



Interior Low Emissions Polyoxymethylene Homopolymer, Heat Stabilized, UV 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, low emission, heat stabilized, UV stabilized, unfilled polyoxymethylene (acetal) homopolymer that is used for interior components.

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

1.3 Applicability. Typical applications include interior buttons, handles, fasteners, speaker grilles, and other small components requiring Ultraviolet (UV) stability within the refreshable air space of the vehicle interior.

1.4 Remarks. The classification into groups is according to the different properties as described in Table 1 and Table 2. The following types apply to this specification:

- **H1:** Low Melt Flow
- **H2:** Medium Low Melt Flow
- **H3:** Medium High Melt Flow
- **H4:** High Melt Flow

2 References

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

2.1 External Standards/Specifications.

ASTM E831	ISO 188	ISO 1183	ISO 29988-2
ISO 75-1	ISO 294-3/4	ISO 3146	SAE J1545
ISO 75-2	ISO 527-1	ISO 3795	
ISO 179-1	ISO 527-2	ISO 11359-2	
ISO 179-1/1eA	ISO 1133	ISO 11469	

2.2 GM Standards/Specifications.

GMW3013	GMW3221	GMW14162	GMW15634
GMW3059	GMW3235	GMW14270	GMW15635
GMW3232	GMW3417	GMW14444	GMW16853

2.3 Additional References.

Plastic Submission Template

3 Requirements

3.1 Requirements on Test Specimens. Materials approved to this specification shall meet the standard requirements of GMW3013. Unless otherwise specified, injection molding of test specimens shall be accomplished per ISO 294-3/4, using the injection molding conditions specified in ISO 29988-2. Unless otherwise specified, test methods and specimen dimensions are also to be in accordance with GMW3013.

All tests shall be performed on unannealed specimens immediately following a conditioning period of 24 h minimum in a controlled atmosphere per GMW3221, Code A, unless otherwise specified. In addition, tests specified at temperatures below or above $+23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ shall be conditioned at the specified temperature for 4 h minimum and tested at the specified temperature. See the Acetal tab on the Plastics Submission Template for test details and parameters (contact specification owning group named in Section 6 for access).

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. The values specified in Table 2 shall be met by four (4) interior colors (black, gray, tan/neutral, and either red or blue) for approval to the specification and by test specimens in specific colors as required during color development. These test specimens may be produced using generic colorants in the four (4) colors or by specific colors required by a GM program.

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 their place of use.

Note: For each product, the requirements to Table 1 shall be documented by Certification Statement according to GMW3013.

3.4 Compound Properties. See Table 1 and Table 2. The following are also required for full specification approval. The minimum number of lots per test required is one:

- Interior Emissions report per GMW16853.
- Poisson's Ratio.
- Stress Strain Curve at multiple temperatures: $-30\text{ }^{\circ}\text{C}$, $+23\text{ }^{\circ}\text{C}$, $+85\text{ }^{\circ}\text{C}$, $+110\text{ }^{\circ}\text{C}$. 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. 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.

See the Acetal 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 according to GMW14444.

3.6 Requirements on Delivery. Important physical, mechanical, and thermal properties that characterize the material are summarized in Table 1 and Table 2.

Note: For each product the requirements to Table 1 and Table 2 shall be documented by the Plastic Submission Template (contact specification owning group named in Section 6 for access) according to GMW3013. The color shall be specified on drawings, in material specifications and otherwise.

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 and Black)

Property	Standard ^{Note 1}	Units	Types and Requirements			
			H1	H2	H3	H4
Melt Volume Rate (MVR): 190 °C/2.16 kg or Melt Flow Rate (MFR): 190 °C/2.16 kg	ISO 1133	g/10 minute	1 to 4	3 to 8	6 to 18	15 to 27
		or cm ³ /10 minute	1.2 to 4.8	3.6 to 9.6	7.2 to 21.6	18 to 34.4
Density	ISO 1183	g/cm ³	1.42 ± 0.03	1.42 ± 0.03	1.42 ± 0.03	1.42 ± 0.03
Tensile Modulus	ISO 527-1, ISO 527-2	MPa	2700 to 3700	2750 to 3800	2800 to 3800	2800 to 3600
Tensile Strength at Yield	ISO 527-1, ISO 527-2	MPa	65 to 77	65 to 77	65 to 77	65 to 77
Tensile Elongation at Yield	ISO 527-1, ISO 527-2	%	Report			
Charpy Notched Impact Strength at +23 °C	ISO 179-1/1eA	kJ/m ²	≥ 6	≥ 5	≥ 4	≥ 3
Charpy Notched Impact Strength at -30 °C	ISO 179-1/1eA	kJ/m ²	≥ 6	≥ 4	≥ 3	≥ 2
Tensile Strength after Heat Aging ^{Note 2} (report one lot)	ISO 527-1, ISO 527-2	% Retention	≥ 75			
Charpy Notched Impact Strength at +23 °C after Heat Aging ^{Note 2} (report one lot)	ISO 179-1/1eA	% Retention	≥ 75			
Heat Deflection Temperature (HDT): 1.8 MPa, Flatwise	ISO 75-1, ISO 75-2	°C	≥ 80	≥ 80	≥ 80	≥ 80
Melting Temperature	ISO 3146, Method A, Method B, Method C, 10 K/minute	°C	170 to 184			
Flammability (one lot only)	GMW3232 or ISO 3795 All reporting must be in accordance with GMW3232	mm/minute	≤ 100			