



Standard Test Method for Alkali-Solubility of Wools¹

This standard is issued under the fixed designation D 1283; 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.

1. Scope

1.1 This test method covers a chemical procedure for determination of the amount of wool substance soluble in alkali under standard conditions and is applicable to wool in scoured fiber form, or as fiber obtained from yarn or from woven or nonwoven fabric.

1.2 The values stated in inch-pound are to be regarded as standard. The values stated in SI units are provided for information only.

NOTE 1—This test method is applicable to other animal fibers although the level of alkali-solubility may be different from wool. With individual animal fibers, undamaged solubility should be determined before attempting to assess damage on an unknown sample.

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 123 Terminology Relating to Textiles²

D 1060 Practice for Core Sampling of Raw Wool in Packages for Determination of Percentage of Clean Wool Fiber Present²

D 1193 Specification for Reagent Water³

E 1 Specification for ASTM Thermometers⁴

E 11 Specification for Wire-Cloth Sieves for Testing Purposes⁵

3. Terminology

3.1 Definitions:

3.1.1 *alkali-solubility, n*—in wool, the percent of clean wool that is soluble in a specified alkaline solution under controlled conditions of temperature and time.

3.1.2 *wool, n*—the fibrous covering of the sheep, *Ovis* species.

3.1.3 For definitions of textile terms used in this test method, refer to Terminology D 123.

4. Summary of Test Method

4.1 Specimens are maintained at a stipulated constant temperature in a caustic solution for a specified period of time. The percentage of alkali-solubility is calculated from the loss in mass of the specimen.

5. Significance and Use

5.1 Alkali-solubility is an indication of the degree of damage to wool resulting from certain chemical treatments, particularly when test results on the same wool, before such treatment, are available.

5.1.1 Undamaged scoured wool has typical alkali-solubility in the range of 9 to 15 %. Fine, undamaged wool normally will exhibit higher solubility than coarse wool, because of greater surface area per unit mass of fiber.

5.2 This test method is not recommended for use on wool known to have sustained alkali damage.

5.2.1 Alkali-damaged wool has had material solubilized that ordinarily would be included in the alkali-solubility test results.

5.3 Although results in one laboratory cannot usually be verified in another laboratory, this test method is considered satisfactory for acceptance testing because it has been used extensively in the trade for this purpose and because it is the only available method for assessing damage to wool by an alkali solubility procedure. Comparative tests as directed in 5.3.1 are advisable before Test Method D 1283 is used for acceptance testing.

5.3.1 In case of a dispute arising from differences in reported test results when using Test Method D 1283 for acceptance testing of commercial shipments, the purchaser and the supplier should conduct comparative tests to determine if there is a statistical bias between their laboratories. Competent statistical assistance is recommended for the investigation of bias. As a minimum, the two parties should take a group of test specimens which are as homogeneous as possible and which are from a lot of material of the type in question. The test specimens should then be randomly assigned in equal numbers to each laboratory for testing. The average result from the two laboratories should be compared using Student's t-test for unpaired data and an acceptable probability level chosen by the two parties before testing is begun. If a bias is found, either its cause must be found and corrected or the purchaser and the

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² Annual Book of ASTM Standards, Vol 07.01.

³ Annual Book of ASTM Standards, Vol 11.01.

⁴ Annual Book of ASTM Standards, Vol 14.03.

⁵ Annual Book of ASTM Standards, Vol 14.02.