



Acrylonitrile Butadiene Styrene and Polycarbonate Blend, Filled

1 Scope

1.1 Material Description. This standard describes material types of filled Acrylonitrile Butadiene Styrene (ABS) and polycarbonate (PC) blends that are used in injection components.

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

1.2 Symbols. The material abbreviation according to ISO 11469 is >ABS+PC+GF10<, >ABS+PC+GF20<, >ABS+PC+T8<, >ABS+PC+T18<, and >ABS+PC+T14.

1.3 Typical Applications. Typical applications include exterior and interior substrates/brackets that require high temperature stability, high strength, and low Coefficient of Linear Thermal Expansion (CLTE).

2 References

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

2.1 External Standards/Specifications.

ASTM D955	ISO 179/1eA	ISO 1133	ISO 3451-1
ASTM D3763	ISO 294	ISO 1183-A	ISO 6603-2
ASTM E831	ISO 294-3/4	ISO 2580-2	ISO 11359-2
ISO 75-1/2	ISO 527-1/2	ISO 3167	ISO 11469
ISO 178			

2.2 GM Standards/Specifications.

GMW3013	GMW3205	GMW3235	GMW16853
GMW3059	GMW3221	GMW15634	

2.3 Additional References.

TMC003 Material Safety Data Sheet guidance documents (available at www.gmsupplypower.com).

3 Requirements

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

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

3.3 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 2580-2. 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.

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. 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.

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

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 in natural: Stress Strain Curve at +23 °C, +85 °C, -30 °C. Test Report according to GMW16853.

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

Table 1: Compound Properties (Natural and Black)

Property	Standard ^{Note1}	Units	T1 Mean/ (Range)	T2 Mean/ (Range)	T3 Mean/ (Range)	T4 Mean/ (Range)	T5 Mean/ (Range)
Tensile Modulus	ISO 527-1/2	MPa	≥3000	≥4500	≥2800	≥4000	≥3000
Tensile Strength @ Yield	ISO 527-1/2	MPa	≥55	≥60	≥45	≥20	≥50
Flexural Modulus	ISO 178	MPa	≥3000	≥4500	≥2800	≥4000	≥3500
Charpy Notched Impact Strength @ +23 °C	ISO 179/1eA	kJ/m ²	≥10	≥7	≥7	≥10	≥5
Charpy Notched Impact Strength @ -30 °C	ISO 179/1eA	kJ/m ²	≥7	≥6	≥6	≥8	≥5
Density	ISO 1183-A	g/cm ³	1.20 ± 0.03	1.26 ± 0.03	1.23 ± 0.04	1.29 ± 0.03	1.25 ± 0.03
Ash	ISO 3451-1	%	10 ± 2	20 ± 2	9 ± 3	19 ± 3	14 ± 3
Melt Flow Rate 260 °C/5 kg	ISO 1133	cm ³ /10 minutes	Report				
Mold Shrink – Flow Direction (information only)	ISO 294-3/4 or ASTM D955	%	0.35	0.25	0.6	0.55	0.5
Mold Shrink – Cross Flow Direction (information only)	ISO 294-3/4 or ASTM D955	%	0.55	0.55	0.6	0.55	0.5
Heat Deflection Temperature (HDT) – 1.8 MPa	ISO 75-1/2	°C	≥110	≥115	≥105	≥115	≥105
Coefficient of Linear Thermal Expansion (CLTE) – Flow Direction (information only)	ASTM E831 or ISO 11359-2	10 ⁻⁶ mm/(mm*K)	40	30	60	40	45
CLTE – Cross Flow Direction (information only)	ASTM E831 or ISO 11359-2	10 ⁻⁶ mm/(mm*K)	80	80	60	80	60
Multiaxial Impact Strength @ +23 °C and 2.2m/s (information only)	ASTM D3763, specimen C, 6.6 m/s impact velocity	J at maximum force	No specification requirement	No specification requirement	≥35	≥35	≥30