GM WORLDWIDE ENGINEERING STANDARDS	Test Procedure	GMW14363

Determination of Indentation Hardness of Foam Components at Constant Force

1 Scope

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This test procedure shall be used to determine the indentation hardness of small elastic foam components where the size of the component precludes the use of other standard methods.

The results obtained by measurements on components of differing shapes, or at different locations on the same component, or by the use of different sized indentors are not necessarily comparable.

Test results obtained by measurements on components of similar shape, but of different structures (cellular, etc.), are comparable provided measuring conditions are identical.

The indentation hardness is defined as the depth of penetration (in millimeters) of a standard shaped indentor when pressed under constant force into the foam component for 30 s, 60 s, or other time as may be specified.

1.2 Foreword. Not applicable.

1.3 Applicability. Polyurethane (PUR) back foaming Instrument panel, headrest, armrest, soft integral foam.

2 References

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

2.1 External Standards/Specifications.

ISO 5893

2.2 GM Standards/Specifications.

GMW3221

3 Resources

3.1 Facilities. Not applicable.

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

3.1.2 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 their physical definition.

3.2 Equipment.

3.2.1 Suitable test equipment is a tensile testing machine complying with ISO 5893, equipped with a compression gauge and capable of maintaining the specified constant force over the specified period.

3.2.2 Alternative test equipment shown in Figure 1 is suitable.

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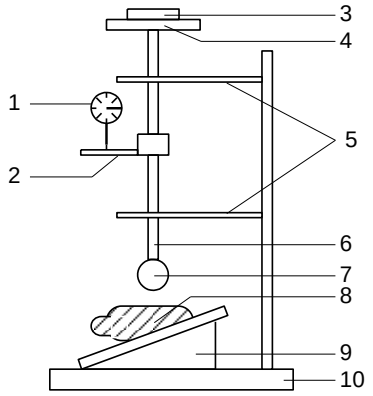

Key:

1 Dial gauge (mounted on base plate)
2 Arm which actuates dial gauge
3 Weights added
4 Weight table
5 Guides etc., attached to base stand, and allowing free movement of rods.
6 Rod
7 Indentor
8 Component
9 Support
10 Baseplate

Figure 1: Alternative Test Equipment

3.2.3 The test apparatus shall consist of an indentor (steel, aluminum or wood of dimensions as given in Table 1) and means of applying this indentor to the component under a pre-force and primary force (see Table 1).

3.2.4 Means of measuring the depth of penetration of the indentor into the component to an accuracy of ± 0.01 mm.

3.2.5 A supporting surface made of a suitable material shall be shown on the relevant engineering drawing.

3.2.6 Stopwatch subdivided in 0.1 s.

3.2.7 For first sample approval and arbitration purposes, the method described in 3.2.3 shall be used.

3.3 Test Vehicle/Test Piece. See 3.2.5 (dependent on part geometry).

3.3.1 Shape of Test Piece. The complete component shall be used as a test piece in accordance with the engineering drawing.

3.3.2 Number of Test Pieces.

3.3.2.1 For initial sample approval and arbitration purposes, the indentation hardness shall be determined on a minimum of 5 test pieces.

3.3.2.2 For routine quality control, a minimum of 3 test pieces shall be used.

3.4 Test Time. Not applicable.

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Not applicable.

4 Procedure

4.1 Preparation.

4.1.1 Components for first sample approval and arbitration purposes shall be tested not less than 7 days after manufacture.

4.1.2 Components for routine quality control purposes shall be tested not less than 3 days after manufacture.

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