Designation: D 4831 – 88 (Reapproved 1999)

Designation: D 4831 – 00

Standard Test Method for Buckle Tear Strength of Leather[1]

This standard is issued under the fixed designation D 4831; 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] This test method is under the jurisdiction of ASTM Committee D-31 on Leather and is the direct responsibility of Subcommittee D31.01 on Vegetable Leather.
Current edition approved ~~May 27, 1988.~~ Sept. 10, 2000. Published ~~July 1988.~~ October 2000. Originally published as D 4831 – 88. Last previous edition D 4831 – 88.

1. Scope

1.1 This test method is intended for use on all types of leather to determine the load required to tear a leather strap fastened in a buckle. This test method does not apply to wet blue.

1.2 *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.*

2. Significance and Use

2.1 This test method is designed to measure the load required to tear a leather strap fastened in a buckle. Tanners and leather buyers have found that this test gives an indication of the resistance of leather to tearing.

2.2 This test method should be suitable for specification acceptance, design purposes, manufacturing control, development, and research. The thickness of the specimen and direction of tear relative to the backbone will affect the uniformity of the test results. This test method may not apply when the conditions of the test employed differ widely from those specified in this test method.

3. Apparatus

3.1 *Gage,* spring-type, for measuring thickness of units, graduated in 0.5 oz or 0.1 mm having a flat pressure foot 0.4 ± 0.025 in. (10.2 ± 0.6 mm) in diameter and a flat anvil 0.4 ± 0.025 in. in diameter. The spring shall exert a force of 1 lbf (4.45 N) on the foot when the gage reads 2 oz and 2 lbf (8.9 N) when the gage reads 12 oz.

3.2 *Steel Punch,* which will make a 3⁄16 in. (4.8 mm) diameter hole.

3.3 *Harness Buckle,* 1.25 in. (4.7 mm) with a 0.175 ± 0.005-in. (4.4 ± 0.1-mm) diameter tongue. It shall be attached to a strong strap, 1.25 in. wide and at least 5 in. (127 mm) long. The strap shall be equipped with a keeper located approximately 0.75 in. (19 mm) from the buckle.

3.4 *Testing Machine,* power-driven. The applied load shall be indicated on a dial, scale, or chart. The load indicator shall record or indicate the maximum load at the time of rupture of the specimen. The machine shall be equipped with a set of grips for clamping the specimens. The faces of the grips should be knurled or otherwise roughened to prevent slipping of the specimen. The gripping surfaces shall be at least 1 by 1½ in. (25.4 by 38 mm). The grips shall be mounted with the longer dimension perpendicular to the direction of the application of the load. The speed of the power-activated grip shall be a uniform speed of 10 ± 2 in. (254 ± 50 mm)/min when running free. The error of the machine up to a load of 50 lbf (222 N) shall not exceed 2 %; at loads of more than 50 lbf the error shall not exceed 1 %.

4. Sampling, Test Specimens, and Test Units

4.1 The specimen shall be a piece of leather 1 by 8 in. (25 by 200 mm). Note the direction of the long axis relative to the backbone.

5. Procedure

5.1 Punch a 3⁄16-in. (4.76-mm) hole on the long axis of the specimen 3 in. (76.2 mm) from one end.

5.2 Measure the thickness of the specimen to the nearest 0.5 oz (0.2 mm) of the long axis between the hole and the short end. Place the gage foot adjacent to, but not overlapping, the hole.

5.3 Fit the specimen in the buckle with the tongue of the buckle in the hole and the short end of the specimen under the keeper. Clamp the other end of the specimen in one of the testing machine grips so that the hole is approximately 3 in. (76 mm) from the grip. Clamp the free end of the buckle strap in the other grip. Operate the machine at 10 ± 2 in. (254 ± 50 mm)/min until the specimen begins to tear. At that instant, note and record the load registered by the machine.

6. Report

6.1 The report shall include the following:

6.1.1 The thickness of the sample which shall be the average of the thickness measurements of the specimens, reported to the nearest 0.5 oz (0.2 mm),

6.1.2 The buckle tear strength of the sample which shall be the average of the loads for the specimens, reported to the nearest 1 lb (0.45 kg), and

6.1.3 The direction of the long axis relative to the backbone.

7. Precision and Bias

7.1 This test method is adopted from the procedures of the American Leather Chemists Association where it has long been in use and where it was approved for publication before the inclusion of precision and bias statements were mandated. The original interlaboratory test data is no longer available. The user is cautioned to verify by the use of reference material, if available, that the precision and bias of this test method is adequate for the contemplated use.

8. Keywords

8.1 buckle tear; leather; strength; tear; tear strength