



Polypropylene Homopolymer - General Purpose, Heat Stabilized

1 Scope

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose/Material Description. This specification covers the properties of unfilled general purpose polypropylene homopolymer, heat stabilized, injection-moldable compounds.

1.1.1 Types. The classification into groups is according to the different properties as described in Table 1.

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

1.3 Applicability. Typical applications include the following: Nonvisible and under hood components.

2 References

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

2.1 External Standards/Specifications.

ASTM D3012	ISO 188	ISO 527-2	ISO 11359-2
ASTM E831	ISO 294	ISO 1133	ISO 11469
ISO 75-1/2	ISO 527	ISO 1183	ISO 19069-2
ISO 179-1/1eA	ISO 527-1	ISO 3795	

2.2 GM Standards/Specifications.

GMW3013	GMW3221	GMW14270	GMW15634
GMW3059	GMW3232	GMW14444	GMW15725
GMW3205	GMW3235	GMW14650	GMW16853

2.3 Additional References.

Plastic Submission Template

3 Requirements

3.1 Requirements on Test Specimens. Materials approved to this specification shall meet the requirements of GMW3013.

Unless otherwise specified, injection molding of test specimens shall be accomplished per ISO 294 with the conditions for injection molding from ISO 19069-2. Test methods and specimen dimensions are also to be in accordance with ISO 19069-2 with the following additions:

- All tests shall be performed on specimens 40 h minimum after molding and immediately following a conditioning period of 24 h minimum in a controlled atmosphere per GMW3221, Code A, unless otherwise specified. All tests shall be performed on unannealed specimens.
- The values specified in Table 1 shall be met by test specimens in natural or black. For colored grades where other pigment and additive systems, e.g., stabilizer, are used, the impact values shall not decrease more than 10% from the specified minimum value.

3.2 Requirements on Delivery. Important physical, mechanical and thermal properties that characterize the material are summarized in Table 1. The color shall be specified on drawings, in material specifications and otherwise.

3.3 Compound Properties (Natural, Black and Integrally Colored). See Table 1. The following are also required for full approval. The minimum number of lots per test required is one unless otherwise specified. See the Polypropylene tab on the Plastic Submission Template (contact specification owning group named in Section 6 for access) and GMW3013 for test details and parameters.

- Poisson's Ratio
- Stress/strain data points and curves at the following temperatures: -30 °C, +23 °C, +85 °C, +110 °C

Note: See GMMPD tab on Plastic Submission Template for test details (contact specification owning group named in Section 6 for access).

- Coefficient of Linear Thermal Expansion (CLTE) data

Note: See GMMPD tab on Plastic Submission Template for test details (contact specification owning group named in Section 6 for access).

- Differential Scanning Calorimetry (DSC) curve
- Fourier Transform Infrared (FTIR) spectroscopy curve
- Mold shrinkage

3.4 Initial Source Approval. No shipments shall be made by any supplier until representative initial production samples have been approved by the appropriate Materials Engineering department(s) as meeting the requirements of this specification.

3.5 Chemical Requirements. All parts manufactured from molding compounds shall be resistant to the media contacted in the place of use.

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

- All finished parts for interior applications shall meet the requirements specified in GMW14444
- All finished parts for exterior applications shall meet the requirements specified in GMW14650
- All finished parts for under hood applications shall meet the requirements specified in GMW15725

3.7 All materials supplied to this standard must comply with GMW3059, **Restricted and Reportable Substances**, including the requirement to obtain a GM-approved International Material Data System (IMDS) submission.

Table 1: Compound Properties (Natural or Black)

Properties	Standard	Unit	Requirement
Density	ISO 1183, Method A	g/cm ³	Target Range 0.89 to 0.92
Melt Flow Rate (MFR) 230 °C/Load 2.16 kg	ISO 1133	g/10 minutes	Target Range 4 to 15
Tensile Modulus	ISO 527-1, ISO 527-2	MPa	950 to 1650
Tensile Strength at Yield	ISO 527-1, ISO 527-2	MPa	≥ 28
Tensile Strain at Yield	ISO 527-1, ISO 527-2	%	Report Results
Tensile Strength at Yield After Heat Aging ^{Note 1}	ISO 188, ISO 527-1, ISO 527-2	% Retention	≥ 85
Notched Charpy Impact Strength at +23 °C	ISO 179-1/1eA	kJ/m ²	≥ 4