

**FLEX TEST FOR POLYMERIC COATED FABRICS AND GENUINE LEATHERS****Application**

This procedure is used to determine the resistance to flexing of automotive trim materials such as polymeric coated fabrics and genuine leathers.

Scope

A sample mounted in a cylindrical shape is flexed in cycles consisting of alternate compression by a load applied along the axis of the cylinder and return to the position at start of compression.

Apparatus Required**Flexing Machine**

A "W" Flex Tester, or equivalent device, which will flex the cylindrical shaped sample 12.7 mm along its vertical axis at a rate of 450 cycles per minute.

Plugs

Metal plugs approximately 25.4 mm O.D. and approximately 45 mm long are inserted in each end of the cylindrical test specimen. The projecting ends of the plugs have holes for attachment to the flex testing machine.

Clamps

Hose clamps 16 mm in width and having a 26 mm I.D. are required for clamping the specimen to the plugs.

Magnifier Light

A 6 $\pm$ 1x magnifier light may be required for examination of the test specimen upon completion of the prescribed number of flexing cycles.

Holding Jig

A small jig for accurately spacing the metal plugs while mounting the samples may be of some assistance. The spacing may also be accomplished with the assembly in position on the flex tester.

Mandrel

A 12.5 mm mandrel is required for samples evaluation.

Chemicals, materials, parts, and equipment referenced in this document must be used and handled properly. Each party is responsible for determining proper use and handling in its facilities.

Date	Action	Revisions	Rev 02
2011 04 20	Revised	See summary of revisions S. Stanciu, FNA / J. Williams FoE	
2001 09 17	Revised	Editorial – no technical change	A. Cockman
1990 04 10			

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Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Procedure

1. Cut a 63 x 79 mm test specimen with the long dimension parallel to the filling or width (for vinyls only - other materials as specified in the Engineering Materials Specifications) of the material and not closer than 10 % of the full width of the material to an edge or selvage.
2. Roll the test specimen into a cylindrical shape, coating or face side out, with the short dimension along the length of the cylinder. (See attached sketch showing mounted assembly.)
3. Slip a loosened hose clamp over one end of the test specimen and insert a metal plug 25 mm inside the sample. Do the same for the other end of the sample.
4. Tighten the hose clamps around the specimen and plugs. The openings of the clamps shall be over the joint in the cylindrical specimen to prevent wrinkling. The metal plugs shall be positioned so that a 19 mm length of the specimen is left between the plugs free for flexing.
5. Place the mounted sample in its proper position on the flex tester between the fixed and movable plates opened to their fullest extend, both plugs being seated evenly together on threaded studs to avoid stretching or distortion of the specimen. Fasten the plugs by means of wing nuts.
6. Start the machine and flex the test specimen for the number of cycles required by the relevant Engineering Materials Specification. Each cycle consists of a downward compression stroke of 12.7 mm and return to the original position.
7. Examine and report any failure in the test specimen as stipulated by the relevant Engineering Materials Specification.

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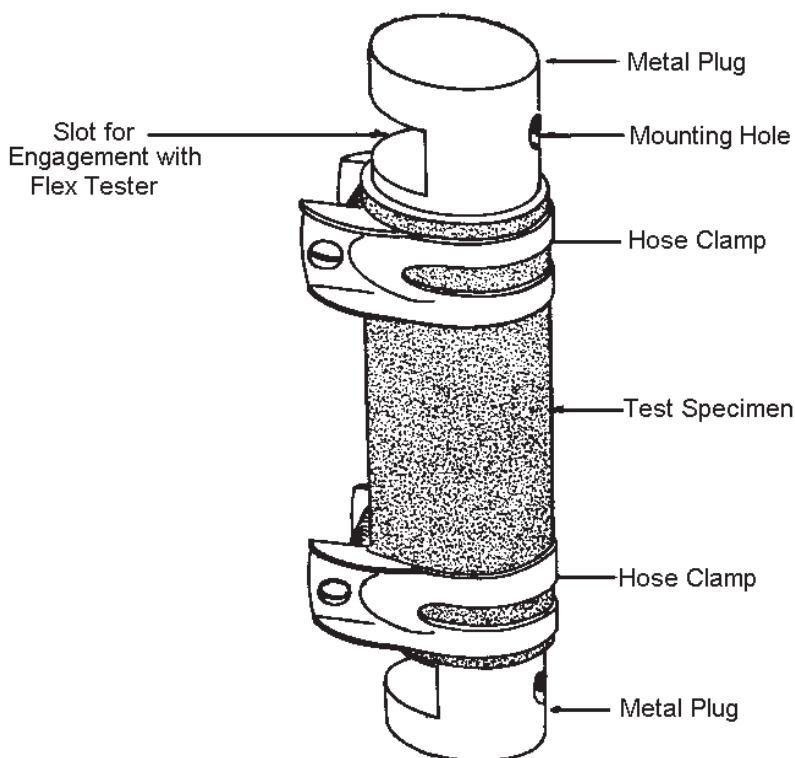


Fig. 1 - Sketch Showing Method of Mounting Sample for Flex Test

Evaluation Criteria

The specimens should be wrapped over a 12.5 mm dia mandrel and then reviewed under 6x±1x magnifications.

- Rating: **1** – No damage (see Figs. 2 & 3)
2 – Discoloration or thin cracks in the top finish coat only (see Figs. 4 & 5)
3 – Cracks into base coats (see Fig. 6)
4 – Cracks large enough to see the fabric/leather substrate below (Fig.7)
5 – Finish cracks and peels back or flakes off (Fig. 8).

All pictures were taken at approx. 6x magnifications.

If one out of 3 specimens per orientation is borderline to the pass/fail criteria, two additional specimens should be evaluated and the ratings reported.

Summary of revisions:

- Removed woven fabrics from method scope
- Added evaluation criteria
- Added pictures for Ratings 1 through 5 (Figs. 2 through 8)