



Designation: D2654 – 22

Standard Test Methods for Moisture in Textiles¹

This standard is issued under the fixed designation D2654; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 These test methods cover measurement of moisture in textile materials as (1) moisture content or pick-up using ambient air for oven-drying, (2) moisture content or pick-up using standard atmosphere for testing textiles for oven-drying, (3) moisture content or pick-up at moisture equilibrium, and (4) moisture regain. These test methods are applicable to all fibers natural or man-made, and in all forms from fiber or filament to finished fabric, subject to the limitations set forth in 1.1.1 through 1.1.4. Blends of fibers shall also be tested by these methods.

1.1.1 *Procedure 1*—This oven-drying technique, using ambient air heated to 105 °C, shall be used in any situation in which a simple and convenient method for routine process control or when in-plant evaluation is needed to determine an approximation of the moisture content or pickup. It is not recommended for jute or grease wool, or for acceptance testing in commercial transactions.

1.1.2 *Procedure 2*—Oven-drying technique, using air from the standard atmosphere air for testing textiles that is heated to 105 °C and other refinements in technique, shall be used as a basis for commercial transactions for all materials for which it is known that no significant quantity of non-aqueous volatile matter is present on, or in, the material to be tested.

NOTE 1—The air supply for Procedure 2 has been changed from desiccated air to the air from the standard atmosphere for testing textiles because the latter is in common use and is prescribed in Test Method D494 for commercial mass of a shipment. By agreement, however, desiccated air may be used.

1.1.3 *Procedure 3*—This oven-drying technique uses specimens in moisture-equilibrium under specified conditions and an oven with an air supply of specified temperature and relative humidity heated to 105 °C, and other refinements in technique. The procedure is used to determine the moisture content or pickup of a material in equilibrium conditions, usually the standard atmosphere for testing textiles.

¹ These test methods are under the jurisdiction of ASTM Committee D13 on Textiles and are the direct responsibility of Subcommittee D13.51 on Conditioning, Chemical and Thermal Properties.

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NOTE 2—The previous Procedure 3 for determining moisture using distillation with toluene has been dropped from this method because it is essentially the same as Test Method D2462 which is the preferred method for jute and grease wool in any circumstance. Test Method D2462 is the preferred method for any material in which it is known, or suspected, that a significant quantity of nonaqueous and non-water miscible volatile matter is present.

1.1.4 *Procedure 4*—This new technique is for determination of actual moisture regained by a material under specified conditions after the material has been extracted by a suitable procedure, if surface materials are present, and dried in vacuum at a low temperature

1.2 In Procedures 1, 2, and 3, alternative techniques are described for weighing oven-dried specimens: in the oven while hot, and outside the oven at room temperature.

1.3 The word *water* refers to the chemical compound H₂O. The terms *water* and *moisture* are frequently used interchangeably in the literature and in the trade even when the “moisture” is known to contain other volatile materials. When the loss during oven exposure is not known to be all water, it shall be considered a “volatiles loss” rather than a “moisture loss” for technical accuracy.

1.4 Moisture calculations commonly involve the mass of a specimen that has been dried by heating in an oven. If the air in the oven contains moisture, the oven-dried specimen will contain moisture (in equilibrium with that in the oven air) even when it no longer shows a significant change in mass. Therefore, if a very precise measurement of the moisture present is required and oven drying is used, the mass must be exposed to desiccated air until it shows no further significant change in mass.

NOTE 3—Other ASTM Standards related to the determination of moisture of textile materials are Test Methods D1576, D2495, and D2118.

1.5 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

1.6 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the*