



Polyacrylate Elastomer

1 Scope

1.1 Material Description. This specification covers the properties of a polyacrylate elastomer dynamically vulcanized in a matrix polyamide 6. These materials can be processed by injection molding and blow molding.

1.2 Symbols. The material abbreviation according to ISO 18064 is: >TPV(ACM+PA6)<.

1.3 Applicability. Typical applications include air ducts, isolator grommets, and technical parts requiring high flexibility, excellent heat and chemical resistance, and/or the ability to bond to polyamides via overmolding.

2 References

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

2.1 External Standards/Specifications.

ISO 34-1	ISO 188	ISO 868	ISO 1817
ISO 37	ISO 815	ISO 1183-3	ISO 18064

2.2 GM Standards/Specifications.

GMW3013	GMW3059	GMW3221
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2.3 Additional References.

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

3 Requirements

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

3.1 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.

3.2 Requirements on Test Specimens. Tests shall be conducted using the latest issue of the test methods indicated. Suitable precautions should be taken to ensure that applicable safe limits are not exceeded when conducting test procedures, processes, and/or handling the materials required by this specification.

Tests specimens shall be die cut from fan gated injection molded plaques having a nominal thickness of 2.0 mm $\pm$ 0.2 mm. Die cut specimens are to be tested with the long axis of the test specimen perpendicular to the direction of flow. Plaque dimensions must be sufficient to permit this.

Tests shall be conducted 40 h minimum after molding and immediately following a conditioning period of 24 h minimum per GMW3221, Code A, unless otherwise specified. All tests shall be performed on unannealed specimens. In addition, tests specified at temperatures below or above 22 °C $\pm$ 3 °C shall be conducted at the specified temperature using specimens conditioned at the specified temperature for 4 h minimum.

The minimum values specified in the property tables must be met by test specimens in natural, black, or in a specification sampled color if natural or black are not available. For colored grades where other pigment and additive systems (e.g., stabilizer) are used, the impact values shall not decrease more than 10% from the specified minimum value.

3.3 Compound Properties. See Table 1. A minimum of six 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):

- Young's Modulus

- Poisson's Ratio
- Coefficient of Linear Thermal Expansion (CLTE)
- Stress-Strain Curve at 23 °C

Table 1: Material Properties

Property	Test Method	Units	Type ^{Note 1}		
			A1	A2	B1
Shore A Hardness	ISO 868, 15 s delay	Shore A	75 ± 5	85 ± 5	90 ± 5
Density	ISO 1183-3	g/cm ³	1.10 to 1.16	1.10 to 1.16	1.07 to 1.13
Tensile Strength	ISO 37, Type 1 dumbbell, 500 mm/minute	MPa	7.0 minimum	8.0 minimum	10.0 minimum
Elongation at Break	ISO 37, Type 1 dumbbell, 500 mm/minute	%	150 minimum	150 minimum	150 minimum
Tear Strength	ISO 34-1, Method B, Angle Die, 500 mm/minute	kN/m	6.0 minimum	6.0 minimum	7.0 minimum
Compression Set	ISO 815, Type A, 24 h @70 °C	%	65 maximum	65 maximum	85 maximum
	ISO 815, Type A, 70 h @125 °C		80 maximum	80 maximum	90 maximum
Properties After Short Term Heat Aging	ISO 188; 168 h at 175 °C in an air-circulation oven followed by the indicated property testing at 23 °C	Change in Properties	-35 maximum -35 maximum		
Tensile Strength		%			
Elongation at Break		%			
Properties After Long Term Heat Aging	ISO 188; 1000 h at 150 °C in an air-circulation oven followed by the indicated property testing at 23 °C	Change in Properties	No objectionable color change or tackiness -40 maximum -40 maximum		
Tensile Strength		%			
Elongation at Break		%			
Properties After Long Term Fluid Exposure	ISO 1817; Immersion in IRM 903 for 70 h @ 125 °C followed by the indicated property testing at 23 °C	Change in Properties	-20 maximum -40 maximum Record -10 maximum		
Tensile Strength		%			
Elongation at Break		%			
Tear Strength		%			
Volume Change		%			

Note 1: Type A materials are injection moldable; Type B materials are blow moldable.

4 Manufacturing Process

Not applicable.