Designation: D 6017 – 97 (Reapproved 2003)

Standard Test Method for Determination of Magnesium Sulfate (Epsom Salt) in Leather[1]

This standard is issued under the fixed designation D 6017; 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.

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

1. Scope

1.1 This test method covers quantitatively determining the magnesium sulfate (epsom salt) 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 3790 Test Method for Volatile Matter (Moisture) of Leather by Oven Drying[2]

2.2 *Federal Standards:*

Federal Test Standard No. 311, Method 6541 Magnesium Sulfate (Epsom Salt)[3]

3. Significance and Use

3.1 This test method distinguishes magnesium sulfate from other water soluble non-tanning salts found in leather.

4. Apparatus

4.1 *Platinum Crucible.*

4.2 *Filtering Crucible.*

4.3 *Suction Flask.*

4.4 *Muffle Furnace.*

5. Reagents

5.1 *Hydrochloric Acid*, specific gravity 1.19.

5.2 *Nitric Acid*, specific gravity 1.42.

5.3 *Ammonium Chloride.*

5.4 *Ammonium Hydroxide*, 1 to 1 and 1 to 9 parts by volume with distilled water.

5.5 *Ammonium Nitrate Solution*, 10 g dissolved in distilled water and made up to 100 mL.

5.6 *Ammonium Oxalate*, saturated solution.

5.7 *Ferric Chloride Solution*, 10 g dissolved in distilled water and made up to 100 mL.

5.8 *Methyl Orange Indicator*, 0.05 %.

5.9 *Sodium Ammonium Hydrogen Phosphate*, saturated solution.

6. Procedure

6.1 Unless otherwise specified in the material specification, determine the moisture content of the composite sample from which the test specimen is drawn, in accordance with Test Method D 3790. Determine the weight of the composite specimens for moisture content at the same time and under the same ambient conditions as the specimens weighed for chemical tests.

6.2 Place the specimen in a tared porcelain crucible, 5 g weighed to the nearest 0.001 g, and record the value as W_2. Place the weighed specimen in a cold muffle furnace or precarbonize over a burner prior to placing in a hot furnace. Gradually raise the temperature of the furnace to 600 ± 25°C and maintain at this temperature for 60 min. Remove the crucible and contents, cool in a desiccator, and weigh. Replace in the furnace at 600 ± 25°C for 30 min and repeat the cooling and weighing procedure until a constant weight is obtained (± 0.01 g). If it is difficult to obtain a constant weight, leach the residue with hot distilled water and filter through an ashless filter paper. Place the filter paper in the crucible and ash. Add the filtrate to the crucible and evaporate. The crucible shall then be put back in the muffle furnace and heated, cooled, and weighed as above until a constant weight (± 0.01 g) has been obtained.

[1] 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 6541 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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[2] *Annual Book of ASTM Standards*, Vol 15.04.

[3] Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.