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1 SCOPE

- 1.1 This method describes procedures for evaluating the flammability of textile fabrics and is applicable to items 4 (general textile products), 5 (children's sleepwear other than Item 40 of Part II) and 13 (bedding textiles) of Part I and to items 25 (cribs and cradles) and 26 (playpens) of Part II of Schedule I to the Hazardous Products Act (HPA).
- 1.2 This method is provided to facilitate laboratory procedures only. It is the trader's responsibility to ensure that the product is tested according to, and meets the requirements of, the HPA and its Regulations.


2 APPLICABLE DOCUMENTS

- 2.1 ASTM Standard D1230-61: *Standard Test Method for Flammability of Clothing Textiles (Appendix 1)*
- 2.2 CGSB CAN2-4.2 Method No. 30.3-M87: *Procedure for the Removal of Flame-Retardant Treatments from Textile Products (Appendix 2)*¹
- 2.3 Product Safety Reference Manual: *Book 4 - Flammable Products*
- 2.4 Method F-00 of this manual: *General Information for Flammability Test Methods*
- 2.5 Method F-22 of this manual: *Test Methods for Detection of Fire Retardants in Textile Products and Fibres*
- 2.6 Product Safety Laboratory Report #99-0542

3 DEFINITIONS

- 3.1 *Textile fibre*: Any natural or manufactured matter that is capable of being made into a yarn or fabric, including human hair, kapok, feathers and down and animal hair from an animal skin.
- 3.2 *Raised fibre surface*: A napped, pile, tufted, flocked or similar surface.
- 3.3 *Flame Spread Time (FST)*: The time taken by the flame to travel from the point of application to the stop-cord and sever it. This time is automatically recorded on the flammability tester.

¹ This standard is referenced because the washing instructions in ASTM D1230-61 (section A1.3) were improperly typeset. Section A1.3 of ASTM D1230-61 was editorially removed in 1978, but not replaced.

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- 3.4 *Surface Flash (SF)*: Surface fibres are burned. Stop-cord is not severed and no burning, charring or fusion of the base fibres is observed.
- 3.5 *Surface Burn (SB)*: Flaming spreads slower than surface flash (SF) on surface of raised fibres. Stop-cord is severed and a flame spread time is recorded.
- 3.6 *Base Burn (BB)*: Burning of base fibres severs stop-cord and a flame spread time is recorded.
- 3.7 *Surface Burn, Base Burn (SBBB)*: Surface fibres are burned and base fibres are severed. Stop-cord is severed and a flame spread time is recorded.
- 3.8 *Ignited But Extinguished (IBE)*: The flame extinguished before reaching the stop-cord.
- 3.9 *Timed Surface Flash (TSF)*: Surface fibres are burned. Stop-cord is severed but no burning, charring or fusion of the base fibres is observed.
- 3.10 *Surface Flash, Base Burn (SFBB)*: Surface fibres are burned and base fibres are burned. Burning of base fibres severs stop-cord and a flame spread time is recorded.
- 3.11 *Timed Surface Flash, Base Burn (TSFBB)*: Surface fibres are burned, this severs the stop-cord and a flame spread time is recorded. The base fibres burn; however, the time taken for the base burning is not recorded since the stop-cord has previously been severed by the Timed Surface Flash. On the other hand, the base fibres may ignite but extinguish before the entire specimen is consumed.


4 APPARATUS

See ASTM D1230-61 method (Appendix 1), section 4

5 PROCEDURE

- 5.1 Conduct preliminary trials to determine the direction, surface and pattern whereby the fabric burns most rapidly. Test one specimen from each surface of the fabric in both the lengthwise and crosswise directions (i.e. a total of 4 specimens). If a sample has raised fibre surface(s), test one specimen from each surface of the fabric in the following directions: upwards, downwards, leftwards and rightwards (i.e. a total of 6 specimens for a fabric with one raised fibre surface and a total of 8 specimens for a fabric with two raised fibre surfaces).²
- 5.2 Test the sample according to the procedure in ASTM Standard Test Method D1230-61. If dry cleaning and washing are required, follow CGSB method CAN2-4.2 No. 30.3-M80. For light weight fabrics, tape the specimen to the bottom part of the specimen holder to help hold the specimen taut and in place. Specimens from multi-layered garments

² If, based on the unexpected flammability behaviour in preliminary testing, the presence of a flame-retardant treatment is suspected in the sample, use method F-22 to verify. If the presence of such a treatment is confirmed, dry cleaning and washing of the sample is required.

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should include all of the layers held in the same relative position they occupy in the garment.


