



Designation: D585 – 97 (Reapproved 2007)

An American National Standard

Standard Practice for Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, and Related Product¹

This standard is issued under the fixed designation D585; 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 practice covers a procedure for obtaining a sample to represent a lot of paper or paperboard, fiberboard, or related product, including converted paper products (all hereafter referred to as *paper*).

1.2 Prior to purchase, there should be agreement between buyer and seller on the size of the lot to be sampled (5.1), on details of the sampling procedure, the required physical and chemical properties, dimensional tolerances, etc., and the test methods to be employed.

1.3 Appendix X1 and Appendix X2, which provide useful, statistical criteria for accepting individual lots of paper on the basis of the number of defective test units, can assist the buyer and the seller in selecting an agreed-upon sampling and acceptance procedure.

1.4 *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

D528 Test Method for Machine Direction of Paper and Paperboard

D1968 Terminology Relating to Paper and Paper Products

D5039 Test Methods for Identification of Wire Side of Paper³

2.2 ISO Standard:

ISO 186 Paper and Board—Sampling for Testing⁴

2.3 Military Standards:⁵

MIL-STD-105D Sampling Procedures and Tables for Inspection by Attributes

MIL-STD-414 Sampling Procedure and Table for Inspection by Variables for Percent Defective

3. Terminology

3.1 *Definitions*—Definitions shall be in accordance with Terminology D1968 and the Dictionary of Paper.⁶

4. Significance and Use

4.1 If a lot of paper is to be accepted or rejected on the basis of a series of tests made on the paper, it is important to sample the paper in a way that will give a test result that is representative of the lot of paper.

5. Establishing the Lot

5.1 *General Considerations*—Avoid grouping together as a lot batches of paper likely to differ significantly from each other in raw materials or manufacture. If the shipment is small or consists of a large number of batches, it may be uneconomical or impracticable to form lots conforming with the definition (3.1). If this is the case, divide the shipment into portions, to be designated “sublots,” in which each portion conforms to the definition of *lot*. Before starting the sampling, obtain a complete understanding of the paper to be sampled, including the composition and size of lots and sublots, rolls, skids, etc.

5.2 Location of Sampling:

5.2.1 *Sampling at the Paper Mill*—When paper is to be delivered in large rolls or skids, if agreed, have the sample taken at the paper mill and delivered to the purchaser for examination and testing. Include in the purchase agreement a definition of the number of rolls or skids constituting a lot and

¹ This practice is under the jurisdiction of ASTM Committee D06 on Paper and Paper Products and is the direct responsibility of Subcommittee D06.92 on Standard Documents Relating to Paper and Paper Products.

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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.

³ Withdrawn. The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁵ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://www.dodssp.daps.mil>.

⁶ Available from Technical Association of the Pulp and Paper Industry (TAPPI), 15 Technology Parkway South, Norcross, GA 30092, <http://www.tappi.org>.

details of the sampling procedure to ensure compliance with the rules in selecting the sample in accordance with Section 6. Especially indicate whether the sample was taken from mill reels or from the finished rolls or skids.

5.2.2 Sampling in Transit or Warehouse—It may be necessary to take a sample at a dock or warehouse en route between the supplier and the purchaser, especially for international shipments or in referee sampling for testing. Sampling in transit or warehouse can be quite expensive and should be avoided whenever possible, because of the problem of resealing. Arranging to inspect the shipment prior to unloading is recommended on inspection in transit. Establish the size of each lot and determine which rolls or skids will be sampled, and arrange to sample and reseal the rolls or skids as they are loaded or unloaded to minimize additional handling. Obtain the sample in accordance with Section 6.

5.2.3 Sampling After Receipt—This type of sampling has the obvious disadvantage of delaying evaluation of the shipment and of providing the least favorable conditions for disposal of a rejected lot. Other considerations are the same as above for sampling in transit.

