GM	WORLDWIDE ENGINEERING STANDARDS	Material Specification	GMW17195

Polyoxymethylene Copolymer - Stainless Steel Fiber Filled, Electrostatically Dissipative, Fuel Compatible

1 Scope

1.1 Material Description. This specification covers the properties of a stainless steel fiber filled, pellet formed, injection moldable, fuel resistant polyoxymethylene (acetal) copolymer.

1.2 Symbols. All plastic parts must have legible plastic compound identification symbol per GMW3116 and ISO 11469 requirements. >POM-MF(Fe)7<.

1.3 Applicability. Typical applications include fuel pump system components requiring electrostatically dissipative properties, e.g., fuel ports, filter housings, inlet check valves, etc.

1.4 Remarks. This specification is classified by type of fuel approved for use as follows:

- **T1:** Gasoline Compatible
- **T2:** Gasoline and Biodiesel Compatible

2 References

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

2.1 External Standards/Specifications.

ASTM E831	ISO 294-3/4	ISO 3146	ISO 29988-2
IEC 60093	ISO 527-1/2	ISO 3167	SAE J1645
ISO 75-1/2	ISO 1133	ISO 3451-1	SAE J1681
ISO 179/1eA	ISO 1183	ISO 11359-2	
ISO 188	ISO 1817	ISO 11469	

2.2 GM Standards/Specifications.

GMW3013	GMW3116	GMW3221	GMW14270
GMW3059			

2.3 Additional References.

- B20 Biodiesel: 20% Soy Methyl Ester (SME) bio content (GMPT-5-020) available from Gage Products at http://www.gageproducts.com/index.html
- CE10 Gasoline: Fuel C with 10% bioethanol content (SAE J1681)
- CM15A Gasoline: Fuel C with 15% methanol content, aggressive (SAE J1681)

3 Requirements

3.1 Requirements on Test Specimens. Reference GMW3221. Unless otherwise specified, injection molding of test specimens shall be accomplished per ISO 294-3/4 with the conditions for injection molding from 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 °C shall be conditioned at the specified temperature for 4 h minimum and tested at the specified temperature.

The values specified in Table 1 shall be met by test specimens in natural, black, or integrally colored.

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3.2 Chemical Requirements. All parts manufactured from molding compounds shall be resistant to the media contacted at the place of use, including fuel.

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

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

- Electronically supplied Stress Strain Curve at multiple temperatures, e.g., +23 °C, +85 °C, -30 °C and after 1000 h of fuel soak
- Differential Scanning Calorimetry Curve
- Shear Modulus Curve
- Infrared Spectroscopy Curve

3.4 Swell after Fuel Soak. On a standard tensile bar, measure length, width, and thickness at center of gauge length prior to start of test. Measure length, width, and thickness again at center of gauge length after 1000 h fuel soak. Calculate percent change in each direction:

$$\frac{d_1 - d_2}{d_1}$$

Where:

d_1 is original measurement.

d_2 is measurement after soak.

3.5 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.

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

Table 1: Compound Properties

Property	Standard [Note 1]	Units	T1 Requirement	T2 Requirement
Density	ISO 1183, Method A	g/cm^3	1.44 to 1.51	1.45 to 1.55
Ash	ISO 3451-1 Method A	%	7 ± 2	8 ± 2
Tensile Modulus	ISO 527-1/2, Specimen ISO 3167	MPa	≥ 2200	≥ 2400
Tensile Strength at Yield	ISO 527-1/2, Specimen ISO 3167	MPa	54 to 70	51 to 66
Tensile Elongation at Break	ISO 527-1/2, Specimen ISO 3167	MPa	Report	Report
Poisson's Ratio	ISO 527-1/2 Specimen ISO 3167	No units	Report	Report
Charpy Notched Impact Strength at +23 °C	ISO 179/1eA, Specimen Machined V-notch	kJ/m^2	≥ 2	≥ 2
Charpy Notched Impact Strength at -30 °C	ISO 179/1eA, Specimen Machined V-notch	kJ/m^2	Report one lot	Report one lot

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