

## TESTING STANDARDS AND DEFINITION OF TERMS

forms bond, computer printout paper, carbonless paper, file folders, white wove envelopes, writing and office paper, book paper, cotton fiber paper, and cover stock, the minimum content standard shall be no less than 30 percent postconsumer materials beginning December 31, 1998. If paper containing 30 percent postconsumer material is not reasonably available, does not meet reasonable performance requirements, or is only available at an unreasonable price, then the agency shall purchase paper containing no less than 20 percent postconsumer material. The Steering Committee, in consultation with the AEEs, may revise these levels if necessary.

(b) As an alternative to meeting the standards in sections 505(a), for all printing and writing papers, the minimum content standard shall be no less than 50 percent recovered materials that are a waste material byproduct of a finished product other than a paper or textile product that would otherwise be disposed of in a landfill, as determined by the State in which the facility is located.

(c) Effective January 1, 1999, no executive branch agency shall purchase, sell, or arrange for the purchase of, printing and writing paper that fails to meet the minimum requirements of this section."

**Filler:** The percent (pct) calcium carbonate in the filler shall be determined as follows:

*Method.*—Weigh out approximately 1 g of paper to the nearest 1 mg, making a correction for the moisture content (Note 1), and place it in approximately 25 ml of water in a 125 ml Erlenmeyer flask. Pipet 20 ml (Note 2) of standardized 0.1 N HCl into the flask, heat to boiling, and boil for approximately 1 minute. Add 3 drops of aqueous methyl red. Cool to room temperature and titrate to the first lemon yellow with standardized 0.1 N NaOH solution.

If a trace of pink indicator remains adsorbed on the surface of the paper, boil the paper briefly to desorb the pink color. Usually a further drop of NaOH solution will restore the lemon yellow to the solution.

*Calculations.*—Calculate the carbonate content of the paper as percent calcium carbonate (CaCO<sub>3</sub>) as follows:

$$\text{CaCO}_3, \text{ pct} = \frac{[(\text{ml} \times \text{N})_{\text{HCl}} - (\text{ml} \times \text{N})_{\text{NaOH}}] \times 0.050}{g} \times 100$$

where 0.050 is the milliequivalent weight of CaCO<sub>3</sub> and g is the weight of the specimen. Duplicate determinations should agree within 0.3 pct CaCO<sub>3</sub>.

*Report.*—Report the carbonate content as percent CaCO<sub>3</sub> of the oven-dry paper to the nearest 0.1 pct.

Note 1—The specimen for analysis may be dried and weighed, or a separate portion may be used for moisture determination.

Note 2—For a 1 g specimen, 20 ml of 0.1 HCl is sufficient to neutralize the carbonate in a paper containing about 10 pct carbonate.

Note 3—This is not a direct determination of CaCO<sub>3</sub>, but a measure of alkalinity expressed as CaCO<sub>3</sub>. Other alkaline materials will affect the determination.

**Flap adhesive thickness:** Adhesive thickness shall be determined by subtracting the average thickness (T-411) of the ungummed portion of the flap from the average thickness of the gummed portion of the flap.

**Fluorescence:** See optical brightener.

**Folding endurance:** Use method T-423 (Schopper) or T-511 (M.I.T.). Report the average of not less than 5 measurements.

**Formaldehyde:** Use method 111, "Tentative Method of Analysis for Formaldehyde Content of the Atmosphere (Colorimetric Method)" (43502-01-69T), by the Intersociety Committee, *Methods of Air Sampling and Analysis*, American Public Health Association, Washington, D.C., 1972, pp 194-198. Additional information may be obtained from the Association, 1015 15th Street, N.W., Suite 300, Washington, DC 20005 (www.apha.org).

**Gloss:** Use method T-480 for 75° or T-653 for 20°.

**Grain:** See machine direction.

**Grammage:** Use method T-410.

**Groundwood pulp:** Papermaking fibers produced by mechanical means; does not include bleached chemi-thermo-mechanical pulps (BCTMP), a semi-chemical pulp. Also see stock.

