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1 SCOPE


This method describes a full scale test procedure for determining the combustion resistance of upholstered furniture to smoldering cigarettes.

2 APPLICABLE PUBLICATIONS

- 2.1 Canadian General Standards Board (CGSB) Standard: CAN2-2.4-M77, Method 27.7, 1979; Method of Test for Combustion Resistance of Mattresses - Cigarette Test.
- 2.2 State of California, Technical Information Bulletin 116; Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Upholstered Furniture, 1980.
- 2.3 National Fire Protection Association: NFPA 260B; Cigarette Ignition Resistance of Upholstered Furniture Composites, 1983; NBS/CPSC (PFF 6-76).
- 2.4 British Standard Institution: BS 5852, Part 1, Fire Tests for Furniture; Methods of Test for the Ignitability by Smokers' Materials of Upholstered Composites for Seating, 1979.
- 2.5 Upholstered Furniture Action Council (UFAC):
 - 2.5.1 Fabric Classification Test Method - 1983;
 - 2.5.2 Filling/Padding Component Test Method - 1983;
 - 2.5.3 Barrier Test Method - 1983;
 - 2.5.4 Welt Cord Test Method - 1983;
 - 2.5.5 Decking Materials Test Method - 1983;
 - 2.5.6 Interior Fabric Test Method - 1983.

3 PRINCIPLE

- 3.1 The method involves the exposure of the surfaces of the upholstered furniture sample to lighted cigarettes, as the standard ignition source, in a draft free environment. The sample shall not exhibit any of the following phenomena:
 - a) flaming during the test;
 - b) charring and/or melting on the upholstery fabric extending beyond the 50 mm line at more than 2 cigarette locations; and
 - c) continuing combustion in the sample one hour after the placement of the last cigarette on the sample.

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4 TEST FACILITIES, APPARATUS AND MATERIALS

- 4.1 Test Burn Room - minimum dimensions of 3.0 x 3.0 m and 2.4 m high, and maintained at $21 \pm 3^{\circ}\text{C}$ and 30 - 65% relative humidity (R.H.). The air velocity in the vicinity of the test sample during the test shall not exceed 0.25 m/s.
- 4.2 Test Cigarette - without filter and made from natural tobacco, 85 ± 2 mm long with a tobacco packing density of 270 ± 20 kg/m³ and a total mass of 1.1 ± 0.1 g at $20 \pm 2^{\circ}\text{C}$ and $65 \pm 2\%$ R.H. The cigarette, when conditioned at $21 \pm 3^{\circ}$ and 35 - 50% R.H. and ignited at one end, shall burn its entire length in 1500 ± 100 s when placed horizontally on the surface of a piece of bonded glass fibre fabric (55 g/m²) (NOTE 1).
- 4.3 A template to draw a line around the cigarette such that any given point on this line is 50 mm distant from the closest point of the cigarette (Figure 1).
- 4.4 A ruler graduated in millimeters for measuring extent of charring or melting.
- 4.5 A time measuring device.
- 4.6 Fire Extinguishers - Adequate means of extinguishing the test samples should be provided.

5 TEST SAMPLE

- 5.1 Test sample is an item of upholstered furniture.


6 SAMPLE CONDITIONING

- 6.1 Furniture and cigarettes shall be conditioned for not less than 24 hours at $21 \pm 3^{\circ}\text{C}$ and $50 \pm 5\%$ R.H. immediately before testing.

7 TEST REQUIREMENTS

- 7.1 Tests are carried out in the test burn room described in subsection 4.1.
- 7.2 Cigarettes, well lighted but not burned more than 4 mm, are placed directly at each test location. These locations include surfaces and crevices of seat, decking, armrests, top of back, and bolsters.
- 7.3 Identify each test location where a cigarette is to be placed and draw a line around it using the template referred in subsection 4.3.
- 7.4 No two cigarettes shall be placed less than 150 mm apart.

Note 1: The Mark Ten King Size cigarette conforms to these specifications.

