GM	WORLDWIDE ENGINEERING STANDARDS	Material Specification	GMW16720

Polyethylene – Linear Ultra High Molecular Weight, Ram Extrusion

1 Scope

1.1 Material Description. This specification covers the properties of an ultra high molecular weight (UHMW), polyethylene, ram extruded with extremely low coefficient of friction.

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

1.3 Applicability. Typical applications include windshield glass run channel.

2 References

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

2.1 External Standards/Specifications.

ISO 306	ISO 527-2	ISO 1628-3	ISO 11469
ISO 527-1	ISO 1183	ISO 1872-2	

2.2 GM Standards/Specifications.

GMW3013	GMW3059	GMW3221	GMW14270

3 Requirements

3.1 Requirements on Test Specimens. Unless otherwise specified, compression molding of test specimens shall be accomplished per ISO 1872-2. Test methods and specimen dimensions are also to be in accordance with ISO 1872-2. 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.

3.1.1 Chemical Requirements. All parts manufactured from molding compounds shall be resistant to the media they contact at their place of use.

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

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

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

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Table 1: Compound Properties (Natural)

Property	Standard Note 1	Units	Value
Density	ISO 1183/A	g/cm^3	Target Range 0.93 ± 0.005
Intrinsic Viscosity	ISO 1628-3	dl/g	Target Range 30 ± 4
Tensile Strength at Break	ISO 527-1, ISO 527-2	MPa	34 to 46
Tensile Strain at Break	ISO 527-1, ISO 527-2	%	≥ 275
Tensile Modulus	ISO 527-1, ISO 527-2	MPa	≥ 545
Vicat Softening Temperature	ISO 306	°C	≥ 75

Note 1: Standard test specimen and test setup should follow GMW3013.

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

- Poisson's Ratio
- Stress/Strain Curve at +23 °C

See GMW3013 for the test procedures.

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

3.6 All materials supplied to this standard must comply with GMW3059, **Restricted and Reportable Substances**, including the requirement to submit a full material composition disclosure to GM via the International Material Data System (IMDS) or via a completed GMW3059 report form.

4 Manufacturing Process

Not applicable.

5 Rules and Regulations

5.1 Legal Regulations. All materials must satisfy applicable laws, rules, regulations and recommendations valid in the country of usage.

5.2 Language. In the event of conflict between the English and domestic language, the English language shall take precedence.

5.3 Inspection and Rejection. Samples of components or materials released to a GM material specification shall be tested for conformity with the requirements of this material specification and approved by the responsible Engineering department prior to commencement of delivery of bulk supplies.

A new approval must be received for any changes, e.g., properties, manufacturing process, location of manufacture, etc. If not otherwise agreed, all testing and documentation normally required for initial release must be completed.

It is the responsibility of the supplier to inform the customer in a timely manner, without solicitation, and to include documentation of all modifications of materials and/or processes and to apply for a new release.

5.4 Material Safety Data Sheets/Safety Data Sheets (MSDS/SDS). For new product submissions, or when a change in chemical composition of an existing product has occurred, a complete copy of the Material Safety Data Sheet/Safety Data Sheet must be submitted in compliance with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) requirements or other country-specific MSDS/SDS requirements.

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