GM	WORLDWIDE ENGINEERING STANDARDS	**Material Specification**	**GMW17730**

Polyethylene – High Density, Injection Molding Grade

1 Scope

1.1 Material Description. This specification covers the properties of high density polyethylene, injection molding grade compound.

1.2 Symbols. The material abbreviation according to ISO 11469 is >PE-HD<.

1.3 Applicability. Typical applications include headrest and seat internal components.

2 References

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

2.1 External Standards/Specifications.

ISO 179	ISO 306	ISO 1183	ISO 11469
ISO 188	ISO 527	ISO 1872-2	
ISO 294	ISO 1133	ISO 3795	

2.2 GM Standards/Specifications.

GMW3013	GMW3221	GMW14270	GMW16853
GMW3059	GMW3232	GMW14444	
GMW3205	GMW3235	GMW15634	

3 Requirements

Materials approved to this specification shall meet the requirements of GMW3013, **General Requirements for Handling of Technical Terms of Delivery for Plastics.**

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 1872-2. Test methods and specimen dimensions are also to be in accordance with ISO 1872-2 unless otherwise specified.

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.

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 Compound Properties. See Table 1. The following are also required for full standard approval. The minimum number of lots per test required for the following properties is one 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). See GMW3013 for all test procedures and parameters.

3.4 Performance Requirements. Performance requirements shall be specified on part drawings or in component specifications. All parts manufactured from molding compounds shall be resistant to the media the parts contact, such as aliphatic and aromatic hydrocarbons, fuels, lubricants, oils, greases and alcohols, at their places of use.

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Table 1 Compound Properties (Natural or Black)

Property	Standard	Units	Value
Density	ISO 1183	g/cm^3	Target Range 0.94 to 0.98
Melt Flow Rate	ISO 1133 2.15 kg, +190 °C	g/10 minutes	7.0 to 11.0
Tensile Modulus	ISO 527 1 mm/minute	MPa	550 to 1050
Tensile Stress at Yield	ISO 527 50 mm/minute	MPa	≥ 20
Tensile Elongation at Yield	ISO 527 50 mm/minute	%	≥ 8.5
Tensile Stress at Break	ISO 527 50 mm/minute	MPa	≥ 23
Tensile Elongation at Break	ISO 527 50 mm/minute	%	≥ 300
Tensile Stress at Yield after Heat Aging	ISO 188, ISO 527 1000 h at +90 °C	% Retention	≥ 90
Vicat Softening Point	ISO 306 +50 °C/h, 10N	°C	≥ 55
Notched Charpy Impact Strength At +23 °C At -30 °C	ISO 179/1eA	kJ/m^2	 ≥ 6 ≥ 4
Flammability	GMW3232 or ISO 3795 All reporting must be in accordance with GMW3232	mm/minute	SE or ≤ 100
Emission Testing of Interior Materials: For initial approval, test 1 lot in black.	GMW16853		
- Odor	GMW3205-B3	Rating	≥6
- Fogging	GMW3235-B-Y1-T2	mg	Requirements see GMW16853
- Emissions	GMW15634 VOC Value SVOC Value	 µg/g µg/g	 Requirements see GMW16853 Requirements see GMW16853

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.

4 Manufacturing Process

Not applicable.

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