



Standard Practice for Calculation of (Non-Mineral) Combined Tanning Agents and Degree of Tannage¹

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This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This practice covers the determination of the combined tannin and nonextractable organic resins and the degree of tannage of all types of vegetable-tanned leather and leather with organic retannages. This practice does not apply to wet blue.

2. Referenced Documents

2.1 *ASTM Standards*:²

D2868 Test Method for Nitrogen Content (Kjeldahl) and Hide Substance Content of Leather, Wet Blue and Wet White

D2875 Test Method for Insoluble Ash of Vegetable-Tanned Leather

D2876 Test Method for Water-Soluble Matter of Vegetable-Tanned Leather

D3495 Test Method for Hexane Extraction of Leather

3. Significance and Use

3.1 This practice may be used to determine non-protein or non-nitrogen containing organic matter in leather which is not extractable with water or hexane. Examples would be vegetable tannins and acrylic lubricants.

4. Procedure

4.1 The chloroform and water extractable materials and insoluble ash in the specimen for test shall be determined in accordance with Test Methods D2875, D2876, and D3495.

4.2 The hide substance in the specimen for test shall be determined in accordance with Test Method D2868.

¹ This practice is under the jurisdiction of ASTM Committee D31 on Leather and is the direct responsibility of Subcommittee D31.01 on Vegetable Leather.

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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.

5. Calculation of Results

5.1 The percentage of combined tannin in the specimen shall be calculated as follows:

$$\text{Combined tannin, percent} = 100 - (A + B + C + D) \quad (1)$$

where:

A = percent of chloroform-soluble material (mfb),
B = percent of water-soluble material (mfb),
C = percent of insoluble ash (mfb), and
D = percent of hide substance (mfb).
(mfb) = moisture free basis.

5.2 The degree of tannage shall be calculated as follows:

$$\text{Degree of tannage} = \frac{T}{D} \times 100 \quad (2)$$

where:

T = percent of combined tannin, and
D = percent of hide substance.

6. Report

6.1 The combined tannin in the specimen shall be reported to the nearest 0.1 %.

6.2 The degree of tannage in the specimen shall be reported to the nearest 0.5°.

7. Precision and Bias

7.1 This practice is adopted from Federal Test Standard No. 311 Method 6631, where it has long been in use and was approved for publication before the inclusion of precision and bias statements was mandated. The user is cautioned to verify by the use of reference materials, if available, that the precision and bias (or reproducibility) of this practice is adequate for the contemplated use. The user should also consider precision and bias statements from each of the methods used to make this calculation.

8. Keywords

8.1 combined tannins; degree of tannage; leather; tannin analysis; vegetable-tanned leather

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