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7.5 Straight pins may be used to support test cigarettes at the edges, if necessary.

8 TESTING PROCEDURES

8.1 For Seat

- 8.1.1 A schematic diagram for cigarette locations is shown in Figure 2. This format is a basic guideline and specific samples may require certain changes in test locations due to their special structural configuration, e.g. sofas or chairs without upholstered armrests.
- 8.1.2 Cushion-Centre Locations - For quilted or tufted cushions, cigarettes shall be placed directly over thread of the quilt or in the depression caused by the tufts in a manner which will allow the butt ends to burn out on the thread or over the buttons or laces used in the tufts. For smooth surface cushions, the test cigarettes shall be placed in central locations of the cushion.
- 8.1.3 Crevice Locations - Cigarettes shall be placed in crevices of the seat cushion surface and vertical panels (back and armrests) so that their entire length burns out against the cushion surface and vertical panels. If the seat cushion is constructed with a welt, the cigarettes shall be placed along the welt so that their entire length burns out against the welt and vertical panels.
- 8.1.4 Cushion-Front Locations - Cigarettes shall be placed parallel to the welt in the depression created by the cushion surface and the welt. If there is no welt on the cushion, the cigarettes shall be positioned horizontally along the edge or seam on the cushion front.
- 8.1.5 If the sample has two or more seat cushions, two cigarettes shall be burned in each crevice formed by two adjacent seat cushions or welt.
- 8.1.6 Observe for :
- a) flaming during the test;
 - b) charring and/or melting extending beyond the 50 mm line at more than 2 cigarette locations; and
 - c) continuing combustion in the sample one hour after the placement of the last cigarette on the sample.
- 8.1.7 Terminate subsequent testing if a), b) or c) in subsection 8.1.6 occurs.
- 8.1.8 If the sample has loose seat cushion(s), procedures in subsections 8.1.1 - 8.1.7, inclusive, shall be repeated on the other side of the cushion(s).

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8.2 For Decking

8.2.1 A schematic diagram of cigarette locations is shown in Figure 3.

8.2.2 Decking-Centre Locations - For quilted or tufted decking, cigarettes shall be placed directly over thread of the quilt or in the tuft depression in a manner which will allow the butt ends to burn out on the thread or over the buttons. For a smooth decking, the cigarettes shall be placed in central locations of the decking.

8.2.3 Crevice Locations - Cigarettes shall be placed horizontally in the crevice so that their entire length burns out against the decking and the vertical panel surfaces.

8.2.4 Follow procedures in subsections 8.1.6 and 8.1.7.

8.3 For Armrests and Top of Back

8.3.1 If the armrests and/or top of the back are constructed without a welt or seams, the test cigarettes shall be placed horizontally on the armrests and top of the back parallel to the armrests or back panel as shown in Fig. 4(a).

8.3.2 If the armrests and/or top of the back are constructed with a welt, the cigarettes shall be positioned so that their entire length burns out against the welt and a top surface of the armrest or the back. As shown in Figure 4(b), one test cigarette shall be placed at the inner and another at the outer welt edge of both armrests and top of the back, and one each at front edges of the armrests.

8.3.3 If the armrests and/or top of the back are constructed with seams, the cigarettes shall be placed on the seam lines as illustrated in Figure 4(b).

8.3.4 Follow procedures in subsections 8.1.6 and 8.1.7.


8.4 For Bolsters

8.4.1 If the sample has bolsters, each bolster shall be tested separately by placing two cigarettes horizontally on each surface. For the welted bolsters, two cigarettes shall be placed horizontally in the depressions created by the bolster cover surfaces and the welt so that their entire length burns out against the welt cord and the cover surfaces.

8.4.2 Follow procedures in subsections 8.1.6 and 8.1.7.


9 REPORT

Report the following:

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- 9.1 Identification and construction of the test samples.
- 9.2 Cigarette locations (Schematic diagrams may be used).
- 9.3 Locations at which charring and/or melting extends beyond the 50 mm line.
- 9.4 If flaming combustion occurs.
- 9.5 If smoldering combustion continues one hour after the placement of the last cigarette on the furniture sample.

