GM	WORLDWIDE ENGINEERING STANDARDS	Material Specification	GMW14717

Elastomeric Ball Joint Boots

1 Scope

1.1 Material Description. This standard covers the requirements for elastomeric ball joint boots, for service free ball and socket joints used in steering and suspension assemblies. Materials covered by this specification are divided into three (3) Types.

1.1.1 Type A. Polychloroprene (CR) with maximum 5% by mass Nitrile Butadiene Rubber (NBR); for normal use on passenger vehicles and light commercial vehicles.

1.1.2 Type B. Polyurethane (PU) Elastomer; for use in arduous conditions, such as heavy commercial vehicles.

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 ball joints boot, used in steering and suspension assemblies.

2 References

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

2.1 External Standards/Specifications.

ASTM D2000	ISO 188	ISO 1817	ISO 23259
ISO 37	ISO 868	ISO 2285	SAE J200
ISO 48	ISO 1431-1		

2.2 GM Standards/Specifications.

GMW3059	GMW14270

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 procedure.

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 °C ± 5 °C, all other temperatures shall be held to ± 3 °C. If not otherwise stated, mechanical properties in delivery state and after heat or fluid immersion are to be tested at +23 °C and with the same test procedures

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

3.1.3 Equipment. Conforming to the relevant test procedures.

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 standard shall be determined correctly with respect to its physical definition.

3.1.6 Facilities. Conforming to the relevant test procedures.

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3.1.7 Deviations. Deviations from the requirements of this standard 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	ISO 48 Method M	IRHD	55 ± 5
Type B	ISO 868	Shore A	85 ± 5
Type C	As specified on drawing/math data file	Shore A	As specified on drawing
Elongation at Break			
Type A, Type B	ISO 37, Type 4 dumbbell, 200 mm/minute ± 20 mm/minute	%	400 Minimum
Type C	As specified on drawing/math data file	%	As specified on drawing
Tensile Strength			
Type A	ISO 37, Type 4 dumbbell, 200 mm/minute ± 20 mm/minute	MPa	10 Minimum
Type B	ISO 37, Type 4 dumbbell, 200 mm/minute ± 20 mm/minute	MPa	17.5 Minimum
Type C	As specified on drawing/math data file	MPa	As specified on drawing
Age Resistance (Heat Aging)			
Type A	ISO 188 Method B, 168 h -2 h at 70 °C ± 3 °C Change in Hardness	IRHD	± 5 Maximum
Type B	ISO 188 Method B, 168 h -2 h at 70 °C ± 3 °C Change in Hardness	Shore A	-10 to +5
Type C	As specified on drawing/math data file	N/mm	As specified on drawing
Grease Resistance			
Types A, Type B	ISO 1817, Grease see drawing, 168 h -2 h at 70 °C ± 3 °C Change in Hardness Change of Volume	IRHD/Shore A %	± 5 ± 15
Type C	As specified on drawing/math data file		As specified on drawing
Grease Resistance followed by Ozone Resistance			
Type A, Type B	Condition test pieces for ozone testing in grease to the parameters defined above, remove grease with a paper or cloth and perform Ozone Resistance to ISO 1431-1, 50 pphm, 20% strain on mandrel, 40 °C ± 2 °C, 72 h -2 h, Visual examination		No cracks

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