



Acrylonitrile Styrene Acrylate or Acrylonitrile Styrene Acrylate and Polycarbonate Blend - UV-Stabilized or Weatherable - Metallic

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 material types of unfilled Acrylonitrile Styrene Acrylate (ASA) and Polycarbonate (PC) blends that are used in injection components for mold in color metallic appearance.

1.2 Symbols. The material abbreviation according to ISO 11469 is shown in Table 1.

1.1.1 Types. The classification into groups is according to the different properties as described in Table 1, Table 2 and Table 3.

1.3 Applicability. Typical applications include interior and exterior decorative trim not requiring significant impact resistance.

1.4 Remarks. Mold in color metallic resins can be difficult at weld lines, consideration must be taken during design for successful applications.

2 References

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

2.1 External Standards/Specifications.

ASTM D955	ISO 294	ISO 527-2	ISO 19062-2
ASTM E831	ISO 294-3	ISO 1183	SAE J1545
ISO 75-1	ISO 294-4	ISO 3167	SAE J1885
ISO 75-2	ISO 306	ISO 3795	SAE J1976
ISO 179-1/1eA	ISO 527	ISO 11359-2	SAE J2527-A
ISO 188	ISO 527-1	ISO 11469	

2.2 GM Standards/Specifications.

GMW3013	GMW3232	GMW14270	GMW15634
GMW3059	GMW3235	GMW14334	GMW16853
GMW3205	GMW3417	GMW14444	
GMW3221	GMW14162	GMW14650	

2.3 Additional References.

- Number 7 Car Wash Concentrate, Armor All Products, Aliso Viejo, CA 92656
- Plastic Submission Template

3 Requirements

3.1 Requirements on Test Specimens. Materials approved to this specification shall meet the requirements of GMW3013. Unless otherwise specified, injection molding of test specimens shall be accomplished per ISO 294 with the conditions for injection molding from ISO 19062-2. Test methods and specimen dimensions are also to

be in accordance with ISO 19062-2 with the following additions: Use ISO 3167, Type 1A, Thickness 4 mm, for tensile and flexural properties.

All tests shall be performed on specimens for 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 metallic, or integrally colored metallic. Each color will require complete Table 2 testing.

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 Requirements on Delivery. Important physical, mechanical and thermal properties that characterize the material are summarized in Table 1 and Table 2.

Note: For each product, the requirements to Table 1 and Table 2 shall be documented by Certification Statement according to GMW3013. The color shall be specified on drawings, in material specifications and otherwise.

3.4 Compound Properties. See Table 1 and Table 2. The following are also required for full approval. The minimum number of lots per test required is one unless otherwise specified. See the Styrenics tab on the Plastic Submission Template (contact specification owning group named in Section 6 for access) and GMW3013 for test details and parameters.

- Poisson's Ratio.
- Stress/strain data points and curves at the following temperatures: -30 °C, +23 °C, +85 °C.

Note: See GMMPD tab on Plastic 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 Plastic Submission Template for test details (contact specification owning group named in Section 6 for access).

- Differential Scanning Calorimetry (DSC) curve.
- Fourier Transform Infrared (FTIR) spectroscopy curve.
- Mold shrinkage.

3.5 Initial Source Approval. No shipments shall be made by any supplier until representative initial production samples have been approved by the appropriate Materials Engineering department(s) as meeting the requirements of this specification.

3.6 Performance Requirements. Performance requirements, e.g., flammability, fogging or resistance to odor, shall be specified on part drawings or in component specifications.

All finished parts for interior applications shall meet the requirements according to GMW14444.

All finished parts for exterior applications shall meet the requirements according to GMW14650.

All parts manufactured from molding compounds shall be resistant to the media contacted at the place of use.

3.7 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)

Property	Standard ^{Note 1}	Units	T1	T2	T3	T4
International Organization for Standardization (ISO) Symbol	ISO 11469	-	>ASA<	>ASA<	>ASA+PC<	>ASA+PC<
Density	ISO 1183, Method A	g/cm ³	1.09 ± 0.10	1.09 ± 0.10	1.14 ± 0.10	1.14 ± 0.10

Property	Standard ^{Note 1}	Units	T1	T2	T3	T4
Tensile Modulus	ISO 527-1 ISO 527-2	MPa	≥ 1900	≥ 1900	≥ 2000	≥ 2000
Tensile Elongation at Yield/Break	ISO 527-1/2	% minimum	Report	Report	Report	Report
Tensile Stress at Yield/Break	ISO 527-1 ISO 527-2	MPa	≥ 30	≥ 30	≥ 40	≥ 40
Poisson's Ratio (one lot only)	ISO 527-1 ISO 527-2	-	Report	Report	Report	Report
Charpy Notched Impact Strength at +23 °C	ISO 179-1/1eA	kJ/m ²	≥ 4	≥ 4	≥ 8	≥ 8
Heat Deflection Temperature (HDT) 1.8 MPa, flatwise	ISO 75-1 ISO 75-2	°C	≥ 70	≥ 70	≥ 85	≥ 85
Vicat Softening Temperature	ISO 306	°C	≥ 88	≥ 85	≥ 95	≥ 95
Tensile Strength after Heat Aging ^{Note 2} 1000 h (report one lot)	ISO 527-1 ISO 527-2	% Retention	≥ 80 age at 80 °C for ASA and 90 °C for ASA+PC			
Tensile Strain after Heat Aging ^{Note 2} 1000 h (report one lot)	ISO 527-1 ISO 527-2	% Retention	≥ 80 age at 80 °C for ASA and 90 °C for ASA+PC			
Flammability 2 mm thickness plaque (report one lot)	GMW3232 or ISO 3795 All reporting must be in accordance with GMW3232	mm/minute	Not required	≤ 100	Not required	≤ 100
Emission Testing of Interior Materials (Fogging, Odor, Emissions, Carbonyls, Amines).	GMW16853	-	-			
Emissions	GMW15634 Volatile Organic Compound (VOC) value and Semi Volatile Organic Compound (SVOC) value	µg/g	Not required	See requirements of GMW16853	Not required	See requirements of GMW16853
Odor	GMW3205	Rating	Not required	See requirements of GMW16853	Not required	See requirements of GMW16853