



Standard Test Method for Moisture Content of Paper and Paperboard by Oven Drying¹

This standard is issued under the fixed designation D 644; 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 the determination of the moisture in all papers, paperboards, and paperboard and fiberboard containers, except those containing matter other than water that is volatile at 105°C.

1.2 *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.*

NOTE 1—This test method is technically equivalent to TAPPI T 412 – 83.

2. Referenced Documents

2.1 ASTM Standards:

D 585 Practice for Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, or Related Products²

3. Significance and Use

3.1 The moisture content of paper and paperboard may affect the purchase cost and can also have an effect upon the performance of the paper in a given application since moisture content can affect properties including, but not limited to tensile strength, tearing resistance, dimensional instability, permanence, printability, flexibility, and runability on various types of paper processing machinery and equipment. Knowledge of moisture content is necessary to calculate, to a dry basis, analytical results obtained from test specimens weighed at ambient or conditioned moisture content.

4. Apparatus

4.1 *Weighing Container*, airtight, for weighing the specimen before and after drying. A glass weighing bottle with a ground stopper is suitable for specimens of the order of 2 g. The weighing bottle may be of either high or low form; a volume

of about 100 mL is appropriate. An airtight metal container, preferably containing a light-weight large-mesh wire basket, is suitable for larger specimens, particularly those over 10 g.

4.2 *Thermometer*, to indicate the temperature of the drying oven. This thermometer shall include the temperature range from 100 to 110°C, and its scale shall be divided in 1° intervals.

4.3 *Drying Oven*, constant-temperature, equipped with means for ensuring adequate temperature control and air circulation, a means to separate the heating coils from the sample containment area (generally the oven bottom plate), and preferably equipped with means for drying the air entering the oven.

4.4 *Chemical Balance*, sensitive to 1 mg, for weighing specimens of 2 g and under, and sensitive to 0.05 % of the original weight of the specimen for larger specimens.

4.5 *Desiccator*, in which weighing containers and specimens are cooled after drying. It is recommended that anhydrous alumina (indicator grade) be used as the desiccant.

5. Test Specimens

5.1 When moisture is determined for the purpose of calculating the results of a chemical analysis of paper or board on a moisture-free basis, the test specimens shall weigh not less than 1 g, and preferably not less than 2 g each. At the time of initial weighing, these specimens shall be in moisture equilibrium with the samples being analyzed.

5.2 When moisture is determined for the purpose of calculating the amount of moisture in a shipment, the test specimens shall weigh not less than 50 g each, and shall be taken from samples obtained in accordance with Practice D 585.

5.3 When moisture is determined on combined board or containers that are to be tested for other physical properties, test specimens shall weigh approximately 50 g, and shall be taken so as to be representative of the material being tested. In the case of containers, specimens shall be cut from unsealed sections, and preferably from unprinted sections, of the container, and shall be taken from each type of container being tested.

¹ This test method is under the jurisdiction of ASTM Committee D06 on Paper and Paper Products and is the direct responsibility of Subcommittee D06.92 on Test Methods.

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² *Annual Book of ASTM Standards*, Vol 15.09.