

T 461 cm-09

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OFFICIAL TEST METHOD – 1984
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CAUTION:

This method may require the use, disposal, or both, of chemicals which may present serious health hazards to humans. Procedures for the handling of such substances are set forth on Material Safety Data Sheets which must be developed by all manufacturers and importers of potentially hazardous chemicals and maintained by all distributors of potentially hazardous chemicals. Prior to the use of this test method, the user should determine whether any of the chemicals to be used or disposed of are potentially hazardous and, if so, must follow strictly the procedures specified by both the manufacturer, as well as local, state, and federal authorities for safe use and disposal of these chemicals.

Flame resistance of treated paper and paperboard

1. Scope

1.1 This procedure describes a method for testing the flame resistance of paper and paperboard not over 1.6 mm (0.063 in.) in thickness that has been treated to prevent the spread of flame when ignited.

1.2 It also provides a parameter of quality and utility by distinguishing between paper or paperboard having a non-durable treatment (removed by leaching in water), designated as Type I, and paper or paperboard having a durable treatment (not removed by leaching in water), designated as Type II.

1.3 *Safety precaution.* This test method measures the resistance to flaming under specified test conditions. Any judgements regarding suitability for use in predicting end use applications of specific papers must be made by the user.

1.4 This test method does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Special attention should be given to the Material Safety Data Sheets (MSDS) of the gases used and to the manual for the use of the burner in 3.3.

2. Significance

The utility of paper and paperboard for many functional and decorative purposes requires resistance to the spread of flame. This method is useful in both qualitative and quantitative measurement of the flame resistance of paper and paperboard. Certain uses may also require a knowledge of the durability of the flame resisting treatments applied to paper and paperboard when exposed to water. Judicious analysis of the test data may be useful for design purposes in applications and fabrication of materials requiring flame resistant properties.

Approved by the Standard-Specific Interest Group for this Standard
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3. Apparatus

3.1 *Metal cabinet*¹ (Fig. 1), of sheet metal (or other noncombustible material), 305 × 355 mm (12 × 14 in.) at the base and 760 mm (30 in.) high, having a door provided with a transparent insert for observing the burning specimen. The top closure has a baffle plate 25 mm (1 in.) below the top. The top is vented by 16 holes of 12.5 mm (0.5 in.) diameter equally spaced. Each of the two sides is vented by eight holes 12.5 mm (0.5 in.) diameter with centers 25 mm (1.0 in.) above the base.

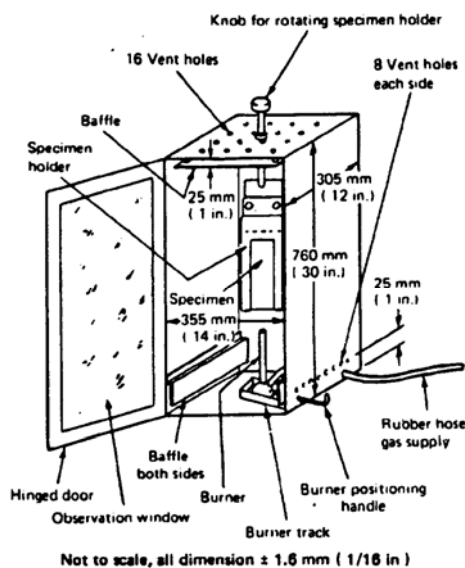


Fig. 1. Metal cabinet.

3.2 *Specimen holder*¹, an inverted U-shaped metal clamp suspended from the center of the cabinet, to hold a specimen 70 mm (2.75 in.) wide and 210 mm (8.25 in.) long, with the long axis vertical. The specimen is clamped vertically for its entire length at a distance of 10 mm (0.375 in.) in from the edges, to expose an area of 50 × 210 mm (2 × 8.25 in.). The holder is preferably attached to the top so that it can be rotated from the outside, permitting both sides of the specimen to be observed.

3.3 *Test flame*, supplied by a Bunsen or Tirrill gas burner having a tube 10 mm (0.375 in.) inside diameter centered beneath the lower edge of the clamped specimen and with the top of the tube 19 mm (0.75 in.) beneath it, adjusted with its air supply closed to give a flame 40 mm (1.6 in.) high. The burner is equipped with an extended handle and a track so that it may be slid into position after lighting.

NOTE 1: For general use, either commercial natural gas, or liquefied propane gas is acceptable. If additional precision is required, a synthetic gas mixture¹ of the following composition may be used: 55 ± 1% hydrogen, 24 ± 1% methane, 3 ± 1% ethane, and 18 ± 1% carbon monoxide. The gas should be supplied to the burner at a pressure of 17.2 ± 1.7 kPa (2.0 ± 1/4 psi).

3.4 *Timer*, stopwatch or electric timer.

3.5 *Scale*, graduated in millimeters or 0.1-in. units.

3.6 *Miscellaneous*: beaker, 2000 mL; glass tube, 6.35 mm (0.25 in.) inside diameter, sufficiently long to extend to the bottom of the beaker; wire mesh screen, large enough to cover the top of the beaker and to keep the specimens immersed; paper toweling; metal or glass rod 6 mm (1/4 in.) diameter.

¹Names of suppliers of testing equipment and materials for this method may be found on the Test Equipment Suppliers list, available as part of the CD or printed set of Standards, or on the TAPPI website general Standards page.