



Designation: **D6182–00 (Reapproved 2015) D6182 – 23**

Standard Test Method for Flexibility and Adhesion of Finish on Leather¹

This standard is issued under the fixed designation D6182; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method is intended for use on finished leather to evaluate resistance to cracking, delamination, and discoloration of the finish when subjected to repeated flexing. This test method does not apply to wet blue.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

[D1517 Terminology Relating to Leather](#)

[D1610 Practice for Conditioning Leather and Leather Products for Testing](#)

[D2813 Practice for Sampling Leather for Physical and Chemical Tests](#)

2.2 *ENISO Standard:*³

[DIN 53354 ISO 32100 Dauerfaltverhalten Rubber- or plastics-coated fabrics—Physical and mechanical tests—Determination of flex resistance by the flexometer method](#)

3. Terminology

3.1 *Definitions*—Terms used in this test method are defined in accordance with Terminology [D1517](#).

4. Summary of Test Method

4.1 Leather is conditioned according to one of two prescribed procedures, flexed in a Bally Flexometer,⁴ and an endpoint is determined by rating the degree of damage after a fixed number of flexes.

¹ This test method is under the jurisdiction of ASTM Committee [D31](#) on Leather and is the direct responsibility of Subcommittee [D31.07](#) on Physical Properties. Current edition approved May 1, 2015; Sept. 1, 2023. Published July 2015; September 2023. Originally approved in 1997. Last previous edition approved in 2010 as D6182 – 00 (2010) (2015). DOI: 10.1520/D6182-00R15.10.1520/D6182-23.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ [DIN 53354 ISO 32100 Dauerfaltverhalten](#) is published by [DIN Deutsches Institut für Normung](#), the International Organization for Standardization and is available from ANSI, 11 W. 42nd St., 13th Floor, New York, NY 10036, and from Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112.

⁴ Equipment conforming to [DIN 53354 ISO 32100](#) is available from [Bally Trading Ltd. Prüfgeräteverkauf, CH-5012 Schönenwerd, Switzerland](#), [Soraco SRL Via Orfanotrofo, 26 13900 Biella, Italy](#), Other manufacturers are [Giuliani S.N.C., Via Cervino, 10 Torino, Italy](#), and [Pellizzato Bruno, 31033 Salvarosa di Castelfranco Veneto \(Treviso\), Borgo Mandolato 13, Italy](#) and [Schap Specialty Machine, Inc. Spring Lake, MI, USA](#).

5. Significance and Use

5.1 This test method is intended for use on any type of finished leather.

5.2 This test method will give an indication of the flexibility, adhesion, and strength of the finish on leather.

6. Apparatus

6.1 *Bally Flexometer*, conforming to ~~DIN 53351~~, ISO 32100, and operating at a rate of 100 cycles/min.

6.2 Die for cutting leather specimens to ~~45 × 70 mm~~, 45 mm by 70 mm.

7. Reagents and Materials

7.1 *Distilled or Deionized Water*.

8. Sampling, Test Specimens, and Test Units

8.1 Sample leather according to Practice **D2813**.

8.2 Cut two test pieces ~~45 × 70 mm~~ 45 mm by 70 mm from each sample using a die. ~~One die, one piece cut parallel and the other perpendicular to the backbone.~~

9. Conditioning

9.1 *Dry Leather Test*—Prepare the test pieces according to Practice **D1610**.

9.2 *Wet Leather Test*—Submerge the test pieces in distilled or deionized water for ~~20 ± 1 min~~, 20 min ± 1 min. Blot excess water off using blotting paper or a paper towel.

9.3 *Other Test*—Conditioning, other than as prescribed, shall be documented in the results.

10. Procedure

10.1 Bring the upper clamp of the Bally Flexometer to its uppermost position.

10.2 Fold the test piece in half along its major axis with the finished side toward the middle.

10.3 Insert the folded test piece in the top clamp, and tighten the clamp.

10.4 Fold the test piece around the top clamp and down.

10.5 Lightly pinch the leather at the top clamp to remove slack and to position the downward fold vertically in the bottom clamp. Tighten the bottom clamp. A properly mounted test piece will not have any tension between the top and bottom ~~clamps~~ clamps (see [Fig. 1](#)).

10.6 Set the counter to zero and the cutoff to the desired number of cycles.

10.7 ~~Examine~~ If required, examine the test piece using a magnifying glass with $6 \pm 1\times$ magnification.

11. Interpretation of Results

11.1 *Endpoint Determined after Fixed Number of Flexes*—Rank the damage according to **Table 1**.

TABLE 1 Rank of Damage

Rank	Description of Damage
1	No damage
2	Discoloration or thin cracks in top finish coat only
3	Cracks into base coats
4	Cracks large enough to see leather substrate below
5	Finish cracks and peels back or flakes off



FIG. 1 Properly Loaded Sample

12. Report

12.1 For an endpoint determined by 11.1, report the conditions used in Section 9, the number of cycles, and the rank in Table 1 of each test piece in the sample.

13. Precision and Bias

13.1 No information is presented about either the precision or bias of this test method for measuring flexibility and adhesion of finish on leather, since the test result is nonquantitative.

14. Keywords

14.1 Bally flexometer; finish adhesion; finish flexibility; finish strength; leather