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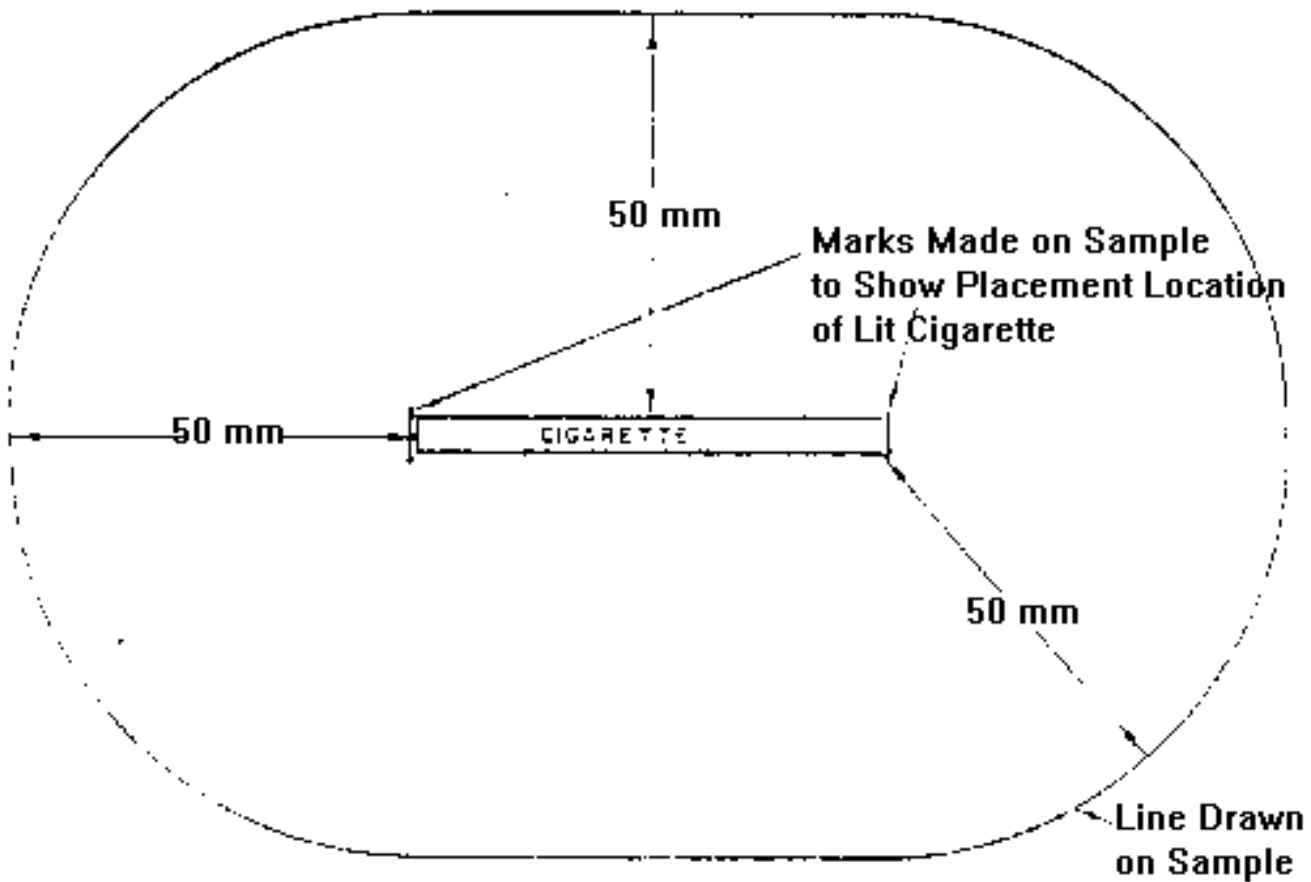



Figure 1. The Template used for marking a Distance of 50 mm around the Test Cigarette.