- 5.3 Refer to the section entitled "Test Procedure" of the Reference Manual, Book 4, Item 4.1.04 (pages 13-14) to determine the number of specimens required to be tested.
- 5.4 Cut three swatches (app. 25 mm x 25 mm) from the sample and mark them with an arrow indicating the direction of test on the side the fabric was tested, and attach the swatches to the report.

6 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

- 6.1 The timing device on the flammability tester should be calibrated in accordance with the manufacturer's recommended procedures.
- 6.2 The desiccant used must be anhydrous. This can be ensured by using a desiccant with an indicator.
- 6.3 The flame length must be measured with the metal gauge provided and adjusted prior to testing.
- 6.4 When washing, the soap concentration and the temperature of the water must be controlled.
- 6.5 The Quality Control section of the test method is under development and will be added in a revised issue when completed.

7 TEST REPORT

- 7.1 The test report shall contain the following information:
 - 7.1.1 The applicable item number of Part I or Part II of the Schedule I to the Hazardous Products Act.
 - 7.1.2 Composition or fibre content from the label, Sample Record (SR) form or from analysis and construction of the fabric.
 - 7.1.3 The direction in which the fabric was tested and the surface (inner or outer) tested.
 - 7.1.4 Whether the test results apply to the fabric as-received or after dry cleaning and washing.

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- 7.1.5 Flame spread time for each specimen tested.
- 7.1.6 Average Flame spread time for the specimens that burned.
- 7.1.7 Ignition or fusing of the base of fabrics having a raised fibre surface.

7.2 The report will be prepared in the format illustrated below:

ASTM D1230-61 Test on As-Received Material [After Dry Cleaning and Washing]

Composition (*from label, SR form or analysis*):

Construction: *knit/woven; specify if raised fibre surface*

Direction of test: *inner/outer surface;*

lengthwise/crosswise if a garment (wales/courses or warp/weft if a loose fabric)


<i>Specimen</i>	<i>FST * (s)</i>	<i>Remarks</i>
1		
2		
3		
4		
5		
<i>Average Flame Spread Time:</i>		<i>s</i>

Remarks and Footnotes as applicable:

* FST: Flame Spread Time; SB: Surface Burn; BB: Base Burn; SBBB: Surface Burn Base Burn; SF: Surface Flush; TSF: Timed Surface Flush; IBE: Ignited But Extinguished

Note: The arrow on the attached sample swatch indicates the surface and direction of test.

7.3 Attach sample swatches to the report.


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8 PRECISION AND BIAS

- 8.1 Precision: The precision of this test method is being determined.
- 8.2 Bias: The true value of the flammability of apparel textiles can only be described in the terms of a test method. Within this limitation, this test method has no known bias.

9 SAMPLING

Generally, a sample is made up of 2 sample elements (garments) but preferably 3. In the case of loose fabrics, a sample should contain a fabric piece that measures at least 0.5 m x 0.5 m.

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APPENDIX 1



Designation: D 1230 - 61
(Reapproved 1972)²

An American National Standard
American Association of Textile
Chemists and Colorists Standard
Method 33 - 1962

Standard Test Method for FLAMMABILITY OF CLOTHING TEXTILES¹

This standard is issued under the fixed designation D 1230; 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.

¹ NOTE—Section 1.2 was added in August 1974.
² NOTE—Section A1.3 was deleted editorially in July 1978.

1. Scope

1.1 This method covers the evaluation of the flammability of clothing textiles. It is applicable to textile clothing and textiles intended to be used in clothing. The term "raised fiber surface" in the method means a napped, pile, tufted, flocked, or similar surface.

1.2 *This standard should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use.*

2. Applicable Documents

2.1 ASTM Standards:

- D 484 Specification for Hydrocarbon Dry-cleaning Solvents²
- D 496 Specification for Chip Soap³

3. Summary of Method

3.1 Specimens cut from the textile are prepared by brushing if they have a raised fiber surface, by dry cleaning and laundering if they have a flame-retarding finish, and by drying. The dried specimen is held in a special apparatus at an angle of 45 deg. a standardized flame is applied to the surface near the lower end for 1 s. and the time required for flaming to proceed up the fabric a distance of 5 in. (127 mm) is recorded. Ignition or fusing of the base of fabrics having a raised fiber surface is noted. Three classes of flammability are recognized.

4. Apparatus and Materials

4.1 *Flammability Tester*,⁴ as shown in Fig. 1, and described in the Appendix.

4.2 *Brushing Device*,⁴ as shown in Fig. 2, and described in the Appendix.

4.3 *Dry Cleaning Cylinder*, as described in the Appendix.

4.4 *Laboratory Drying Oven*.

4.5 *Desiccator*, 250 mm in diameter.

4.6 *Calcium Chloride*, anhydrous.

