Material Name

POLYAMIDE (PA) 46, HEAT STABILIZED,
OIL IMPREGNATED MOLDING COMPOUND

Specification Number

WSK-M4D811-A

1. SCOPE

The material defined by this specification is a polyamide 46 molding compound prepared by polycondensation of diaminobutane and adipic acid, oil impregnated and stabilized against hot air.

2. APPLICATION

This specification was released originally for material used for steering column bearings.

NOTICE: 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.

3. REQUIREMENTS

3.1 STATISTICAL PROCESS

Suppliers must conform to the requirements of Ford Quality System Standard Q-101. A mutually acceptable Control Plan as described therein is required for material/source approval. Appropriate statistical tools must be used to analyze process/product data so that variation in the final product is continuously reduced.

3.2 INFRARED SPECTROPHOTOMETRY AND/OR THERMAL ANALYSIS

Ford Motor Company, at its option, may conduct infrared and/or thermal analysis of material/parts supplied to this specification. The IR spectra and thermogram established for initial approval shall constitute the reference standard and shall be kept on file at the designated material laboratory. All samples shall produce IR spectra and thermograms that correspond to the reference standard when tested under the same conditions.

3.3 CONDITIONING AND TEST CONDITIONS

All test values indicated herein are based on material and specimens with moisture content not exceeding 0.2 % (test according to ISO 960, Method B/ASTM D 789).

All test materials immediately after processing have to be sealed in containers that are impermeable to water vapor. If the moisture content exceeds 0.2 %, condition the material for a minimum of 16 h at 40 - 50 C at a reduced pressure below 133 Pa.

Date	Release No.	Release/Revision
1991 07 01	EP00E01089486000	Released M. Siewert

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Conduct tests in a controlled atmosphere of 23 +/- 2 C and 50 +/- 5 % relative humidity. Individual specimens shall not be removed from closed containers until immediately before testing.

3.4 MOLDING COMPOUND

3.4.1	Melt Temperature (ISO 1218, Method B/ASTM D 789, or DSC - ASTM E 794)	287 - 295 C
3.4.2	Mineral Oil Content (FLTM AP 150-04, use pellet shavings as test material, solvent: 1,1,1 trichloroethane)	0.1 - 1.0 %

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 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)	1.26 - 1.31 g/cm3
3.5.3	Tensile Strength at Yield, min (ISO R 527/ASTM D 638M, 150 min x 10 x 4.0 +/- 0.2 mm specimen, 50 mm/min test speed)	70 MPa
3.5.3.1	Elongation at Yield, min (Test Method acc. to para 3.5.3)	4 %
3.5.4	Flexural Modulus, min (ISO 178/ASTM D 790M, Method I, Procedure A, 80 x 10 x 4.0 +/- 0.2 mm specimen, 64 mm support span)	2.3 GPa

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