



Elastomeric Membrane – Brake Booster

1 Scope

This specification covers the materials and performance of elastomeric membranes for brake boosters.

1.1 Material Description. Materials covered by this specification are divided into three (3) Types: continuous and peak temperature limit are as defined by the Vehicle Technical Specifications (VTS).

1.1.1 Type A. Styrene Butadiene Rubber (SBR), continuous operating temperature limit = 100 °C.

1.1.2 Type B. Ethylene Propylene Diene Terpolymer (EPDM) continuous operating temperature limit = 125 °C and +150 °C peak temperatures.

1.1.3 Type C. Drawing defined (e.g., using SAE J200 or ASTM D2000 line callout).

1.2 Symbols. Not applicable.

1.3 Applicability. Elastomeric membranes for brake boosters.

2 References

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

2.1 External Standards/Specifications.

ASTM D2000	ISO 48	ISO 1817	SAE J200
ISO 34-1	ISO 188	ISO 23529	
ISO 37	ISO 1431-1		

2.2 GM Standards/Specifications.

GMW3059	GMW14270	GMW16995
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2.3 Additional References.

Vehicle Technical Specifications (VTS).

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

Table 1: Material and Performance Properties

Property	Test Method	Unit	Value
Hardness			
Type A and Type B	ISO 48 Method M	IRHD	+65 +5/-10
Type C	As specified on drawing/math data file	Shore A	As specified on drawing
Elongation at Break			
Type A and Type B	ISO 37, Type 4 dumbbell, 200 mm/minute $\pm$ 20 mm/minute	%	300 Minimum
Type C	As specified on drawing/math data file	%	As specified on drawing
Tensile Strength			
Type A and Type B	ISO 37, Type 4 dumbbell, 200 mm/minute $\pm$ 20 mm/minute	MPa	15 Minimum
Type C	As specified on drawing/math data file	MPa	As specified on drawing
Tensile Modulus at 100% Elongation			
Type A and Type B	ISO 37, Type 4 dumbbell, 200 mm/minute $\pm$ 20 mm/minute	MPa	1.5 Minimum
Type C	As specified on drawing/math data file	MPa	As specified on drawing
Tear Strength			
Type A and Type B	ISO 34-1 Method A (trouser test piece)	N/mm	4 Minimum
Type C	As specified on drawing/math data file	N/mm	As specified on drawing
Age Resistance (Heat Aging) short term			
Type A	ISO 188 Method B, 168 h -2 h at +100 °C $\pm$ 3 °C Change in Hardness Change in Elongation at Break Change in Tensile Strength Change in Tear Strength Tensile Modulus at 100% Elongation	IRHD % % % MPa	+10 Maximum -40 Maximum -30 Maximum -40 Maximum 3 Minimum
Type B	ISO 188 Method B, 168 h -2 h at +125 °C $\pm$ 3 °C Change in Hardness Change in Elongation at Break Change in Tensile Strength Change in Tear Strength Tensile Modulus at 100% Elongation	IRHD % % % MPa	+10 Maximum -20 Maximum -10 Maximum -25 Maximum 2.5 Minimum
Type B	ISO 188 Method B, 72 h -2 h at +150 °C $\pm$ 3 °C Change in Hardness Change in Elongation at Break Change in Tensile Strength Tensile Modulus at 100% Elongation	IRHD % % MPa	+10 Maximum -50 Maximum -30 Maximum 2 Minimum
Age Resistance (Heat Aging) Long Term, Once for Initial Approval			