4.7 *Butane*, cp.⁵

4.8 *Neutral Chip Soap*, conforming to Specification D 496, as follows:

Moisture and matter volatile at 220 F (105 C), max, percent	10.0 ⁶
Sum of free alkali, total matter insoluble in alcohol and sodium chloride, max, percent	4.0
Free alkali, calculated as NaOH, max, percent	0.2
Matter insoluble in water, max, percent	1.0
Titer of the mixed fatty acids prepared from the soap, min	39 C
Anhydrous soap content, min, percent	85.0

⁶ Deliveries which yield more than 10 percent volatile matter shall be rejected without further test.

4.9 *Dry Cleaning Soap*, made by dissolving 56 g of caustic potash (KOH) in 100 ml of water. This solution is poured slowly with constant stirring into a mixture of 340 g of oleic acid, 400 ml of Stoddard solvent (Specification D 484), and 100 ml of tertiary butyl

¹ This method is under the jurisdiction of ASTM Committee D-13 on Textiles, and is the direct responsibility of Subcommittee D13.52 on Flammability.


Current edition effective Sept. 18, 1961. Originally issued 1952. Replaces D 1230 - 52 T.

² *Annual Book of ASTM Standards*, Part 23.

³ *Annual Book of ASTM Standards*, Part 30.

⁴ The Flammability Tester and Brushing Device are obtainable from the U.S. Testing Co., Hoboken, N.J.

⁵ Butane, cp, No. 4 cylinders containing 2 lb may be obtained from, among others, the Matheson Co., Inc., East Rutherford, N.J.

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alcohol or an equal quantity of butyl Cellosolve.

4.10 *Perchloroethylene*.

4.11 *Cotton Sewing Thread*, No. 50, mercerized.

4.12 *Worsted Test Fabric*—Undyed worsted cloth, plain weave, 8 to 8½ oz/linear yd, 58 in. (1437 mm) wide. A fabric suitable for this purpose is “Moth Test Cloth.”⁶

5. Test Specimens

5.1 Five specimens, each measuring 2 by 6 in. (51 by 152 mm) shall be selected for each test.

5.2 To determine the direction in which to cut the specimens and the surface to test, whereby the fabric burns most rapidly, make preliminary trials, in accordance with the prescribed test procedure, with specimens cut in different directions in the fabric or garment.

5.3 For textiles having a raised fiber surface, the long dimension usually is in the direction of the lay of the surface fibers. For textiles with varying depths of pile, tufting, etc., the specimens shall be taken from that part which has the fastest rate of flame spread.

5.4 Specimens from garments may include all of the layers held in the relative position they occupy in the garment.

5.5 If the specimens in the preliminary tests do not ignite, or are very slow burning, or could have a fire-retarding finish, a swatch large enough to provide the number of specimens required for the test, with allowance for shrinkage in dry cleaning and washing, shall be subjected to the dry cleaning and washing procedures.

6. Preparation of Specimens

6.1 *Marking and Cutting Specimens*—Five specimens, each 2 by 6 in. (51 by 152 mm) shall be marked out on the surface opposite that to be tested, with the long dimension in the direction in which burning is most rapid, as established in the preliminary trials (Section 5). The end of each specimen toward which, and on the surface of which, flame spread is most rapid shall be identified by attaching a staple to it. The specimens shall then be cut from the fabric.

6.2 *Brushing and Drying Specimens*—Each

specimen having a raised fiber surface shall be brushed once against the lay of the surface fibers with the brushing device shown in Fig. 2. Other specimens do not require brushing.

6.3 The specimens shall be clamped individually in the specimen holders of the flammability tester (Fig. 1) so that the stapled end will be in the upper position during test, thus insuring that the specimen is mounted in the direction of most rapid burning. The mounted specimens shall then be dried in a horizontal position in an oven for 30 min at 221 F (105 C), removed from the oven, and placed over anhydrous calcium chloride in a desiccator until cool, but for not less than 15 min.

7. Procedure

7.1 Adjust the position of the rack of the flammability tester with a holder and trial specimen (not a prepared specimen) in position, so that the tip of the indicator touches the face of the specimen.


7.2 Open the control valve of the fuel supply and allow approximately 5 min for the air to be driven from the fuel line. Ignite the gas and adjust the flame to a length of ⅝ in. (16 mm) measured from its tip to the opening in the gas nozzle.

7.3 Remove a mounted specimen from the desiccator and place it in position on the rack in the chamber of the apparatus. *The test specimen should be ignited within 45 s of the time it was removed from the desiccator.* String the stop cord (No. 50 cotton sewing thread) through the guides in the upper plate of the specimen holder, across the top of the specimen and through the guides at the rear of the chamber, over the guide ring, and attach the weight to the cord close to and just below the guide ring.

