GM	WORLDWIDE ENGINEERING STANDARDS	**Material Specification**	**GMW22**

Polyoxymethylene 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 heat stabilized, unfilled polyoxymethylene (acetal) copolymer that is used in injected form for molded components.

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

1.3 Applicability. Clips, clamps, and sliders that are not located within the refreshable air space of the vehicle interior.

1.4 Remarks. The classification into groups is according to the different ranges of viscosity. The following types apply to this specification:

- **C1:** Low Melt Flow
- **C2:** Medium Low Melt Flow
- **C3:** Medium High Melt Flow
- **C4:** High Melt Flow
- **C5:** Very High Melt Flow
- **C2P1:** Medium Low Melt Flow, Polymer Modified for Improved Impact
- **C2P2:** Medium Low Melt Flow, Highly Polymer Modified for Improved Impact
- **C4P1:** High Melt Flow, Polymer Modified for Improved Impact
- **C4P2**: High Melt Flow, Highly Polymer Modified for Improved Impact

2 References

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

2.1 External Standards/Specifications.

ISO 75-1	ISO 188	ISO 527-2	ISO 3146
ISO 75-2	ISO 294-1	ISO 1133	ISO 11469
ISO 179-1/1eA	ISO 527-1	ISO 1183-1	ISO 29988-2

2.2 GM Standards/Specifications.

GMW3013	GMW3059	GMW3221	GMW14270

2.3 Additional References.

- Plastic Submission Template

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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 294-1 with the conditions for injection molding from ISO 29988-2. 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 ± 2 °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 and GMW3013 for test details and parameters.

The values specified in Table 1 shall be met by test specimens in natural, black, or in a standard sampled color if natural and black are not available.

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

3.3 Compound Properties (Natural, Black and Integrally Colored). See Table 1. The following are also required for full specification approval. The minimum number of lots per test required is one (1):

- Poisson's Ratio.
- Stress Strain Curve at multiple temperatures: -30 °C, +23 °C, +85 °C, +110 °C.

  Note: See GM Material Property Database (GMMPD) tab on Plastics 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 Plastics Submission Template for test details (contact specification owning group named in Section 6 for access).
- Differential Scanning Calorimetry (DSC) Curve.
- Fourier Transform Infrared Spectroscopy (FTIR) Curve.
- Mold Shrinkage.

  Note: See the Acetal tab on the Plastic Submission Template for the test procedures.

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

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

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 and Black)

Properties	Standard Note 1	Unit	C1	C2	C3	C4	C5	C2P1	C2P2	C4P1	C4P2
Melt Volume Rate (MVR) 190 °C/2.16 kg Or Melt Flow Rate (MFR) 190 °C/2.16 kg	ISO 1133	cm^3/10 minute or g/10 minute	1 to 4	4 to 11	8 to 15	15 to 30	28 to 52	4 to 10	4 to 10	16 to 28	16 to 28
			1 to 5	5 to 14	9 to 18	19 to 32	32 to 60	5 to 12	5 to 12	18 to 33	18 to 33
Density	ISO 1183-1	g/cm^3	1.38 to 1.44	1.38 to 1.44	1.38 to 1.44	1.38 to 1.44	1.38 to 1.44	1.35 to 1.41	1.33 to 1.39	1.36 to 1.42	1.34 to 1.40

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