

BALLY FLEX TEST FOR AUTOMOTIVE SEAT COVER MATERIALS

Application

This procedure is used to determine the resistance to flexing of automotive trim materials such as polymeric film coated fabric and/or leather.

Scope

A specimen is mounted by clamping one end in the upper clamp of the flexing machine with the grain surface folded inwards so that the surfaces touch and the fold line is horizontal, then the loose end is turned inside out and bent 90° before being inserted in the lower clamp. In the lower clamp the specimen is held inside surface to inside surface and the fold line is vertical. Oscillation of the upper clamp during the test causes the point of transition from inward to outward fold to run up and down the specimen. The method is based on ASTM D6182 and ISO 5402 (Note 1).

Apparatus Required

Bally Flexometer SATRA Model STM 701 or equivalent device (see Fig.1) which will produce a flexing motion as described above. Correlation between various types of machines may be required.

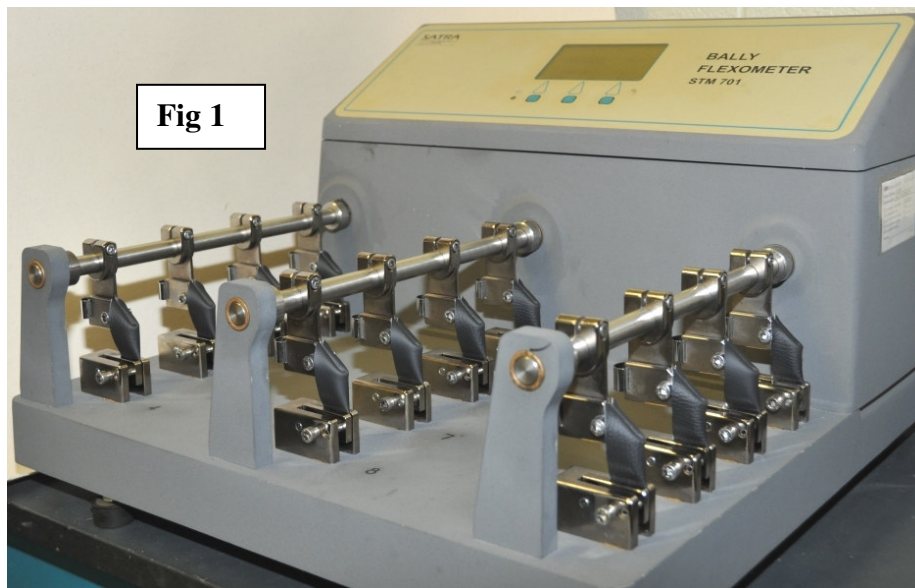


Fig 1

Magnifier glass, 6x +/- 1x magnification

12.5 mm diameter mandrel

Specimen cutting die of 45 mm x 69 mm for SATRA STM 701 (see Note 1).

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. 0
2011 03 30	Activated		



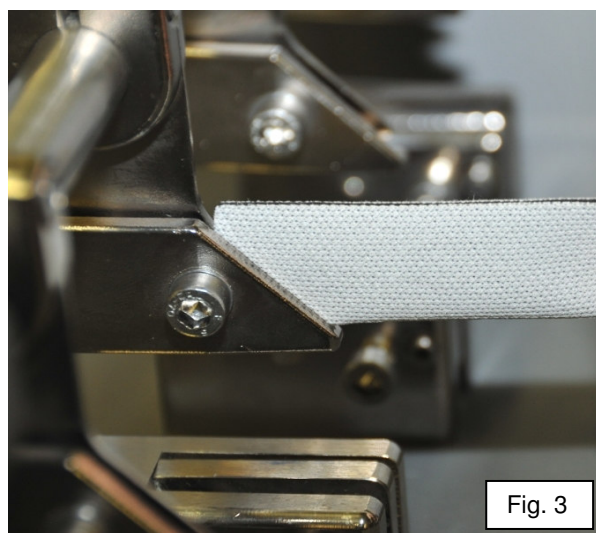
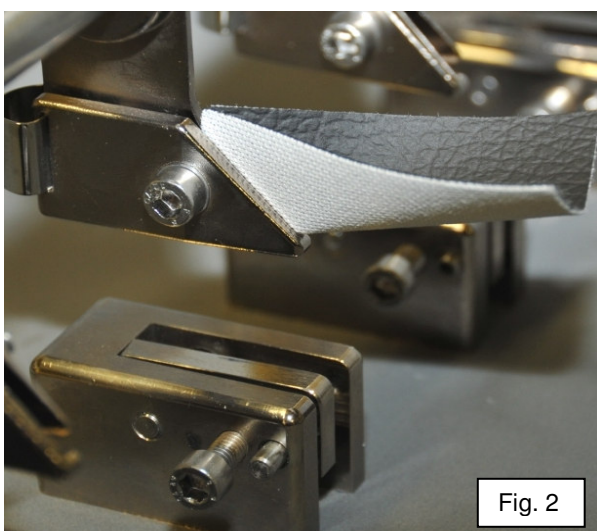
Note 1: For other type of machines the length of the specimen may vary due to the bottom clamp height and/or distance between upper and lower clamps. Use Table 1 at the end of the document to estimate the length of the specimen so that the required alignment of the specimen with the bottom of the lower clamp as described in the sample mounting procedure can be achieved.