7.4 Close the door of the apparatus. Set the stop watch at zero. Conduct the test in a draft-free room with the apparatus at room temperature.

7.5 Bring the starting level over to the extreme right and release it. This starts the timing mechanism and applies the flame to the specimen for a period of 1 s. Timing is automatic, starting upon application of the flame and ending when the weight is released by the burning of the stop cord.

⁶This cloth may be obtained from Testfabrics, Inc., Plainfield, N.J.

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7.6 Record the time of flame spread for each specimen, and note whether the base of each specimen having a raised fiber surface is ignited or fused to a point where the damage is apparent from the bottom of the specimen.

8. Results

8.1 The time of flame spread of the textile shall be the average time for the five specimens. If this time is less than 3½ s or if some of the specimens do not burn, test five additional specimens. The time of flame spread of the fabric or product shall then be the average time for the ten specimens, or for the number of specimens that burn. The ignition of fusing of the base fabric of textiles having a raised fiber surface is reported when the base fabric of more than one of the five (or two of the ten) specimens ignites or fuses.

9. Suggested Interpretation of Results

9.1 All fabrics made of natural or regenerated cellulose, as well as many made from other natural or synthetic fibers, are combustible. Some combustible fabrics when used for clothing are potentially dangerous to the wearer because of the ease of ignition, rapidity, and intensity of burning, and design of the garment. The first three characteristics can be judged with the aid of the flammability tester.

9.2 In order to place fabrics in one or another of three classes of flammability, arbitrary limits have been selected for time of application of the flame and for rate of flame spread. These limits are based on extensive testing experience and are believed to be a useful guide in judging the relative flammability of clothing textiles. It must be understood, however, that no guarantee can be given and none is implied that a fabric or product falling into any one of the classes will or will not burn with disastrous results under some condition of use. Because of the sensi-

tivity of the fabric rate of burning to ambient atmospheric conditions, technique of specimen preparation, and inherent variability in the cloth itself, test results are not always closely reproducible either in the same laboratory or among several laboratories. It is considered essential that the specified equipment be used and procedures followed very closely in order to eliminate avoidable variations in results.

9.3 The classes are as follows:

9.3.1 **Class 1: Normal Flammability**—These textiles are generally accepted by the trade as having no unusual burning characteristics.

9.3.1.1 Textiles that do not have a raised fiber surface but have a time of flame spread in the test of 3½ s or more.

9.3.1.2 Textiles having a raised fiber surface that have a time of flame spread in the test of more than 7 s or that burn with a surface flash (time of flame spread less than 7 s), provided the intensity of the flame is insufficient to ignite or fuse the base fabric.

9.3.2 **Class 2: Intermediate Flammability**—These textiles are recognized by the trade as having flammability characteristics between normal and intense burning.


9.3.2.1 Textiles having a raised fiber surface that have a time of flame spread in the test of 4 to 7 s, inclusive, and the base fabric is ignited or fused.

9.3.3 **Class 3: Rapid and Intense Burning**—These textiles are considered dangerously flammable and are recognized by the trade as being unsuitable for clothing because of their rapid and intense burning.

9.3.3.1 Textiles that do not have a raised fiber surface that have a time of flame spread in the test of less than 3½ s.

9.3.3.2 Textiles having a raised fiber surface that have a time of flame spread in the test of less than 4 s, and the base fabric is ignited or fused.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, 1916 Race St., Philadelphia, Pa. 19103, which will schedule a further hearing regarding your comments. Failing satisfaction there, you may appeal to the ASTM Board of Directors.

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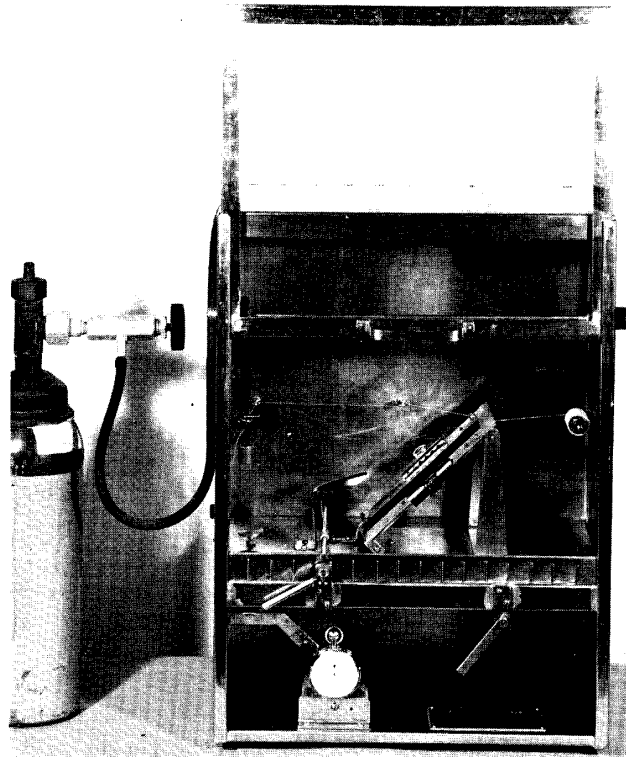


FIG. 1 Flammability Tester.

