GM	WORLDWIDE ENGINEERING STANDARDS	Material Specification	GMW16008

Polypropylene - Impact Copolymer, 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 describes the properties of injection moldable, medium impact Polypropylene (PP) copolymer, which is heat stabilized.

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

1.3 Applicability. Typical applications include the following: Wheelhouse liners.

1.4 Remarks.

1.4.1 Classification. The materials in this specification are categorized by melt flow rate.

2 References

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

2.1 External Standards/Specifications.

ASTM D3763	ISO 179-1/1eA	ISO 527-2	ISO 3795
ASTM E228	ISO 188	ISO 527-1/2	ISO 11359
ASTM E831	ISO 294	ISO 1133	ISO 11469
ISO 75	ISO 527-1	ISO 1183	ISO 19069-2

2.2 GM Standards/Specifications.

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

2.3 Additional References.

Plastic Submission Template

3 Requirements

Materials approved to this specification shall meet the requirements of GMW3013

3.1 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 19069-2. Test procedures 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, black or in a standard sampled color if natural or black are not available.

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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.

Note: For each product the requirements in Table 1 shall be documented by the Plastics Certification Template according to GMW3013. The color shall be specified on drawings, in material specifications and otherwise.

3.2 Emissions Testing of Interior Materials and Parts. For all Code E designated parts per GMW14444, reference GMW16853 for emissions testing of interior materials and parts.

3.3 Chemical Requirements. All parts manufactured from these materials shall be resistant to the media contacted at the place of use.

3.4 Compound Properties. See Table 1. The following tests are also required for full specification approval. The minimum number of lots per test required is one, in natural:

- Interior Emissions report per GMW16853.
- Poisson's Ratio.
- Stress Strain Curve at multiple temperatures: -30 °C, +23 °C, +85 °C. See GMMPD tab on Plastic Submission Template for test parameters (contact specification owning group named in Section 6 for access).
- Coefficient of Linear Thermal Expansion (CLTE) data. See GMMPD tab on Plastic Submission Template for test parameters (contact specification owning group named in Section 6 for access).
- Differential Scanning Calorimetry (DSC) Curve.
- Fourier Transform Infrared (FTIR) Spectroscopy Curve.
- Multiaxial Impact Curve.
- Mold Shrinkage.

See the Polypropylene tab on the Plastic Submission Template for the test procedures (contact specification owning group named in Section 6 for access).

3.5 Performance Requirements. Performance requirements shall be specified on part drawings, math data, or in component specifications.

- All finished parts for interior applications shall meet the requirements according to GMW14444.
- All finished parts for exterior applications shall meet the requirements according to GMW14650.
- All finished parts for underhood applications shall meet the requirements according to GMW15725.

3.6 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	Requirements	
			Type 1	Type 2
Density	ISO 1183, Method A	g/cm^3	0.88 to 0.91	
Melt Flow Rate Note1 MFR 230 °C/2.16 kg	ISO 1133	g/10 minutes	≥ 17	≥ 30
Tensile Modulus	ISO 527-1/2	MPa	≥ 800	
Tensile Strength at Yield	ISO 527-1/2	MPa	≥ 17	
Tensile Elongation at Yield	ISO 527-1/2	%	Report Value	

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