Designation: D4653 – 87 (Reapproved 2015)

Standard Test Method for Total Chlorides in Leather[1]

This standard is issued under the fixed designation D4653; 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 U.S. Department of Defense.

1. Scope

1.1 This test method is intended for use in determining total chlorides in mineral tanned 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:*[2]

D2813 Practice for Sampling Leather for Physical and Chemical Tests

3. Significance and Use

3.1 This test method is used to determine amount of soluble chlorides in leather.

4. Apparatus

4.1 *Volumetric Flask,* 250 mL.

5. Reagents

5.1 *Acetic Acid Solutions*—5 or 10 % by volume.

5.2 *Methyl Orange*—0.02 % solution in 50 % alcohol.

5.3 *Ammonium Hydroxide Solution,* (0.1 *N*).

5.4 *Silver Nitrate, Standard Solution,* (0.1 *N*).

5.5 *Potassium Chromate Solution,* 5 %.

6. Sampling, Test Specimens and Test Units

6.1 The test specimen shall consist of 1 g of leather from the composite sample in accordance with Practice D2813.

6.2 Two specimens from the composite sample shall be tested.

7. Procedure

7.1 Weigh the specimen to the nearest milligram and record the value as *W*. Transfer the specimen to a 250 mL volumetric flask and add 200 mL of 0.1 *N* ammonium hydroxide solution. Immerse the flask up to the neck in a bath of boiling water. Thoroughly wet all particles by occasional swirling. After 2 h, cool the flask to room temperature and make the flask up to volume with distilled water, shake and without delay filter through a folded filter paper.

7.2 Discard the first 20 to 25 mL of the filtrate. Pipette 200 mL of the filtrate into a 600 mL beaker, add a few drops of methyl orange indicator and neutralize with 5 % acetic acid to an orange color. Add 2 to 3 mL of 5 % potassium chromate and titrate the solution with 0.1 *N* silver nitrate. Record the millilitre of silver nitrate as A. Titrate 200 mL of distilled water containing a few drops of methyl orange indicator and 2 to 3 mL of 5 % potassium chromate with 0.1 *N* silver nitrate as a blank and the millilitre of silver nitrate used and recorded as B.

8. Calculation of Results

8.1 Calculate the percent total chlorides as follows:

$$\textit{total chlorides}, \% = (A - B)N/W \times 0.0355 \times 250/200 \times 100 \quad (1)$$

where:

A = millilitres of standard silver nitrate used for titrating the sample,
B = millilitres of standard silver nitrate used for titrating the blank,
N = normality of the standard silver nitrate, and
W = weight of the specimen.

8.2 The total chlorides in the sample for test shall be the average of the test result obtained from the specimens tested.

9. Report

9.1 Unless otherwise specified in the detail specification, the result shall be reported to the nearest 0.1 %.

[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.

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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.

10. Precision and Bias

10.1 This test method is adopted from the procedures of the American Leather Chemists Association where it has long been in use and where it was approved for publication before the inclusion of precision and bias statements were mandated. The original inter-laboratory test data is no longer available. The user is cautioned to verify by the use of reference materials, if available, that the precision and bias of this test method is adequate for the contemplated use.

11. Keywords

11.1 mineral tanned leather; total chlorides