



Acrylonitrile Butadiene Styrene and Polycarbonate Blend, Unfilled

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 Material Description. This specification describes material types of unfilled acrylonitrile plastic, abs, styrene, styrenic, butadiene, acrylonitrile, polycarbonate styrene and polycarbonate blends, which are used in injection components.

1.1.1 Paintability. Approved paint systems that can be used on this material are listed, e.g., in the General Motors Approved Paint on Parts Systems (GM APOPS) database.

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

1.2 Symbols. The material abbreviation according to ISO 11469 is >ABS+PC<.

1.3 Applicability. Typical applications include exterior and interior substrates that require high temperature stability and low temperature ductility.

1.4 Remarks. Not applicable.

2 References

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

2.1 External Standards/Specifications.

ASTM D955	ISO 179-1eA	ISO 527-2	ISO 3795
ASTM D3763	ISO 294-3	ISO 1133	ISO 6603-2
ASTM E831	ISO 294-4	ISO 1183	ISO 11359-2
ISO 75-1	ISO 306	ISO 2580-2	ISO 11469
ISO 75-2	ISO 527-1	ISO 3167	SAE J1885

2.2 GM Standards/Specifications.

GMW3013	GMW3232	GMW14334	GMW15634
GMW3059	GMW3235	GMW14444	GMW16853
GMW3205	GMW3417	GMW14650	
GMW3221	GMW14162	GMW14668	

2.3 Additional References.

Not applicable.

3 Requirements

3.1 Requirements on Test Specimens.

Reference GMW3221.

3.1.1 Unless otherwise specified, injection molding of test specimens shall be accomplished per ISO 294-3 and ISO 294-4 with the conditions for injection molding from ISO 2580-2.

3.1.2 Test methods and specimen dimensions are also to be in accordance with ISO 2580-2 with the following additions: Use ISO 3167, Type 1A, thickness 4 mm, for tensile and flexural properties.

3.1.3 All tests shall be performed on specimen 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.

3.1.4 All tests shall be performed on unannealed specimen.

3.1.5 The values specified in Table 1 shall be met by a test specimen in natural or black.

3.1.6 The values specified in Table 2 shall be met by an integrally colored test specimen.

3.1.7 For integrally colored grades where other additive systems (e.g., stabilizer) are used, the impact values shall not decrease more than 10% from the specified minimum value.

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

3.4 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 a Certification Statement according to GMW3013. The color shall be specified on drawings, in material specifications and otherwise.

3.5 Compound Properties. For compound property requirements natural, black and integrally colored, see Tables 1 and 2. The following is also required for full specification approval.

The minimum number of lots per test required is one in natural: Stress Strain Curve at +23 °C, +85 °C, -30 °C; Multiaxial Impact Curve.

3.6 Performance Requirements.

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

3.6.2 All finished parts for interior applications shall meet the requirements according to GMW14444. This shall be noted on the Certification Statement with Code Letter U.

3.6.3 All finished parts for exterior applications shall meet the requirements according to GMW14650. This shall be noted on the Certification Statement with Code Letter L.

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

Table 1: Compound Property Requirements (Natural and Black)

Property	Standard Note 1	Units	T1	T2	T3	T4	T5	T6	T7
Tensile Modulus	ISO 527-1, ISO 527-2	MPa	≥ 1700	≥ 1800	≥ 1900	≥ 1700	≥ 1800	≥ 1800	≥ 1700
Tensile Strength @ Yield	ISO 527-1, ISO 527-2	MPa	≥ 40	≥ 45	≥ 45	≥ 40	≥ 45	≥ 49	≥ 40
Tensile Strain @ Break	ISO 527-1, ISO 527-2	%	Report	Report	Report	Report	Report	Report	Report
Poisson's Ratio (one lot)	ISO 527-1, ISO 527-2	NA	Report	Report	Report	Report	Report	Report	Report
Charpy Notched Impact Strength @ +23 °C	ISO 179-1eA	kJ/m ²	≥ 20	≥ 30	≥ 35	≥ 20	≥ 25	≥ 30	≥ 20
Charpy Notched Impact Strength @ -30 °C	ISO 179-1eA	kJ/m ²	≥ 10	≥ 15	≥ 15	≥ 10	≥ 10	≥ 12	≥ 10

Property	Standard Note 1	Units	T1	T2	T3	T4	T5	T6	T7
Density	ISO 1183 method A	g/cm ³	1.13 ± 0.09	1.12 ± 0.04	1.15 ± 0.04	1.11 ± 0.04	1.12 ± 0.04	1.15 ± 0.04	1.11 ± 0.04
Melt Mass Flow Rate or Melt Volume Flow Rate 260 °C/5 kg	ISO 1133	cm ³ /10 minutes or g/10 minutes	Report	Report	Report	> 12	> 12	> 12	Report
Mold Shrink – Flow Direction (report one lot)	ISO 294-3, ISO 294-4 or ASTM D955	%	0.6 – reported in specification as nominal target, actual shrink dependent upon wall thickness, flow distance, etc. – exact shrink must be determined on a tool-by-tool basis.						
Mold Shrink – Cross Flow Direction (report one lot)	ISO 294-3, ISO 294-4 or ASTM D955	%	0.6 – reported in specification as nominal target, actual shrink dependent upon wall thickness, flow distance, etc. – exact shrink must be determined on a tool by tool basis.						
HDT – 1.8 MPa	ISO 75-1, ISO 75-2	°C	≥ 80	≥ 88	≥ 100	≥ 80	≥ 90	≥ 100	≥ 85
Vicat	ISO 306	°C	≥ 100	≥ 110	≥ 120	≥ 100	≥ 110	≥ 120	≥ 105
CLTE – Flow Direction (report one lot)	ASTM E831 or ISO 11359-2	10 ⁻⁶ mm/(mm*K)	≤ 90 x 10 ⁻⁶ – report one lot						
CLTE – Cross Flow Direction (report one lot)	ASTM E831 or ISO 11359-2	10 ⁻⁶ mm/(mm*K)	≤ 90 x 10 ⁻⁶ – report one lot						
Multiaxial Impact Strength @ +23 °C and 6.6 m/s	ASTM D3763, specimen C, 6.6 m/s impact velocity	J at maximum force	≥ 30 (infor- mation only report one lot)	≥ 30 (infor- mation only report one lot)	≥ 30	≥ 30 (infor- mation only report one lot)	≥ 30 (infor- mation only report one lot)	> 30	≥ 30 (infor- mation only report one lot)
Multiaxial Impact Strength @ -30 °C and 6.6 m/s	ASTM D3763, specimen C, 6.6 m/s impact velocity	J at maximum force	≥ 30 (infor- mation only report one lot)	≥ 30 (infor- mation only report one lot)	≥ 30 Must be 90% ductile	≥ 30 (infor- mation only report one lot)	≥ 30 (infor- mation only report one lot)	≥ 30 Must be 90% ductile	≥ 30 (infor- mation only report one lot)
Multiaxial Impact @ +22 °C (information only)	ISO 6603-2 /40/20/C/4.4 Note 2	J at maximum force	≥ 30 (infor- mation only report one lot)	≥ 30 (infor- mation only report one lot)	>30 Must be 90% ductile	≥ 30 (infor- mation only report one lot)	≥ 30 (infor- mation only report one lot)	> 30 Must be 90% ductile	≥ 30 (infor- mation only report one lot)
Chrome Plated Properties	GMW14668	Not applicable	N/A	N/A	N/A	N/A	N/A	N/A	GMW14668
Chemical Resistance (report one lot)	GMW14334, Code A	Not applicable	≥ Rating 1						