GM	WORLDWIDE ENGINEERING STANDARDS	Material Specification	GMW16036

Polyamide 66 – Heat Stabilized, General Purpose

1 Scope

1.1 Material Description. This standard covers the properties of heat stabilized, general purpose polyamide 66 (nylon 66), which is used in injected form for molded components.

1.2 Symbols. The material abbreviation according to ISO 11469 is >PA66<.

1.3 Applicability. Typical applications include Connectors, Clips, and Trim Fasteners.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ASTM D6869	ISO 294	ISO 3146	ISO 15512
ISO 75	ISO 527	ISO 3795	
ISO 179/1eA	ISO 1183	ISO 11357-3	
ISO 188	ISO 1874-2	ISO 11469	

2.2 GM Standards/Specifications.

GMW3013	GMW3221	GMW3235	GMW16853
GMW3059	GMW3232	GMW14335	
GMW3205	GMW3235	GMW15634	

3 Requirements

3.1 Requirements on Delivery. Important physical, mechanical and thermal properties that characterize the material, are summarized in charts. The color shall be specified on drawings, in material specifications, and otherwise. Unless otherwise specified, injection molding of test specimens shall be accomplished per ISO 294 with the conditions for injection molding from ISO 1874-2.

3.1.1 All values indicated herein are based on material considered to be in the dry-as-molded state with moisture content of 0.2% maximum (ASTM D6869, ISO 15512, Method A or Method B, or GMW14335). Immediately after molding, specimens shall be sealed in moisture proof containers and stored at 22 °C ± 3 °C for at least 24 h prior to test as specified in ISO 1874-2.

3.1.1.1 All tests shall be performed on unannealed specimens immediately after their removal from the containers in a controlled atmosphere per GMW3221, Code A, unless otherwise specified. In addition, tests specified at temperatures below or above 22 °C ± 3 °C shall be conducted at the specified temperature using specimens conditioned at the specified temperature for 4 h minimum. The minimum values specified in the property tables must be met by test specimens in natural, black, or in a standard sampled color if natural or black are not available.

3.1.2 Compound Properties (Natural and Black). See Table 1. The following are also required for full standard approval. The minimum number of lots per test required is (1) one in natural:

- Poisson's Ratio.
- Coefficient of Linear Thermal Expansion (CLTE).
- Mold Shrinkage.
- Stress/Strain Curve at multiple temperatures (for example: 30 °C, 23 °C, 85 °C).

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- Viscosity Number.
- Differential Scanning Calorimetry (DSC) Curve.
- Infrared Spectroscopy Curve.

See GMW3013 for the test procedures and parameters.

3.2 Performance Requirements. Performance requirements shall be specified on part drawings or in component specifications.

Table 1: Compound Properties (Natural and Black)

Property	Standard	Units	Value
Moisture Content	ISO 15512 Method A or Method B	%	≤ 0.2
Density	ISO 1183	g/cm^3	Target Range 1.10 to 1.16
Tensile Modulus	ISO 527	MPa	2100 to 3900
Stress at Break	ISO 527	MPa	≥ 70
Stress at Break after Heat Aging	ISO 188 ISO 527 1000 h at 110 °C	% Retention	≥ 75
Notched Charpy Impact Strength at +23 °C at -30 °C	ISO 179/1eA	kJ/m^2	≥ 3.5 ≥ 2.0
Notched Charpy Impact Strength after Heat Aging	ISO 188 ISO 179/1eA 1000 h at 110 °C	% Retention	≥ 75
Melting Temperature	ISO 3146 or ISO 11357-3	°C	Target Range 255 to 265
Heat Deflection Temperature under Load 1.8 MPa	ISO 75	°C	≥ 60
Flammability	GMW3232 or ISO 3795 All reporting must be in accordance with GMW3232	mm/minute	≤ 100
Emission Testing of Interior Materials: For initial approval, test 1 lot in black.	GMW16853		
Odor	GMW3205-B3	Rating	≥ 6
Fogging	GMW3235-B-Y1-T2	mg	Requirements see GMW16853
Emissions	GMW15634 Volatile Organic Compound (VOC) Value Semi Volatile Organic Compound (SVOC) Value	µg/g µg/g	Requirements see GMW16853 Requirements see GMW16853

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