5.3 Representativeness of the Sample—The test units of the sample usually cannot be taken at random from anywhere within a large roll or skid, but must be taken near the outer layers so as not to destroy the roll or skid. If such test units are regularly taken at the paper mill (5.2.1) and a reasonably uniform quality of production is being maintained, then the test units will, in the long run, be quite representative of average production, even though not randomly selected and therefore not “representative” from a statistical viewpoint. Such test units, however, taken when the lot is in transit or warehouse (5.2.2) or after receipt (5.2.3), cannot be said with certainty to be representative of the shipment; for example, rolls shipped to a customer may have been selected because their outer layers met the customer’s specification, with no knowledge as to whether properties vary from the outer layers to the core of the roll. Such test units therefore may be neither random nor “representative,” but they are all that is available “to represent” the lot, which experience shows they do fairly well unless nonuniform manufacture or aging has occurred.

6. Selecting Sample

6.1 Determine the area of paper required for each test unit (see 3.3) and the number of test units required. Take a sample consisting of the required number of test units in accordance with a predetermined procedure, designed to eliminate deliberate selection of any particular area of paper (see X1.5), and as far as practicable, conforming to the following rules:

6.1.1 Rule 1: Take test units in proportion to the sizes of the sublots—When a lot divides naturally into sublots consisting of discrete quantities such as carloads, pallet loads, rolls, etc., or when certain portions of the lot differ from one another and are segregated as “sublots” (5.1), take the test units in such a way that the number of test units taken from a given sublot is proportional to the size of the sublot.

6.1.2 Rule 2: Take the test units so that each area of paper in the lot or sublot has an equal probability of being selected—It is recognized that difficulties of handling may not

permit the taking of test units from locations scattered throughout the lot, but this should be done to the greatest practicable extent.

6.1.3 Rule 3: Take test units indiscriminately—Take the units without regard to their condition or quality but do not sample the outermost sheets of a roll or skid. Also do not sample from inner sheets that have been damaged by handling, abrasion, etc., unless it is evident that similarly damaged areas occur throughout the lot.

6.2 Compliance with Rules 2 and 3 may be assured in accordance with the following procedure: Divide the lot or sublot into “locations” (carloads, skids, cartons, etc.) in such a way that each location contains an equal quantity of paper. Assign a number to each location and select the locations to be sampled by drawing numbers at random from a hat or from a table or random numbers. Next assign and select the sublocations or areas within a location by the same procedure. In order to minimize handling during sampling, observe the precautions of Section 5.

6.2.1 When test units are to be taken from *small rolls, reams, bundles, cartons or shipping containers* of completed paper products, divide the lot or sublot into “locations,” etc., and proceed as described above.

6.2.2 When test units are to be taken from *large rolls or skids*, divide the lot or sublot into “locations” and “sublocations” no smaller than a roll or unopenable skid (see 6.3.2), assign and select numbers as described above, then proceed as described in 6.3.

NOTE 1—In ISO and British Standards, the word *reel* is used for a continuous sheet or board wound on a core and the word *roll* for the same when wound without a core. In the United States, the distinction is between the “reel” at the end of the paper machine and the “rolls” (with or without the cores) made therefrom.

6.3 Large Rolls or Skids:

6.3.1 When taking a test unit from a *large roll* remove all damaged layers from the outside of the roll and, in addition, discard at least three undamaged layers for sheets having a nominal grammage of less than 250 g/m² or at least one undamaged layer for heavier sheets. Cut the roll across its full width and to a sufficient depth to enable the requisite number of sheets to be taken. Let the cut sheets fall to each side and remove the roll.

6.3.2 When taking a test unit from a *skid or roll that may not be opened* at the time of sampling, cut a window 300 by 450 mm or larger if larger test specimens are required. Cut the window with its longer side in the machine direction when this is known, or if not known, mark “Direction Unknown” or determine the machine direction using Test Method D528 and mark whether the machine direction is the short dimension or long dimension. For paper that has been sheeted simultaneously from several rolls, take a sufficient number of adjacent sheets to assure representation of all the rolls used. Cut the sheets to sufficient depth to enable the requisite number of sheets to be taken and remove them. Remove all outside sheets that are damaged and, in addition, discard at least the three outermost undamaged sheets for paper having a nominal grammage less than 250 g/m² or at least one outermost undamaged sheet of heavier paper. Vary the position of the window