Conditioning and Test Conditions

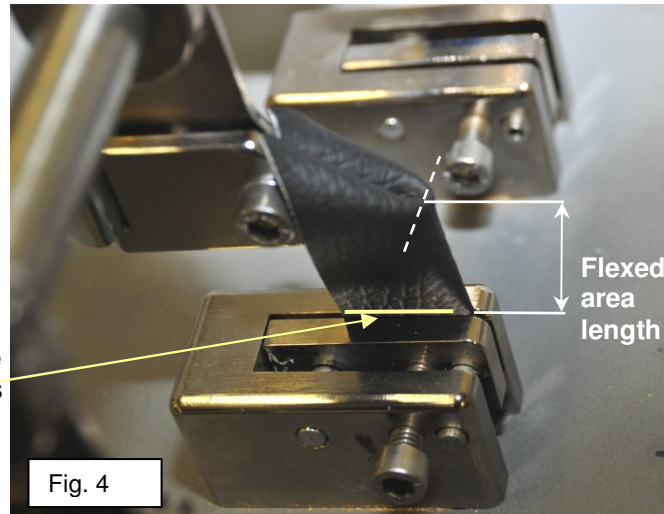
All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5% relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Procedure

1. Cut out test specimens 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. By the means of machine's Jog button, adjust the upper clamp to the horizontal position i.e the clamps are in their forward position.
3. Fold each specimen grain or outer/face side inwards along the centre line, so that the two longer edges are brought together.
4. Insert one end of the folded specimen into the end of the upper clamp in such way that the fold line is horizontal and rests on the ledge and the end of the specimen touches the screw (Fig. 2 and 3).
5. Tighten the clamping screw so that the test specimen is gripped firmly along the front edge.



6. Fold the specimen inside out around the top clamp (at 90° angle) so that it is again folded along the center line but this time with the grain or outer face outward. The center fold will now be vertical and the two longer edges will again be brought together (Fig. 4).



7. Apply just sufficient hand tension to the specimen so that it is taut and there is no obvious bagginess around the top clamp. Insert the lower end of the test specimen in the bottom clamp with the fold vertical as judged by the eye, and clamp it firmly so that the specimen is not loose but not under tension either. The end of the specimen should be even with the bottom of the lower clamp.
8. Load the remaining test stations that are being used in the same way.
9. Set the counter to the number of flexes required and start the test. If during the flexing the machine needs to be stopped for any length of time, make sure that the moveable clamps are near the bottom of their oscillation so that the test pieces are not held taut.

If intermediate evaluations are required, the lower clamp placement must be first marked on specimen to ensure its placement in the same location when re-loaded for additional testing. This will prevent any additional stretch of the material from loading and unloading.

Evaluation Criteria

The specimens should be wrapped over a 1.25 cm dia mandrel and then reviewed under 6x±1x magnifications.

Rating:

- 1 – No damage (see Figs. 5 & 6)
- 2 – Discoloration or thin cracks in the top finish coat only (see Figs. 7 & 8)
- 3 – Cracks into base coats (Fig. 9).
- 4 – Cracks large enough to see the fabric/leather substrate below (Fig. 10)
- 5 – Finish cracks and peels back or flakes off (Fig. 11).

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.