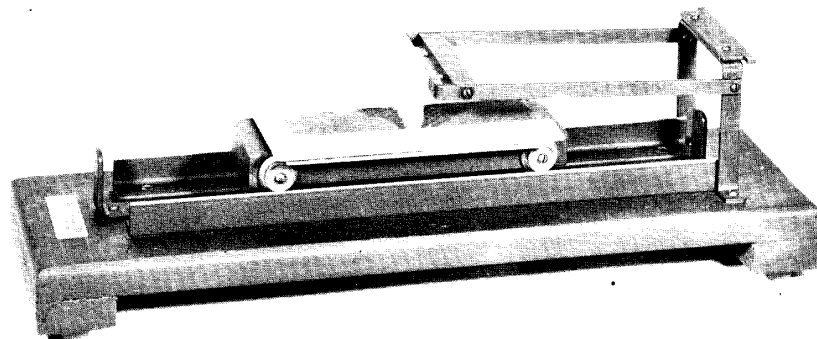



FIG. 2 Brushing Device.

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APPENDIX

A1. DESCRIPTION OF APPARATUS

A1.1 Flammability Tester

A1.1.1 The Flammability Tester (Fig. 1) consists of a draft-proof ventilated chamber enclosing a standardized ignition medium, a specimen rack and an automatic timing device.

A1.1.2 The draft-proof metal chamber prevents air circulation around the specimen rack and flame, but permits free ventilation for rapid oxidation. The chamber is 14½ in. (368 mm) wide by 8½ in. (216 mm) deep by 14 in. (356 mm) high. There are twelve ½-in. (12.7 mm) holes equidistant along the rear of the top closure. A ventilating strip is provided at the base of the sliding glass door in the front of the chamber.

A1.1.3 The specimen rack provides support for the frames in which the specimens are mounted. The angle of inclination is 45 deg. Two guide pins projecting downward from the center of the base of the rack, travel in slots provided in the floor of the chamber so that adjustment can be made for the thickness of the specimen in relation to the flame front. An indicating finger is provided, the fore part of which touches the specimen when the rack is correctly adjusted.

A1.1.4 The specimen holder consists of two ¼-in. (1.6-mm) matched metal plates with clamps mounted along the sides, between which the specimen is fixed. The plates are slotted and loosely pinned for alignment. The two plates of the holder cover all but 1½ in. (38.1 mm) of the width of the specimen for its full length. The specimen holder is supported in the draft-proof chamber on the rack at an angle of 45 deg. Five specimen holders are provided.

A1.1.5 Two control knobs hold the rack in test position. The knobs can be reached under the stage of the cabinet and permit forward and backward movements of the rack when loosened.

A1.1.6 The ignition medium consists of a spring-motor driven gas jet formed around a 26 gage hypodermic needle. A trigger located in the front of the apparatus serves to wind the spring motor when the machine is placed in operation. The gas jet is protected by a copper shield.

A1.1.7 The stop cord is stretched from the spool through suitable thread guides provided on the specimen frame and chamber walls, permitting the lacing of the cord in the proper position exactly 5 in. (127 mm) from the point where the center of the ignition flame impinges on the test specimen. The stop cord is a No. 50 mercerized sewing thread.

A1.1.8 A weight attached by means of a clip to the stop cord, in dropping, actuates the stop mo-

tion.

A1.1.9 The glass door slides in grooves at the front of the cabinet. A knob moves the catch mechanism used to hold the sliding door in an open position for insertion of the test specimen holders.

A1.1.10 A sensitive fuel control valve regulates the fuel supply at the tank. The valve ends in a ½-in. male connection for attachment to the standard No. 4 butane cylinder of 2-lb (0.91-kg) capacity.

A1.1.11 The flow meter consists of a U-shaped glass tube cut into the gas line to register the gas pressure delivered to the microburner. Attached to the case wall behind the flow meter is a movable metal plate with two parallel horizontal lines properly spaced to indicate the desired gas pressure. When the pressure is off, the plate is so regulated that the liquid level in both sides of the U-shaped tube meets the lower line. When the apparatus is in operation the pressure is so adjusted that the higher liquid level in the U-shaped tube meets the upper line.

