



POLYPHENYLENE SULFIDE (PPS), 40% GLASS FIBER REINFORCED MOLDING COMPOUND

WSL-M4D807-A

1. SCOPE

The material defined by this specification is a very high heat resistant 40% glass fiber reinforced polyphenylene sulfide (PPS) molding compound.

2. APPLICATION

This specification was released originally for material used for high temperature, alcohol containing fuel valves.

3. REQUIREMENTS

3.1 APPROVED SOURCES

This specification requires the use of approved sources. Only the sources identified on the Ford Approved Source List (ASL) can be used when this specification is listed on the drawing, CAD file, or other documents. The list of approved sources is located within Ford at www.mats.ford.com or available externally through a Ford Materials Engineer.

3.2 CONDITIONING AND TEST CONDITIONS

All test values are based on material conditioned for not less than 24 h prior to testing in a controlled environment of 23 +/- 2 °C and 50 +/- 5% relative humidity. Testing of the material should occur in the conditioning environment or soon after removal.

3.3 INFRARED SPECTROPHOTOMETRY AND/OR THERMAL ANALYSIS

IR spectra and thermograms from initial material approval shall constitute the reference standard and shall be kept on file at the designated material laboratory. The material supplier shall ensure that all future material supplied to the specification shall produce IR spectra and thermograms that correspond to the reference standard when tested under the same conditions.

3.4 MOLDING COMPOUND

- | | | |
|-------|---|------------|
| 3.4.1 | Glass Fiber Content
(ISO 3451/1, Method A, 1 h at 825 +/- 50 °C) | 38 - 42% |
| 3.4.2 | Melt Temperature
(ISO 1218, Method B/ASTM D 789, or
DSC - ASTM E 794) | 275 °C min |

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	Rev 02
2017 10 04	Revised	See Summary of Revisions	G. Kowalski, NA
2006 03 17	Revised	Inserted 3.0; Deleted 3.1, 3.2, 3.3, 3.8, 3.9 & 4	
1991 04 20	Released	NL00E10149028	



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
(ISO 1183, Method A/ASTM D 792, Method A1) | 1.6 - 1.66 g/cm ³ |
| 3.5.3 | Tensile Strength at Break
(ISO R 527/ASTM D 638M, 150 min x 10 x 4.0 +/- 0.2 mm specimen, 5 mm/min test speed) | 144 MPa min |
| 3.5.4 | Flexural Modulus
(ISO 178/ASTM D 790M, Method I, Procedure A, 80 x 10 x 4.0 +/- 0.2 mm specimen, 64 mm support span) | 9.65 GPa min |
| 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) | 2.03 - 3.39 GPa |

Additionally, a Shear Modulus vs. Temperature curve shall be plotted for -50 to +250 °C temperature range, at 5 °C minimum intervals. The plotted curve must be within tolerance range shown on page 4.

- | | | |
|---------|--|---------------------------|
| 3.5.6 | Impact Strength, Izod
(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 | 6.0 kJ/m ² min |
| 3.5.6.2 | At -40 +/- 2 °C | 6.5 kJ/m ² min |

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
(ISO 75/ASTM D 648, 120 x 10 x 4.0 +/- 0.2 mm specimen. At 1.82 MPa) | 260 °C min |
| 3.5.8 | Heat Aging Performance
(ISO 188/ASTM D 573, 150 +/- 50 air changes/h, 1000 h at 220 +/- 2 °C. Unaged property values shall be determined at the time of the aged properties determination) | |
| 3.5.8.1 | Tensile Strength at Change
(Test Method per para 3.5.3) | -25% max |