



Standard Test Method for Insoluble Ash of Vegetable-Tanned Leather¹

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1. Scope

1.1 This test method covers the determination of the insoluble ash in all types of vegetable-tanned leathers. 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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D2617 Test Method for Total Ash in Leather

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

3. Summary of Test Method

3.1 The specimen from which the water-soluble matter has been removed is heated at $600 \pm 25^\circ\text{C}$ until carbon is removed and constant weight is attained. The weighed residual matter is termed “insoluble ash” and is calculated as a percentage of the original sample.

4. Significance and Use

4.1 This test method gives the amount of ash remaining in the specimen after water extraction to remove water solubles from the leather in accordance with Test Method D2876. The insoluble ash is used in calculating the combined tannin because it is part of the tanned fiber structure that does not leach from the leather during water extraction.

¹ This test method is under the jurisdiction of ASTM Committee D31 on Leather and is the direct responsibility of Subcommittee D31.01 on Vegetable Leather. This test method was developed in cooperation with the American Leather Chemists Assn.

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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. Apparatus

5.1 *Crucible*, porcelain or platinum, large enough to hold the leather specimen.

5.2 *Electric Muffle Furnace*, with temperature controller and pyrometer, capable of maintaining a temperature of $600 \pm 25^\circ\text{C}$.

6. Test Specimen

6.1 The specimen shall consist of the 5-g leather sample remaining after water extraction as directed in Test Method D2876. Any deviation from this sample size should be included with the analytical results.

7. Procedure

7.1 Remove the specimen quantitatively from the extraction tube, dry at room temperature, transfer to the crucible, place in a cold muffle furnace, and ash at $600 \pm 25^\circ\text{C}$ until the crucible and contents have reached constant weight as directed in Test Method D2617. Remove the crucible to a desiccator, cool, and weigh.

8. Calculation

8.1 Calculate the percentage of insoluble ash in the leather as follows:

$$\text{Insoluble ash, \%} = [(W_3 - W_2)/W_1] \times 100 \quad (1)$$

where:

W_1 = weight of specimen (15 g),

W_2 = weight of the crucible, and

W_3 = weight of the crucible plus ash.

9. Precision and Bias³

9.1 The precision of this test method is limited by the lack of homogeneity of the sample in a complex material such as leather. It will also vary with the insoluble ash content.

9.1.1 At the 95 % confidence level, duplicate determinations by the same operator should not differ by more than 0.1 % insoluble ash.

9.1.2 At the 95 % confidence level, the average of duplicate determinations in each of two laboratories by different operators should not differ by more than 0.1 % insoluble ash.

³ Supporting data have been filed at ASTM International Headquarters and may be obtained by requesting Research Report RR:D31-1000.

9.2 Inasmuch as all leathers contain an unknown amount of natural or inherent ash, no meaningful statement can be made with respect to bias.

10. Keywords

10.1 ash content; insoluble ash; leather; vegetable tanned leather

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