A1.1.12 The starting lever is operated from left to right in one stroke and is released to operate the gas jet. A driving mechanism on the rear of the cabinet moves the gas jet to its most forward position and automatically starts the stop watch, by means of special attachments, at the moment of flame impact. The weight, when released by severance of the cord, drops onto a platform to stop the watch. Timing is read directly.


A1.2 Brushing Device

A1.2.1 The brushing device (Fig. 2) consists of a base board over which a small carriage is drawn. This carriage runs on parallel tracks attached to the edges of the upper surface of the base board. The brush is hinged with pin hinges at the rear edge of the base board and rests on the carriage vertically with a pressure of 150 g.


A1.2.2 The brush consists of two rows of stiff nylon bristles mounted with the tufts in a staggered position. The bristles are 0.016 in. (0.41 mm) in diameter and ¾ in. (19 mm) in length. There are 20 bristles per tuft and 4 tufts per inch. A clamp is attached to the forward edge of the movable carriage to permit holding the specimen on the carriage during the brushing operation.

A1.2.3 After the specimen has been put in place on the carriage and fastened by means of the clamp, the brush is raised, the carriage pushed to the rear, and the brush lowered to the face of the specimen. The carriage is then drawn forward by hand at a uniform rate.

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APPENDIX 2


National Standard of Canada		Norme nationale du Canada	
 Ottawa Canada K1A 1G6	TEXTILE TEST METHODS MÉTHODES POUR ÉPREUVES TEXTILES	CAN/CGSB-4.2	
	Procedure for the Removal of Flame-Retardant Treatments from Textile Products Mode de suppression des agents ignifuges dans les produits textiles	No./N° 30.3-M87	

Supersedes Issue of
Remplace l'édition de
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<p>1. PURPOSE AND SCOPE</p> <p>1.1 The laundering and dry cleaning procedure described in this method is for removing nonpermanent flame-retardant treatments applied to textile products.</p> <p>1.2 This method is not applicable to textile floor coverings (Note 1).</p> <p>2. PRINCIPLE</p> <p>2.1 Specimens are dry cleaned for 25 min with a solution of perchloroethylene and dry cleaning detergent, rinsed four times with perchloroethylene followed by extraction of the excess solvent and drying at room temperature. Specimens are then immersed in a solution of neutral chip soap, worked gently for 5 min, rinsed, extracted, dried at room temperature and pressed lightly if required.</p> <p>3. APPLICABLE PUBLICATIONS</p> <p>3.1 The following publications are applicable to this method:</p> <p>3.1.1 Canadian General Standards Board (CGSB) CAN/CGSB-4.2 – Textile Test Methods: No. 27.5-M – Flame Resistance – 45° Angle Test One-Second Flame Impingement.</p> <p>3.1.2 ASTM D 496 – Standard Specification for Chip Soap.</p> <p>3.2 Reference to the above publications is to the latest issues, unless otherwise specified by the authority applying this method. Sources for these publications are shown in the Notes section.</p>	<p>OBJET</p> <p>L'opération de blanchissage et de nettoyage à sec décrite dans la présente méthode est destinée à retirer les agents ignifuges, non permanents, appliqués aux produits textiles.</p> <p>La présente méthode ne s'applique pas aux revêtements textiles de sol (remarque 1).</p> <p>PRINCIPE</p> <p>Les spécimens sont nettoyés à sec pendant 25 min avec une solution de perchloréthylène et de détergent pour nettoyage à sec, rincés au perchloréthylène quatre fois après quoi l'excès de solvant est extrait des spécimens avant que ceux-ci ne soient séchés à la température ambiante. Les spécimens sont ensuite immergés dans une solution de savon neutre en paillettes, frottés légèrement pendant 5 min, rincés, sortis, séchés à la température ambiante et, au besoin, légèrement repassés.</p> <p>PUBLICATIONS APPLICABLES</p> <p>Les publications suivantes s'appliquent à la présente méthode:</p> <p>Office des normes générales du Canada (ONGC) CAN/CGSB-4.2 – Méthodes pour épreuves textiles: N° 27.5-M – Résistance à l'inflammabilité sous un angle de 45° – Application de la flamme pendant une seconde.</p> <p>ASTM D 496 – Standard Specification for Chip Soap.</p> <p>Sauf indication contraire de l'autorité appliquant la présente méthode, ces publications s'entendent de l'édition la plus récente. La source de diffusion est indiquée dans la section intitulée Remarques.</p>
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Note 1: A procedure for removing nonpermanent flame-retardant treatments from textile floor coverings is described in CAN/CGSB-4.2 No. 30.2-M.

Remarque 1: Un mode de suppression des agents ignifuges non permanents dans les revêtements textiles de sol est décrit dans CAN/CGSB-4.2 N° 30.2-M.

