



Polyoxymethylene Copolymer

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.

This specification describes material types of unfilled, heat stabilized, polyoxymethylene copolymers, which are used in injected form for molded components.

1.1 Material Description. Additional characteristics will be indicated by code letters according to the respective specification number.

1.2 Symbols. >POM<.

1.3 Applicability. Clips, clamps, sliders.

1.4 Remarks. The classification into groups is according to the different ranges of viscosity.

2 References

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

2.1 External Standards/Specifications.

ISO 75	ISO 527-1	ISO 3146	ISO 9988-2
ISO 179/1eA	ISO 527-2	ISO 3167	SAE J1976
ISO 188	ISO 1133	ISO 4892-1	SAE J2527
ISO 294	ISO 1183	ISO 4892-2	

2.2 GM Standards/Specifications.

GMW3013	GMW3059	GMW3221	GMW16924
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3 Requirements

Materials approved to this specification shall meet the standard requirements GMW3013.

3.1 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.

3.2 Requirements on Test Specimens. Reference GMW3221. Unless otherwise specified, injection molding of test specimens shall be accomplished per ISO 294 with the conditions for injection molding from ISO 9988-2. Unless otherwise specified, test methods and specimen dimensions are 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 °C shall be conditioned at the specified temperature for 4 h minimum and tested at the specified temperature.

3.2.1 Compound Properties (Natural, Black and Integrally Colored). The following are also required for full standard approval. The minimum number of lots per test required is one (1) in natural:

- Poisson's Ratio, Coefficient of Linear Thermal Expansion (CLTE)
- Mold Shrinkage, Stress Strain Curve at multiple temperatures (for example: -30 °C, +23 °C, +85 °C)
- Shear Modulus Curve
- Differential Scanning Calorimetry (DSC) Curve
- Infrared Spectroscopy Curve. See GMW3013 for the test procedures.

3.3 Chemical Requirements. All parts manufactured from molding compounds shall be resistant to the media they contact, such as aliphatic and aromatic hydrocarbons, fuels, lubricants, oils, greases and alcohols, at their places of use.

3.4 Compound Requirements. See Table 1.

Table 1: Compound Properties

Properties	Test	Unit	C1	C2	C3	C4	C5	C2P1	C2P2	C4P1	C4P2
Tensile Modulus	ISO 527-1, ISO 527-2, Specimen ISO 3167, 4 mm thick Type A bar, Test Speed 1 mm/minute; between 0.05% to 0.25% Strain	MPa	2200 to 3100	2000 to 3200	2200 to 3400	2300 to 3000	2500 to 3300	1800 to 2700	1400 to 2000	1600 to 2600	1300 to 2100
Stress at Yield	ISO 527-1, ISO 527-2, Specimen ISO 3167, 4 mm thick Type A bar, Test Speed 50 mm/minute	MPa	≥ 56	≥ 56	≥ 56	≥ 58	≥ 60	≥ 46	≥ 38	≥ 42	≥ 38
Stress at Yield after Heat Aging	ISO 527-1, ISO 527-2, Specimen ISO 3167, 4 mm thick Type A bar, Test Speed 50 mm/minute	MPa	After heat aging 1000 h ± 5 h at +110 °C ± 3 °C for groups C1, C2, C3, C4 and C5 or 1000 h ± 5 h at +90 °C ± 3 °C for the polymer modified groups C1P2a, C2P1, C2PA, C4P1, and C4P2 according to ISO 188 Method A (air oven method) shall have retention ≥ 75% relative to unaged specimens tested concurrently.								
Strain at Yield	ISO 527-1, ISO 527-2, Specimen ISO 3167, 4 mm thick Type A bar, Test Speed 50 mm/minute	%	≥ 7	≥ 6	≥ 5	≥ 4	≥ 4	≥ 8	≥ 10	≥ 6	≥ 7
Charpy Notched Impact Strength at +23 °C	ISO 179/1eA, Specimen Machined V-notch, radius = 0.25 mm, 80 mm × 10 mm × 4 mm	kJ/m ²	≥ 5	≥ 4	≥ 3	≥ 3	≥ 3	≥ 7	≥ 8	≥ 4	≥ 7
Charpy Notched Impact Strength at -30 °C	ISO 179/1eA, Specimen Machined V-notch, radius = 0.25 mm, 80 mm × 10 mm × 4 mm	kJ/m ²	≥ 4	≥ 3	≥ 2	≥ 2	≥ 2	≥ 4	≥ 4	≥ 3	≥ 4
Charpy Notched Impact Strength after Heat Aging	ISO 179/1eA, Specimen Machined V-notch, radius = 0.25 mm, 80 mm × 10 mm × 4 mm	kJ/m ²	After heat aging 1000 h ± 5 h at +110 °C ± 3 °C for groups C1, C2, C3, C4 and C5 or 1000 h ± 5 h at +90 °C ± 3 °C for the polymer modified groups C1P2a, C2P1, C2PA, C4P1, and C4P2 according to ISO 188 Method A (air oven method) shall have retention ≥ 75% relative to unaged specimens tested concurrently.								