



Designation: D 6016 – 96 (Reapproved 2001)

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

This standard is issued under the fixed designation D 6016; 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 approval. A superscript epsilon (ε) 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 given in SI units are to be regarded as the 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:

D 2868 Test Method for Nitrogen Content (Kjeldahl) and Hide Substance Content of Leather<sup>2</sup>

D 2876 Test Method for Water-Soluble Matter of Vegetable-Tanned Leather<sup>2</sup>

D 3495 Test Method for Hexane Extraction of Leather<sup>2</sup>

D 3790 Test Method for Volatile Matter (Moisture) of Leather by Oven Drying<sup>2</sup>

#### 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.

### 4. Apparatus

4.1 *Volumetric Flask*, 1 L.

4.2 *Kjeldahl Apparatus*, see Test Method D 2868.

### 5. Reagents

5.1 See Test Method D 2868.

5.2 See Test Method D 3495.

5.3 See Test Method D 2876.

### 6. Procedure

6.1 Follow the procedure for Test Method D 3495. Save extracted leather and follow the procedure in 7.1 only of Test Method D 2876.

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. Add 8 g of digestion catalyst (see Test Method D 2868) 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 D 2868.

### 7. Calculation

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

$$\begin{aligned} & \text{water extractable nitrogen (moisture-free basis), \%} \\ &= \frac{A \times N \times 0.014 \times 2 \times 100}{W \times \frac{(100 - M)}{(100)}} \end{aligned} \quad (1)$$

where:

A = of standard acid (corrected for blank) required to titrate the specimen, mL,

N = normality of the standard acid,

W = weight of the specimen, g, and

<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—General. 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> *Annual Book of ASTM Standards*, Vol 15.04.

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