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4. APPARATUS AND REAGENTS

4.1 **Dry cleaning cylinder** (Note 2): preferably of metal, approximately 300 mm high and 220 mm in diameter (capacity approximately 12 L). The cylinder shall be mounted in a vertical position on an axis which is inclined at an angle of 50° to the axis of the cylinder, and rotated about this axis at a speed of 45 to 50 r/min.

4.2 **Neutral chip soap** (Note 3): conforming to ASTM D 496, as follows:

Moisture and matter volatile at 105°C (max.)	10.0%
Sum of free alkali, total matter insoluble in alcohol and sodium chloride (max.)	4.0%
Free alkali, calculated as NaOH (max.)	0.2%
Matter insoluble in water (max.)	1.0%
Titer of the mixed fatty acids prepared from the soap (min.)	39°C
Anhydrous soap content (min.)	85.0%

4.3 **Dry cleaning detergent**: amine sulfonate type.

4.4 **Tetrachloroethylene** (also known as perchloroethylene): commercial grade, having a Threshold Limiting Value — Time Weighted Average (TLV-TWA) of 50 ppm.

4.5 **Worsted test fabric** (Note 4): undyed worsted wool cloth, plain weave, 210 to 240 g/m². "Moth Test Cloth" has been found satisfactory for this purpose.

5. TEST SPECIMENS

5.1 Specimens shall be cut with their length in the direction of more rapid burning. Either individual specimens 70 x 190 mm or a swatch having an area of at least 1330 cm², a minimum length of 70 mm and a minimum width of 190 mm may be tested (Note 5).

Note 2: A suitable dry cleaning cylinder is available from U.S. Testing Co., Hoboken, NJ, U.S.A. or, in Canada, from Testing Machines International of Canada Ltd., 6 Ronald Drive, Montreal West, Quebec H4X 1M8.

Note 3: Neutral chip soap conforming to ASTM D 496 may be obtained from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709, U.S.A.

Note 4: Worsted test fabric may be obtained from Testfabrics Inc., P.O. Drawer O, 200 Blackford Ave., Middlesex, NJ 08846, U.S.A.

Note 5: This specimen size is recommended when the flame resistance of textile products after laundering and dry cleaning is to be assessed by CAN/CGSB-4.2 No. 27.5-M. If another flammability test method with other requirements is to be used, suitable adjustments will have to be made.

APPAREILLAGE ET RÉACTIFS

Cylindre de nettoyage à sec (remarque 2): de préférence en métal, d'environ 300 mm de hauteur et de 220 mm de diamètre (contenance approximative de 12 L). Le cylindre doit être placé en position verticale sur un axe incliné à un angle de 50° par rapport à l'axe du cylindre, et il doit tourner autour de cet axe à une vitesse comprise entre 45 et 50 r/min.

Savon neutre en paillettes (remarque 3): conforme à D 496 de l'ASTM et aux données suivantes:

Humidité et matières volatiles à 105°C (max.)	10.0%
Somme des alcalis libres, de toutes les matières insolubles dans l'alcool et du chlorure de sodium (max.)	4.0%
Alcalis libres, exprimés en NaOH (max.)	0.2%
Matières insolubles dans l'eau (max.)	1.0%
Point de figeage du mélange d'acides gras préparé à partir du savon (min.)	39°C
Teneur en savon anhydre (min.)	85.0%

Détergent de nettoyage à sec: à l'amine sulfonate.

Tétrachloréthylène (également désigné perchloréthylène): de qualité commerciale, ayant un seuil d'exposition admissible et une moyenne pondérée en fonction du temps (TLV-TWA) de 50 ppm.

Tissu d'essai de laine peignée (remarque 4): tissu de laine peignée non teint, uni, de 210 à 240 g/m². Le tissu d'essai anti-parasite a été jugé satisfaisant pour le présent essai.

SPÉCIMENS D'ESSAI


Les spécimens doivent être taillés de sorte que leur longueur soit dans le sens de propagation la plus rapide de la flamme. On peut se servir d'échantillons individuels de 70 x 190 mm ou d'une pièce échantillon d'au moins 1330 cm² de surface, dont la longueur et la largeur est d'au moins 70 et 190 mm respectivement (remarque 5).

Remarque 2: On peut se procurer un cylindre de nettoyage à sec convenable auprès de la U.S. Testing Co., Hoboken, NJ, U.S.A. ou, au Canada, auprès de la société Machines d'essais International du Canada Ltée, 6, promenade Ronald, Montréal-Ouest, Québec H4X 1M8.

Remarque 3: On peut se procurer du savon neutre en paillettes auprès de l'American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709, U.S.A.

