



Polypropylene – Natural Fiber Filled, Heat Stabilized

1 Scope

1.1 Material Description. This specification describes the properties of natural fiber filled, heat stabilized polypropylene, which are used in injected or extruded form for molded components.

1.2 Symbols. . The material abbreviations according to ISO 11469 are shown in Table 1.

1.3 Applicability. Typical applications include door trim carrier.

1.4 Remarks. The classification into groups is according to the different ranges of natural fiber content.

2 References

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

2.1 External Standards/Specifications.

ASTM D3012	ISO 179/1eU	ISO 527-1	ISO 3451-1
ISO 62	ISO 188	ISO 527-2	ISO 4577
ISO 75-1	ISO 294	ISO 1133	ISO 11359-2
ISO 75-2	ISO 294-3	ISO 1183	ISO 11469
ISO 179/1eA	ISO 294-4	ISO 1873-2	

2.2 GM Standards/Specifications.

GMW3013	GMW3221	GMW3259	GMW16853
GMW3059	GMW3232	GMW14270	
GMW3205	GMW3235	GMW15634	

3 Requirements

Materials approved to this specification shall meet the requirements of GMW3013, **General Requirements for Handling of Technical Terms of Delivery for Plastics.**

3.1 Requirements on Delivery.

3.1.1 Requirements on Test Specimens. Unless otherwise specified, injection molding of test specimens shall be accomplished per ISO 294 with the conditions for injection molding from ISO 1873-2. Test methods and specimen dimensions are also to be in accordance with ISO 1873-2 with the following additions:

- All tests shall be performed on specimens in a controlled atmosphere per GMW3221, Code A, unless otherwise specified.

The values specified in Table 1 shall be met by test specimens in natural, black or in a standard sampled color if natural or black are not available.

3.1.2 Chemical Requirements. All parts manufactured from molding compounds shall be resistant to the media they contact at their place of use.

3.2 Processing Requirements. Not applicable.

3.3 Performance Requirements. See Table 4. Additional performance requirements, e.g., flammability, fogging, or resistance to odor shall be specified on part drawings or in component specifications.

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

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

See GMW3013 for all test procedures and parameters.

Table 1: Compound Properties

Property	Test Method	Units	Nominal Percentage of Natural Fiber	
			20%	40%
ISO Symbol	ISO 11469	-	>PP-NF20<	>PP-NF40<
Ash (Natural Fiber)	ISO 3451-1 Method A at 650 °C Specify fiber type exclusive of carbon black	%	17 to 25	35 to 42
Density	ISO 1183	g/cm ³	Target Range 0.95 to 1.0	Target Range 1.03 to 1.08
Melt Volume Flow Rate (MVR) 230/5	ISO 1133	cm ³ /10 minutes	8 to 20	8 to 20
Tensile Modulus	ISO 527-1 ISO 527-2	MPa	2000 to 3200	3500 to 4600
Tensile Stress at Yield	ISO 527-1 ISO 527-2	MPa	≥ 26	≥ 34
Charpy Impact Strength • at +23 °C • at -30 °C	ISO 179/1eU	kJ/m ²	≥ 15 ≥ 5	≥ 15 ≥ 5
Charpy Notched Impact Strength • at +23 °C • at -30 °C	ISO 179/1eA	kJ/m ²	≥ 5 ≥ 2	≥ 5 ≥ 2
Tensile and Impact after Heat Aging	ISO 188 ISO 527-1 ISO 527-2	% Retention	≥ 75	
Temperature of Deflection Under Load • Heat Deflection Temperature (HDT) 0.45 MPa • HDT – 1.8 MPa	ISO 75-1 ISO 75-2	°C	≥ 120 ≥ 65	≥ 135 ≥ 70