

TESTING STANDARDS AND DEFINITION OF TERMS

General information: The methods given in this Part of the Standards are required to be used in measuring the characteristics of papers that are specified in Part 1, Specifications. Alpha-numeric citations of methods refer to the methods of the Technical Association of the Pulp and Paper Industry, unless otherwise indicated. Testing laboratories are advised to provide themselves with current editions of all methods. Methods of the Technical Association of the Pulp and Paper Industry (TAPPI) can be obtained from TAPPI, P.O. Box 105113, Atlanta, GA 30348 (www.tappi.org). Methods of the American Society for Testing and Materials (ASTM) can be obtained from the Society, 100 Barr Harbor Drive, West Conshohocken, PA 19428 (www.astm.org). Sources of other methods are given in the text.

Paper suppliers are required to make such tests as may be necessary, to ensure the delivery of finished paper fully complies with the applicable specifications and standard samples. When requested by the procuring office, copies of the records developed by the paper supplier in making such tests shall be furnished. All paper, including paper in the manufacturing process, are subject to inspection as authorized or required by the contracting office.

Abrasion: Use method T-476.

Absolute moisture: Use method T-412.

Acidity (pH): (A) For uncoated papers, unless otherwise stated, use method T-435. For test, weigh a specimen of 1.8 g and add 125 ml of distilled water. (B) For paper coating, use T-435, except prepare the test specimen as follows: Using a razor blade, scrape the coating from an area of 5 paper specimens until a sample weighing 0.12 g is accumulated. Place the sample in a clean beaker, add 50 ml of distilled water, let sit, and soak for one hour. (C) For cold extraction, use method T-509.

Alkaline paper: Paper having a pH value greater than 7; made by an alkaline manufacturing process.

Alpha cellulose: Use method T-429.

ANSI: American National Standards Institute, 11 West 42nd Street, New York, NY 10036 (www.ansi.org).

Basis weight (weight per unit area): See grammage.

BCTMP: Bleached "Chemi-Thermo-Mechanical pulp" (CTMP) is pulp that has been bleached to a higher brightness, e.g. >80%. CTMP is a pulp produced from chemically impregnated wood chips, by means of pressurized refining at high consistency.

Bleached: Papermaking fibers treated chemically in order to whiten, purify, and stabilize the fibers.

Blocking: Use method D-918 of ASTM with the following modifications. Take rectangular specimens 4.5 by 6 cm. Use a top plate and weight such that the total mass is equivalent to 70 g/cm² on the specimens for uncoated paper, and 9 g/cm² for coated paper. Prepare the specimens by soaking in water at 25 ± 5 °C for 15 minutes, taking care that the water has free access to both sides of each specimen, then removing the specimens from the water and shaking each one gently to remove excess water from the surface. After stacking, allow the assembly to dry at 25 ± 5 °C.

Brightness: Use method T-452.

Bursting strength: (A) For papers having bursting strengths not more than 1380 kPa (200 lb/in²), use method T-403. (B) For papers having bursting strengths more than 1380 kPa (200 lb/in²), and for boards, use method T-807. (C) For wet bursting strength, heat the cut specimens in an oven 105 °C for 15 minutes, immediately soak them in water at 23 ± 2 °C for 60 minutes, blot them in accordance with method T-456, and test them at once by method T-403 or T-807, as appropriate.

Calcium carbonate: See filler.

Chemical pulp: Wood chips treated with chemicals to remove impurities such as lignin, resins, and gums. There are two basic types, sulfite and sulfate (kraft), and variations of these. Also see stock.

Chlorine-free: A term used to describe a bleaching technology used in manufacturing pulp and paper. Two terms are often used in connection with a chlorine-free paper. They are "elemental chlorine-free" (ECF) or "totally chlorine-free" (TCF). An ECF paper is made from pulp bleached with chlorine dioxide, but not elemental chlorine; whereas, TCF paper is made from

pulp bleached without using chlorine or chlorine compounds (and this includes the recycled fiber component of the paper).

Cleanliness: See dirt, speck.

Color by visual comparison: Use method T-515. Visual color assessments are made in a light booth with light sources having color temperatures of 5000 and 7500 kelvin. Overall matches are described as "fair plus," "fair," "fair minus," or "unacceptable."

Color by spectral reflectance: Use method T-524 and equations for CIELAB.

Color deviation and variation: Calculate using the CIELAB equations described in TAPPI TIS 0804-04. Measurements are made under the following conditions: Ill D65, 10° observer, and specular component included.

Conditioning for testing: Use method T-402. The atmosphere in the immediate vicinity of the testing machine shall be controlled to the required conditions during testing.

Copper number: Use method T-430.

Cotton fiber paper: Paper containing at least 25 percent or more fibers derived from lint cotton, cotton linters, and cotton or linen cloth cuttings. These papers fall in the broad category of papers containing "recovered material". See recovered material, (2)(ii), below.

Dealing with outlying test determinations: Use method T-1205.

Defects in paper by visual examination: Insofar as practicable, defects in paper which are determined by visual examination shall be classified and defined in accordance with "The Dictionary of Paper", 5th Ed. (1996) published by TAPPI.

Density: Measure the thickness of each specimen in "cm" in accordance with method T-411. Measure the weight per unit area of each specimen, in "g/cm²", in accordance with method T-410. Calculate the density of each specimen in "g/cm³". Report the average density for 5 specimens tested.

Dirt: Use method T-437.

ECF: See chlorine-free.

English equivalent:

Property	To convert from	To	Multiply by
Bursting strength ..	kPa (kilopascal)	lb/in ² (pound per square inch).	0.145
Grammage	g/m ² (grams per square meter).	Pounds (basis weight).	
		Basis size:	
		17 x 22	0.266
		20 x 26	0.370
		22½ x 28½ ...	0.456
		24 x 36	0.615
		25 x 38	0.676
		25½ x 30½ ...	0.553
Tearing strength ...	mN (millinewton)	g (gram)	0.102
Tensile strength	kN/m (kilonewton per meter).	kg/inch (kilogram per inch).	2.549
Temperature	C (Celsius)	F (Fahrenheit)	$t^{\circ}F = 1.8t^{\circ}C + 32$
Thickness	mm (millimeter)	inch	0.0394

Equilibrium relative humidity: Use method T-502.

Erasing quality: The term "erasing quality" shall be construed to mean the retention of good writing and typing quality and appearance of surface after complete erasure using a "hard" eraser for "ink", such as Eberhard Faber® Union 110, Faber Castell Eraser Stik® 7099B, Weldon Roberts No. 38, or equivalent, of ruled lines and written or typed characters. In addition for map paper, texture shall permit redrawing of sharp lines in ink after burnishing.

Executive Order 13101: "Greening the Government through Waste Prevention, Recycling and Federal Acquisition" issued on September 14, 1998, orders Federal agencies and departments to improve the Federal Government's use of recycled products and environmentally preferable products and services. For paper the following section is most relevant:

"Sec. 505. Minimum Content Standard for Printing and Writing Paper. Executive agency heads shall ensure that their agencies meet or exceed the following minimum materials content standards when purchasing or causing the purchase of printintg and writing paper: (a) For high speed copier paper, offset paper,