



**POLYAMIDE (PA) 66, 25% GLASS FIBER REINFORCED, IMPACT MODIFIED,
INTERNALLY LUBRICATED (PTFE), HEAT STABILIZED, MOLDED
IN COLOR, MOLDING COMPOUND, INTERIOR**

WSS-M4D947-B1

1. SCOPE

The material defined by this specification is a 25% glass fiber reinforced, impact modified, internally lubricated with PTFE, heat stabilized, molded-in-color, UV stabilized molding compound based on polyamide 66 for interior applications.

2. APPLICATION

This specification was released originally for material used for molded in color F-series seatbelt height adjuster buttons where stiffness, toughness and low friction are required.

2.1 LIMITATIONS

- This material absorbs and retains moisture. Part design and tolerances must accommodate changes in part dimensions and physical properties due to moisture absorption or loss in the service/assembly environment.
- This material is internally lubricated and cannot be painted.

3. REQUIREMENTS

3.1 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 using latest ISO test methods.
- 3.1.2 This specification was developed using virgin material properties. The use of regrind is permitted, for economic / environmental reasons, with compliance as indicated in WSS-M99P1111-A.

Critical Process Parameters

At the request of Ford Materials Engineering the supplier shall be responsible to collect critical process control data on each lot of material produced. Testing required will be jointly developed between Ford Materials Engineering and the supplier based on CP and PFMEA review at the time of initial approval. Annually the supplier will review the in process data with Ford Materials Engineering to show that the process has remained under control. The data needs to be submitted in January for the previous calendar year. Data showing poor quality control measures or lack of submitted data may result in deletion from the Ford Approved Source List.

Date	Action	Revisions
2007 01 23	Activated	

Documents

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**3.2 MOLDING COMPOUND**

- (s) 3.2.1 Glass Fiber Content 23 - 27%
(ISO 3451/4, Method A, 600 +/- 25 °C)

3.3 MOLDED TEST SPECIMEN**3.3.1 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 527-2, specimen type 1A)
B. 60 x 60 x 2.0 +/- 0.1 mm (ISO/DIS 294-3)
C. 355 x 100 x 1.0 +/- 0.1 mm (ISO 3795)

Test specimen A shall be molded using molding conditions defined in ISO 1874-2. Specimens with shorter dimensions shall be cut from the center of the specimen A. No annealing allowed.

- 3.3.2 Density 1.26 - 1.35 g/cm³
(ISO 1183, Method A)

- (s) 3.3.3 Tensile Strength at Max Load, min 83 MPa
(ISO 527-1 & ISO 527-2, 150 minimum x 10 x 4.0 +/- 0.2 mm specimen A, test speed: 5 mm/minute)

- (s) 3.3.3.1 Tensile Elongation at Break, min. 3.0%
(per 3.3.3)

- 3.3.3.2 Tensile Stress/Strain Curves
(ISO 527-1, 527-2, ISO 11403-1; 150 x 10 x 4 mm specimen A).

Test speed: 5 mm/minute.

Provide a curve of tensile stress versus strain using one specimen per lot at each of the following temperatures: -40 °C, 23 °C and 80 °C. For ductile materials, the curve shall cover strain through yield point.

- (s) 3.3.4 Flexural Modulus, min 3800 MPa
(ISO 178, 80 x 10 x 4.0 +/- 0.2 mm specimen, 64 mm support span)

- (s) 3.3.5 Impact Strength, Izod, min
(ISO 180/1A, 63.5 x 10 x 4.0 +/- 0.2 mm specimen, 10 specimens for each test)

- 3.3.5.1 At 23 +/- 2 °C 5.4 kJ/m²

- 3.3.5.2 At -40 +/- 1 °C 4.5 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, if not possible, test can be conducted outside, but within 5 s.