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Figure 2. Test Cigarette Locations on Seat and Crevices

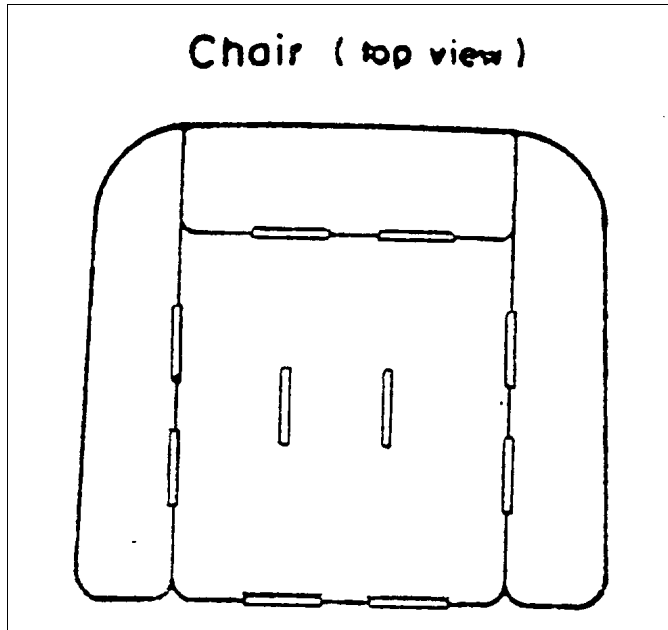
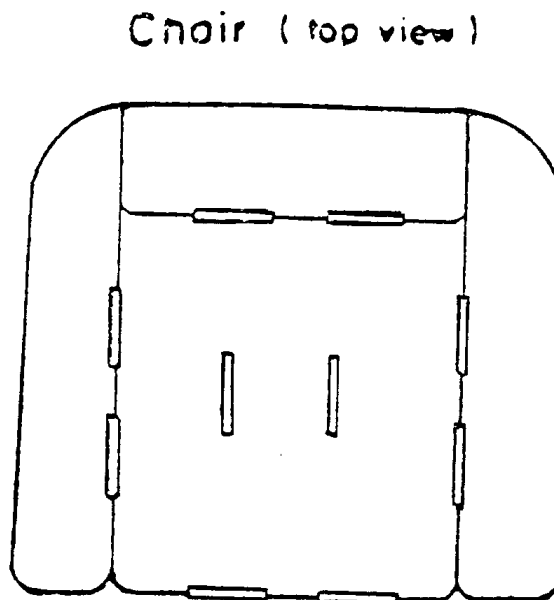



Figure 3. Test Cigarette Locations on Decking and Crevices



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Figure 4a. Test Cigarette Locations on Armrest and Top of Back

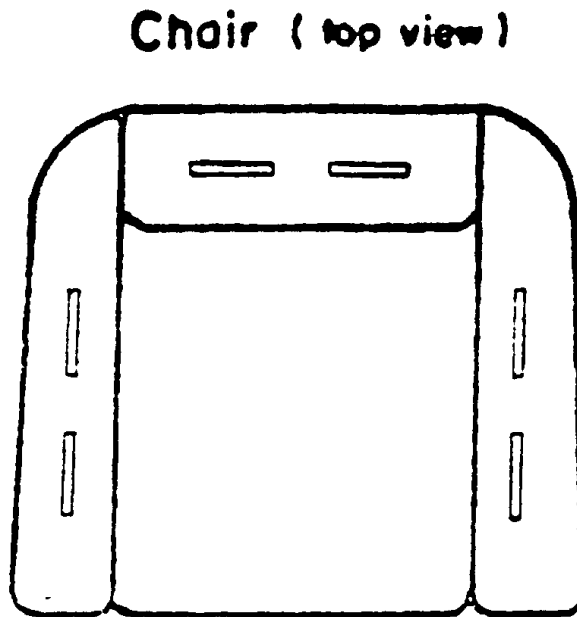


Figure 4b. Test Cigarette Locations on Welted Armrest and Top of Back

