



Polyolefin Alloy – Weather Resistant, 275 MPa Flexural Modulus, Injecting Molding Grade

1 Scope

1.1 Material Description. This specification covers the properties of integrally colored, weather resistant, 275 MPa nominal flexural modulus polyolefin alloy, pellet form, injection molding compound. For the purpose of this specification, polyolefin alloy is defined as an alloy of polypropylene plastic and Ethylene Propylene (EP) or Ethylene Propylene Diene Monomer (EPDM) rubber.

1.1.1 Additional Characteristics. Materials certified to this material specification may have additional characteristics, e.g., paintable, elastomer modified, etc., Possible additional characteristics are defined in GMW3013.

1.2 Symbols. The material abbreviation according to ISO 11469 is >TPO-(PP+EPDM)<.

1.3 Applicability. Typical applications include roof rack gaskets, and isolators.

2 References

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

2.1 External Standards/Specifications.

ASTM D3763	ISO 179/1eA	ISO 1873-2	ISO 11469
ASTM E228	ISO 294	ISO 3167	SAE J1545
ASTM E831	ISO 306	ISO 3451-1	SAE J1976
ISO 75-1	ISO 527-1	ISO 4892-1	SAE J2527-A
ISO 75-2	ISO 527-2	ISO 4892-2	
ISO 75-3	ISO 1133	ISO 6603	
ISO 178	ISO 1183	ISO 11359	

2.2 GM Standards/Specifications.

GMW3013	GMW3221	GMW14650	GMW16847
GMW3059	GMW14270		

2.3 Additional References.

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3 Requirements

Materials approved to this specification shall meet the requirements of GMW3013, General Requirements for Handling of Technical Terms of Delivery for Plastics. Important physical, mechanical and thermal properties that characterize the material are summarized in Table 1. The color shall be specified on drawings and otherwise.

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 1873-2. Test methods and specimen dimensions are also to be in accordance with ISO 1873-2 with the following additions:

Use ISO 3167, Type A, 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.

3.2 Compound Properties. See Table 1. A minimum of six (6) lots shall be tested to Table 1. The following are also required for full specification approval (the minimum number of lots per test required is one (1)):

- Poisson's Ratio
- Stress vs. Strain Curve at +23 °C
- Multiaxial Impact Curve

3.3 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 (Black or Natural)

Properties	Standard	Unit	Values
Mineral Filler (Ash)	ISO 3451-1, Method A at 600 °C	% by mass	2.5% maximum
Density	ISO 1183, Method A	g/cm ³	0.89 to 0.91
Melt Flow Rate (MFR) 230/2.16	ISO 1133	g/10 minutes	20 to 50
Melt Volume Flow Rate (MVR) 230/2.16	ISO 1133	cm ³ /10 minutes	44 to 64
Flexural Modulus	ISO 178, 80 mm × 10 mm × 4 mm specimen, 2 mm/minute test speed, 64 mm support span	MPa	225 to 425
Tensile Modulus	ISO 527-1, ISO 527-2 Specimen 1A, 1 mm/minute test speed	MPa	300 to 400
Tensile Stress at Yield	ISO 527-1, ISO 527-2, Specimen 1A, 50 mm/minute test speed	MPa	9 minimum
Multiaxial Impact Strength at +23 °C ± 2 °C	ASTM D3763, Specimen C, 2.2 m/s impact velocity	J at maximum load	10 minimum All failures must be ductile
Multiaxial Impact Strength at -30 °C ± 2 °C	ASTM D3763, Specimen C, 2.2 m/s impact velocity	J at maximum load	15 minimum All failures must be ductile
Multiaxial Impact Strength at +23 °C ± 2 °C	ISO 6603-2/40/20/C/4.4. Sample to be either square 60 mm × 60 mm minimum, or circle 60 mm diameter minimum. Sample thickness to be 2 mm ± 0.1 mm.	J	10 minimum All failures must be ductile
Multiaxial Impact Strength at 0 °C ± 2 °C (or lowest temperature at which only type YD or YS failures are observed)	ISO 6603-2/40/20/C/4.4. Sample to be either square 60 mm × 60 mm minimum, or circle 60 mm diameter minimum. Sample thickness to be 2 mm ± 0.1 mm.	J	8 minimum All failures must be ductile
Notched Charpy Impact at +23 °C	ISO 179/1eA	kJ/m ²	50 minimum
Notched Charpy Impact at -30 °C	ISO 179/1eA	kJ/m ²	5 minimum