**Ink absorbency:** Use method T-431.

**Light transmission:** Use method E-308 of ASTM.

**Lignin:** The percent (pct) lignin in paper shall be determined spectrophotometrically as follows:

(1) Remove the calcium carbonate filler from a 5 by 5 cm paper sample by placing it in hot (99 °C) 0.1 N HCl until effervescence is complete.

(2) Rinse paper sample with distilled water.

(3) Place sample in 85 °C oven (for a few minutes) until dry.

(4) Trim paper to fit the sample holder of spectrophotometer.

(5) Clamp the paper sample which has been moistened with a drop of tetrachloroethylene between the potassium bromide windows.

(6) Obtain an infrared (IR) spectrum by averaging 50 scans with a Fourier transform infrared spectrometer.

(7) IR spectral data must be expressed in "absorbance" rather than "transmittance". The background spectrum (air blank) should be no more than two hours old.

(8) Calculate lignin using the following equation:

$$\begin{aligned} &\text{pct lignin (of fibrous material)} \\ &= (L/C + 0.033) \times 132.45 \end{aligned}$$

where

L=the integrated area bounded by the IR absorption band and baseline from 1540 cm<sup>-1</sup> to 1490 cm<sup>-1</sup>

C=the integrated area bounded by the IR absorption band and baseline from 3000 cm<sup>-1</sup> to 2800 cm<sup>-1</sup>.

**Machine direction:** Use method T-409.

**Metric Conversion Act:** The P.L. 100-418 (The Omnibus Trade and Competitive Act of 1988) section 5164 designates the Metric system of measurement as the preferred system of weights and measures for the United States trade and commerce.

**Metric equivalent:**

Property	To convert from	To	Multiply by	
Basis weight .....	Pounds .....	g/m <sup>2</sup> (grammage or grams per square meter).		
			Basis size:	
			17 x 22 .....	3.759
			20 x 26 .....	2.704
			22½ x 28½ .....	2.193
			24 x 36 .....	1.627
Bursting strength ..	lb/in <sup>2</sup> (pound per square inch).	kPa (kilopascal)	6.895	
Tearing strength ...	g (gram) .....	mN (millinewton)	9.807	
Tensile strength ....	kg/inch (kilogram per inch).	kN/m (kilonewton per meter).	0.3923	
Temperature .....	F (Fahrenheit) .....	C (Celsius) .....	$t^{\circ}C = (t^{\circ}F - 32)/1.8$	
Thickness .....	inch .....	mm (millimeter)	25.40	

**Mimeograph quality:** See No. 9 *Government Paper Specification Standards* for details of this test.

**Minimum content standards:** The minimum percentage of recovered fiber recommended by the Environmental Protection Agency (EPA) for Federal procurement of paper and paper products and stated in the paper specification standard. This percentage is based on fiber weight. (Paper RMAN II, 63 FR 31214)

**NISO:** National Information Standards Organization, 4733 Bethesda Avenue, Suite 300, Bethesda, MD 20814. (www.niso.org).

**Oil holdout (of coating):** Use method T-462, except the end point shall be evaluated at 200 seconds. When viewing from the underside of the paper in the mirror, record the time it takes the oil to penetrate the coating or at 200 seconds: "did the oil penetrate the coating of the paper?" The report shall be the number of seconds it took the oil to penetrate the coating or ">200 s" if the oil does not penetrate the coating at 200 seconds. (Note: The endpoint for this test is not the same as the endpoint for oil penetration T-462.)

**Oil penetration:** Use method T-462.

**Opacity:** Use method T-425.

**Optical brightener:** Use method T-452, appendix C.

**Paper Products Recovered Materials Advisory Notice II (Paper RMAN II):** EPA guidance issued June 8, 1998 (63 FR 31214) for recovered fiber content in printing and writing paper.

**Permanent paper:** (A) A paper that can resist chemical and physical changes over an extended time period (several hundred years). This paper is generally acid free, has a fairly high initial strength, and will retain its strength over time.