GM	WORLDWIDE ENGINEERING STANDARDS	Material Specification	GMW17257

Polypropylene Copolymer – 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, heat stabilized, injection moldable, general purpose polypropylene copolymer.

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/PE<.

1.3 Applicability. Typical applications include the following: Non-visible 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 1133	ISO 19069-2
ASTM E831	ISO 294	ISO 1183	
ISO 75-1/2	ISO 527-1	ISO 11359-2	
ISO 179-1/1eA	ISO 527-2	ISO 11469	

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

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 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 color. For integrally colored grades where other additive systems, e.g., stabilizer, are used, the impact values shall not decrease more than 10% from the specified minimum value.

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 Requirements on Delivery. Important physical, mechanical, and thermal properties that characterize the material are summarized in Table 1.

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

3.4 Compound Properties. See Table 1. The following are also required for full specification approval:

- Poisson's Ratio.
- Stress strain data and curves at multiple temperatures, -30 °C, +23 °C, +85 °C, 110 °C.
- Differential Scanning Calorimetry (DSC) Curve.
- 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.
- 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 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.

3.6 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	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 20 to 30
Tensile Modulus	ISO 527-1, ISO 527-2	MPa	800 to 1550
Tensile Strength at Yield	ISO 527-1, ISO 527-2	MPa	≥ 24
Tensile Elongation at Yield	ISO 527-1, ISO 527-2	%	Report Value
Tensile Strength at Yield After Heat Aging Note 1	ISO 527-1, ISO 527-2, 50 mm/minute test speed	% Retention	≥ 85
Notched Charpy Impact Strength at +23 °C	ISO 179-1/1eA	kJ/m^2	≥ 5
Notched Charpy Impact Strength at +23 °C after Heat Aging Note 1	ISO 179-1/1eA	% Retention	≥ 80
Mold Shrink, 48 h after molding, longitudinal	ISO 294, plaque size 101.6 mm × 152 mm × 3.2 mm	%	Target Range 1.2 to 1.8

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