GM WORLDWIDE ENGINEERING STANDARDS	Test Procedure	GMW16317

Bloom Tests for Elastomeric Parts

1 Introduction

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 standard describes several methods for determining the tendency of elastomeric parts/materials to bloom.

1.2 Applicability. These test methods are applicable to all dense elastomeric materials, including weatherstrip extrusion profiles and molded sections, and coolant hoses (Method A).

1.3 Remarks. None.

2 References

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

2.1 External Standards/Specifications.

ISO 188 ISO 23529

2.2 GM Standards/Specifications.

None

2.3 Additional References. None.

3 Resources

3.1 Facilities. See 3.1.1 and 3.1.2.

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 Non-contaminating container of suitable size, e.g., desiccator, for test piece (Method A).

3.2.2 Environmental chamber, capable of temperature range -30 °C to +100 °C ± 3 °C. (Optional equipment: heating oven to ISO 188 Method B and cold chamber to ISO 23529.)

3.2.3 Box (wood or cardboard), approximately 450 mm length x 450 mm width x 200 mm height (Method B). See Figure A1, Appendix A.

3.2.4 Tape suitable for sealing the wood or cardboard box.

3.2.5 Polyethylene (PE) bag.

3.2.6 Copper plate with dimensions 30 mm length x 20 mm width x 0.5 mm height.

3.2.7 Wiener Kalk (Vienna Chalk or Lime), a mixture of 25% Kaolinite and 75% Quartz or an equivalent pulverized calcium magnesium carbonate (Dolomite).

3.2.8 Ethanol.

3.2.9 Glass panes and suitable weight (Method D).

3.3 Test Vehicle/Test Piece. See relevant test method in 4.3.

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3.3.1 Test Specimens. Test specimens shall be cut from finished production parts.

3.4 Test Time. See relevant test method in 4.3.

3.5 Test Required Information. See relevant test method in 4.3 and 5.3.

3.6 Personnel/Skills. Per laboratory accreditation requirements.

4 Procedure

4.1 Preparation.

4.1.1 Test Sample Preparation. See relevant test method in 4.3.

4.2 Conditions.

4.2.1 Environmental Conditions. The minimum time between manufacturing and testing shall be 72 h. The test pieces shall be maintained at a temperature of 23 °C ± 5 °C and 50% ± 5% relative humidity for at least 24 h prior to test and shall be free from strain during this period.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 Environmental Cycling (Method A).

4.3.1.1 Place a sample of the elastomeric part (approximately 50 mm in length) into a suitable, clean, non-contaminating container. Close the container and expose to the following:

- 48 h +0 h/-2 h at -30 °C ± 3 °C
- 48 h +0 h/-2 h at +100 °C ± 3 °C
- 72 h +0 h/-2 h at -30 °C ± 3 °C
- 168 h +0 h/-2 h at +100 °C ± 3 °C

4.3.1.2 Check surface daily, when possible, and at the end of exposure for solid deposit (bloom) on the surface of the part.

4.3.2 "Sealed Box" Storage (Method B).

4.3.2.1 Place test sample (250 mm to 300 mm in length) into box. Multiple samples may be placed into the same box, provided care is taken that samples do not contact one another.

4.3.2.2 Seal box with tape to prevent air and light from entering.

4.3.2.3 Store samples in box for 12 weeks at +23 °C ± 5 °C.

4.3.2.4 At end of 12 weeks, evaluate parts for solid deposit (bloom) on surface of weatherstrip.

4.3.3 Water Immersion. For both Methods (C1 and C2), the water and the sample are placed inside the PE bag.

4.3.3.1 Full Immersion Method (Method C1).

4.3.3.1.1 Place PE bag into a suitable holder (i.e., a beaker). Place test specimen in the PE bag, fill bag with deionized water until sample is fully immersed, and securely close the bag.

4.3.3.1.2 Store fully immersed test sample in a closed PE bag for 4 h (+0 minutes/-10 minutes) at +80 °C ± 3 °C.

4.3.3.1.3 Remove sample from water and check for discoloration (blooming).

4.3.3.2 Half Immersion Method (Method C2).

4.3.3.2.1 Place PE bag into a suitable holder (i.e., a beaker). Place test specimen in the PE bag, fill with deionized water until half the sample is immersed, and securely close the bag.

4.3.3.2.2 Store test sample in a closed PE bag half immersed in deionized water for 24 h +0 h/-2 h at +40 °C ± 3 °C.

4.3.3.2.3 Remove sample from water and check immersed section for discoloration (blooming).

4.3.4 Copper Plate Tests (Method D). Copper plate test is used to detect excessive sulfur (improper vulcanization or surplus addition of curing agent) with a sandwich of rubber and polished copper plate. See Figure A2, Appendix A.

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