75-1 & ISO 75-2, 80 x 10 x 4.0 +/- 0.2 mm specimen [use center section of specimen A], flatwise, 0.34 +/- 0.1 mm deflection. At 1.80 MPa)	53 °C
	3.5.8	Vicat Softening Temperature, min (ISO 306, 10 x 10 x 4.0 +/- 0.2 mm specimens [use center section of specimen A]. Bath - silicone oil, temperature rise 50 +/- 5 °C/h. Dial gage reset to 'O' after addition of 5 kg weight. At 50 N load)	73 °C

