



Designation: D6016 – 06 (Reapproved 2012)

## Standard Test Method for Determination of Nitrogen, Water Extractable in Leather<sup>1</sup>

This standard is issued under the fixed designation D6016; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This test method covers quantitatively determining the water extractable nitrogen in leather.

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:*<sup>2</sup>

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

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

D3495 Test Method for Hexane Extraction of Leather

D3790 Test Method for Volatile Matter (Moisture) of Leather by Oven Drying

2.2 *Federal Standard:*

Federal Test Standard No. 311, Method 6452 Nitrogen, Water Extractable<sup>3</sup>

### 3. Significance and Use

3.1 This test method provides the means to determine nitrogen containing water extractable materials such as excess and loosely bound tannins, ammonium salts, and nitrates.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D31 on Leather and is the direct responsibility of Subcommittee D31.06 on Chemical Analysis. This test method was developed from Federal Test Method Standard No. 311, Method 6452 in cooperation with the U.S. Army Natick Research Development & Engineering Center, Natick MA and the Defense Personnel Support Center Directorate of Clothing and Textiles, Philadelphia PA.

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<sup>2</sup> 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.

<sup>3</sup> Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

### 4. Apparatus

4.1 *Volumetric Flask*, 1 L.

4.2 *Kjeldahl Apparatus*, see Test Method D2868.

### 5. Reagents

5.1 See Test Method D2868.

5.2 See Test Method D3495.

5.3 See Test Method D2876.

### 6. Procedure

6.1 Follow the procedure for Test Method D3495. Save extracted leather and follow the procedure in 7.1 only of Test Method D2876.

6.2 When 1 L has been collected, cool the litre flask with contents to room temperature, readjusted up to 1 L with distilled water and mixed thoroughly. Transfer 500 mL of the solution to an 800-mL Kjeldahl flask. If using automated Kjeldahl instrumentation, sample size and quantity of reagents may need adjustment. Add 8 g of digestion catalyst (see Test Method D2868) and 20 mL of sulfuric acid (specific gravity 1.83) to the solution and the contents of the flask mixed thoroughly.

6.3 Digest the mixture over a low heat source until all organic matter is oxidized as indicated by the end of foaming and clearing of the solution. When foaming has ceased and the solution has cleared, apply full heat to the mixture and continue digestion for a minimum of 1 h. After digestion is complete, remove the flask from the heat, and allow to cool to room temperature. Then add 25 mL of 8 % sodium thiosulfate and set aside the flask for 5 to 10 min with occasional stirring.

6.4 Follow distillation and titration procedure in 7.3 of Test Method D2868.

### 7. Calculation

7.1 Calculate the water extractable nitrogen in the specimen as follows:

water extractable nitrogen (*moisture – free basis*), % (1)

$$= \frac{A \times N \times 0.014 \times 2 \times 100}{W \times \frac{(100 - M)}{(100)}}$$