



POLYETHERSULFONE (PES), SE

WSK-M4D592-A

1. SCOPE

The material defined by this specification is a polyethersulfone molding compound. This material is self-extinguishing (SE) without flame retardant additives.

2. APPLICATION

This specification was released originally for material used for connectors in automatic transmissions.

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 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.

3.4.2	Density (ISO 1183, Method A)	1.35 - 1.39 g/cm ³
(s) 3.4.3	Tensile Strength at Yield, min (ISO R 527, 150 minimum x 10 x 4.0 +/- 0.2 mm specimen, 50 mm/min test speed,	86 MPa
(s) 3.4.4	Flexural Modulus, min (ISO 178, 80 x 10 x 4.0 +/- 0.2 mm specimen, 2 mm/min test speed, 64 mm support span)	2.0 GPa

Date	Action	Revisions
2005 08 15	Revised	Inserted 3.0; Deleted 3.1, 3.2, 3.3, 3.8, 3.9 & 4
1993 02 01	Revised	EP00E10258804000
1988 04 29	Released	SM/EQ3398 TP



- 3.4.5 Shear Modulus at 23 °C 0.8 - 1.0 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)

Additionally, a Shear Modulus versus Temperature curve shall be plotted for -50 to +220 °C temperature range, at 5 °C minimum intervals. The plotted curve must be within tolerance range shown on page 6.

- (s) 3.4.6 Impact Strength, Izod, min
(ISO 180/1A, 80 x 10 x 4.0 +/- 0.2 mm specimen, 10 specimens for each test)

3.4.6.1 At 23 +/- 2 °C 5.5 kJ/m²

3.4.6.2 At -40 +/- 1 °C 5 kJ/m²

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) 3.4.7 Heat Deflection Temperature, min 189 °C
(ISO 75, 120 x 10 x 4.0 +/- 0.2 mm specimen, 0.32 +/- 0.01 mm deflection. At 1.80 MPa)

- 3.4.8 Heat Aging Performance
(ISO 188, except 150 +/- 50 air changes/h, 1000 h at 200 +/- 2 °C. After heat aging test specimens are to be conditioned in a desiccator for 3 - 5 h at 23 +/- 2 °C. Unaged property values shall be determined at the time of the aged properties determination)

3.4.8.1 Tensile Strength at Max Load Change +/- 25%
(Test Method per para 3.4.3)

3.4.8.2 Impact Strength, Izod Change +/- 25%
(Test Method per para 3.4.6.1, specimens to be notched before heat aging)

3.5 FOGGING

(FLTM BO 116-03, 3 h at 100 °C)

Fog Number, min 90

Formation of clear film or droplets is cause for rejection.