



Elastomeric Cover Materials

1 Scope

This specification covers material properties and test procedures for elastomeric and thermoplastic elastomer rubber used as heat, noise and abrasion protection sleeving.

1.1 Material Description. Materials are divided into the following types.

1.1.1 Type A: Elastomeric materials.

1.1.2 Type B: Thermoplastic elastomers to respective material specification.

1.2 Symbols. Not applicable.

1.3 Applicability. The intended application of this material is for use as sleeve cover tubing. The temperature capability of the material is 125 °C continuous, 150 °C excursion.

2 References

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

2.1 External Standards/Specifications.

ISO 37	ISO 188	ISO 1431-1
ISO 48	ISO 868	FMVSS 302

2.2 GM Standards/Specifications.

GMW3059	GMW3235	GMW15634
GMW3205	GMW14270	GMW16317
GMW3232	GMW14444	

3 Requirements

3.1 Resources.

3.1.1 Test Samples. Unless otherwise specified, the shape, size and number of test pieces shall be in accordance with the relevant test method.

Unless otherwise specified, samples are finished parts or to be taken from finished parts. **Note:** Where the dimensions on the finished parts do not allow preparing of test pieces, tests are to be performed on sheet material of same production batch. The same state of cure between slabs or buttons and finished parts must be assured by appropriate tests, which must be described in the test report.

Unless otherwise stated, ambient temperature test conditions shall be held to $+23\text{ °C} \pm 5\text{ °C}$, all other temperatures shall be held to $\pm 3\text{ °C}$. If not otherwise stated, mechanical properties in delivery state and after heat or fluid immersion are to be tested at $+23\text{ °C}$ and with the same test methods.

3.1.2 Conditioning. Conditioning shall be as specified in the relevant test method.

3.1.3 Equipment. Conforming to the relevant test method.

3.1.4 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.5 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this specification shall be determined correctly with respect to its physical definition.

3.1.6 Facilities. Conforming to the relevant test method.

3.1.7 Deviations. Deviations from the requirements of this specification shall have been agreed upon. Such deviations shall be specified on component drawings, test certificates, reports, etc.

3.2 Dimensions and Tolerances. Hose dimensions and tolerances shall be as specified by the purchaser.

3.3 Cover Material Marking. The cover material shall be legibly marked with the GM part number, Date Code of Manufacture, Source Identification (ID) per the Association of Rubber Products Manufacturers (ARPM), and the GM specification (GMW17559).

3.4 Material and Performance Requirements. Material and performance requirements are summarized in Table 1 and Table 2.

Table 1: Material and Performance Properties

Property	Test Procedure	Unit	Value
Hardness			
Type A	Hardness to ISO 48 Method M	IRHD	65 - 80
Type B	Hardness to ISO 868, 15 s delay	Shore A	See part drawing
Elongation at Break			
Type A and Type B	ISO 37, Type 4 dumbbell, 200 mm/minute $\pm$ 20 mm/minute or ASTM D412, Method A.	%	200 Minimum
Tensile Strength			
Type A and Type B	ISO 37, Type 4 dumbbell, 200 mm/minute $\pm$ 20 mm/minute or ASTM D412, Method A.	MPa	7.6 Minimum
Age Resistance (Heat Aging)			
Type A and Type B	ISO 188 Method B, 72 $\pm$ 0/-2 h at 150 $^{\circ}$ C $\pm$ 3 $^{\circ}$ C. Change in hardness Change of elongation at break Change of tensile strength	IRHD % %	+15 Maximum -60 Maximum -20 Maximum
Cold Flexibility			
Type A and Type B	A mandrel of OD 10x the OD of the tubing shall be used for the test. The hose sample and the mandrel shall be conditioned 40 $^{\circ}$ C $\pm$ 2 $^{\circ}$ C for 24 h $\pm$ 0/-2 h. The hose shall be in a straight position during the conditioning period. While the hose and the mandrel are still at the -40 $^{\circ}$ C temperature, the hose shall be bent at least 180 degrees around the mandrel within a period of 4 s.		Tubing must not fracture or show any cracks, breaks, or checks in the tube or cover.
Ozone Resistance			
Type A and Type B	ISO 1431-1 100 pphm, 40 $^{\circ}$ C $\pm$ 2 $^{\circ}$ C for 336 h $\pm$ 0 h/-2 h. Hose bent around a mandrel having a diameter of eight (8) times the nominal OD of the hose Visual Examination, 2x magnification.		No cracks permitted.
Bloom			
Type A and Type B	GMW16317, Method A, Visual Examination		No deposit of solid on the surface