Remarque 4: On peut obtenir le tissu d'essai de laine peignée en s'adressant à Testfabrics Inc., P.O. Drawer O, 200 Blackford Ave., Middlesex, NJ 08846, U.S.A.

Remarque 5: Ce format de spécimen est recommandé lorsque la résistance aux flammes des produits textiles après blanchissage et nettoyage à sec doit être déterminée selon CAN/CGSB-4.2 N° 27.5-M. Lorsque la détermination est effectuée selon une autre méthode et d'autres exigences, les modifications nécessaires doivent être apportées.

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6. PROCEDURE

- 6.1 Prepare the dry cleaning solution by mixing 60 mL of the amine sulfonate detergent and 4 mL of water for each 3.8 L of perchloroethylene solvent required for the dry cleaning machine. The same solution may be used for repeated cleanings until it becomes dirty. The solution should then be replaced.
- 6.2 Fill the cylinder of the dry cleaning apparatus with 2.5 L of the dry cleaning solution, the specimen(s) and sufficient worsted test fabric in pieces approximately 300 x 300 mm to make a total dry cloth load of 500 g.
- 6.3 Close the lid of the cylinder and operate the machine for 25 min with a solvent temperature no higher than 32°C.
- 6.4 Pour out the cleaning solution, replace with an equal amount of fresh perchloroethylene solvent and operate the apparatus for an additional 5 min. Repeat this operation three times.
- 6.5 Take the specimen from the cylinder and remove excess solvent from it by any convenient means, e.g., centrifuging, or squeezing between layers of towelling or absorbent paper. Allow the specimen to dry at room temperature in a well-ventilated area, preferably in a fume hood with the exhaust fan on.
- 6.6 Immerse the specimen in a bath of soft water containing 0.5% by mass of a neutral chip soap at 35 to 38°C. Work gently for 5 min. The mass of the soap solution should be thirty times that of the specimen.
- 6.7 Rinse the specimen twice in water at 27°C, extract the water and allow the specimen to dry at room temperature.
- 6.8 If the specimen is creased, press lightly on one side with a cool iron.

7. NOTES

- 7.1 The publications referred to in par. 3.1.1 may be obtained from the Canadian Government Publishing Centre, Supply and Services Canada, Ottawa, Canada K1A 0S9. Telephone: (819) 997-2560.
- 7.2 The publication referred to in par. 3.1.2 may be obtained from ASTM, 1916 Race Street, Philadelphia, PA 19103, U.S.A.

MODE OPÉRATOIRE

- Préparer la solution de nettoyage à sec en mélangeant 60 mL de détergent à l'amine sulfonate et 4 mL d'eau pour chaque quantité de 3.8 L de solvant au perchloréthylène à utiliser dans la machine de nettoyage à sec. La même solution peut servir à plusieurs nettoyages, mais elle doit être remplacée dès qu'elle est sale.
- Remplir le cylindre de l'appareil de nettoyage à sec de 2.5 L de solution préparée, y ajouter les spécimens et suffisamment de tissu d'essai de laine peignée, découpé en pièces d'environ 300 x 300 mm, pour donner une charge sèche totale de 500 g.
- Fermer le couvercle du cylindre et faire fonctionner l'appareil pendant 25 min en maintenant la température du solvant à 32°C au plus.
- Évacuer la solution de nettoyage, la remplacer par la même quantité de solvant au perchloréthylène frais et faire fonctionner l'appareil pendant 5 min encore. Répéter l'opération trois fois.
- Retirer le spécimen du cylindre et enlever tout excès de solvant qu'il peut contenir, soit par action centrifuge, soit en pressant le spécimen entre des serviettes ou du papier absorbant. Laisser sécher le spécimen à la température ambiante, dans un endroit bien ventilé, de préférence sous une hotte, le ventilateur étant en marche.
- Plonger le spécimen dans un bain d'eau douce contenant 0.5% en masse de savon neutre en paillettes, à une température comprise entre 35 et 38°C. Frotter délicatement pendant 5 min. La masse de la solution savonneuse devrait être trente fois celle du spécimen.
- Rincer deux fois le spécimen dans de l'eau à 27°C, l'essorer et le laisser sécher à la température ambiante.
- Si le spécimen est froissé, le repasser un peu d'un côté avec un fer tiède.

REMARQUES

- Les publications mentionnées à l'al. 3.1.1 sont diffusées par le Centre d'édition du Gouvernement du Canada, Approvisionnement et Services Canada, Ottawa, Canada K1A 0S9. Téléphone: (819) 997-2560.
- La publication mentionnée à l'al. 3.1.2 est diffusée par l'ASTM, 1916 Race Street, Philadelphia, PA 19103, U.S.A.