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Series 4
Série des 4

WITHDRAWAL

January 2019

Selected standards in the series Textiles

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CAN/CGSB-4.2

Textile test methods

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No. 27.7-2013

Combustion resistance of mattresses — Cigarette test (ICS 59.080.30)

No. 48-2013 (ISO 137:1975, MOD)

Wool — Determination of fibre diameter — Projection microscope method (ICS 59.060.10)

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No. 27.7-M89

Textile test methods

Combustion resistance of mattresses —

Cigarette test

ICS 59.080.30



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Textile test methods Combustion resistance of mattresses — Cigarette test

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Withdrawn

Textile test methods

Combustion resistance of mattresses – Cigarette test

1 Scope

This method assesses the combustion resistance of mattresses when in contact with a lighted cigarette.

This method covers the resistance of mattresses to ignition only by a burning cigarette and does not relate to their resistance to any other source of ignition or fire condition.

The testing and evaluation of a product against this standard may require the use of materials and/or equipment that could be hazardous. This standard does not purport to address all the safety aspects associated with its use. Anyone using this standard has the responsibility to consult the appropriate authorities and to establish appropriate health and safety practices in conjunction with any applicable regulatory requirements prior to its use. CGSB neither assumes nor accepts any responsibility for any injury or damage that may occur during or as the result of tests, wherever performed.

2 Principle

The surface of a mattress assembly is exposed to a lighted cigarette as the standard ignition source in a draft-protected environment. Individual specimens are assessed by observing the maximum distance of charring or melting on the specimen surface in any horizontal direction from the nearest point of the original location of the cigarette and by determining whether combustion continues in the mattress covering and within each mattress assembly after the cigarette is extinguished.

3 Terms and definitions

For the purposes of this method, the following terms and definitions apply:

3.1

core

the main support system such as springs, foam or fluid that may be present in a mattress.

3.2

mattress

a ticking filled with a resilient material used alone or in combination with other products, intended or promoted for sleeping upon (excluding sleeping bags).

3.3

ticking

the outermost layer of fabric or related material that encloses the upholstery and core.

3.4

upholstery

all material, either loose or attached, between the ticking or between the ticking and the core of the mattress.

4 Apparatus and materials

4.1 Flammability tester (see Figures 1 and 2): the test device comprises an uncovered flame-resistant box approximately 300 x 300 x 300 mm. Within the box, a platform (approximately 295 x 295 mm) is mounted on a scissor jack. The test specimen, which is mounted on this platform, can be clamped into position by raising the jack and compressing the edges against a clamping surround. The firmness of the specimen can be varied by adjusting the height of the platform. The box cover shown in Figures 1 and 2 is used to extinguish the fire in the box.

4.2 Firmness tester (durometer): the purpose of this instrument is to measure the firmness of the mattress assembly under test. Measurement is achieved by local depression of the specimen with a spring loaded probe, reaction to the spring loading being displayed on a dial gauge. The durometer¹ should measure force up to 142 gf and have an accuracy of ± 2.8 gf, and should have a flat circular probe tip measuring 1 cm².

4.3 Cigarette²: the cigarette shall be without filter tip and made from natural tobacco, 85 ± 2 mm long with a tobacco packing density of 270 ± 20 kg/m³, and a mass of 1.1 ± 0.1 g at $65 \pm 2\%$ relative humidity (RH) and a temperature of $20 \pm 2^\circ\text{C}$. The cigarette, when conditioned at $21 \pm 3^\circ\text{C}$ and 35 to 50% RH and ignited at one end, shall burn its entire length in 1500 ± 150 s when placed horizontally on the surface of a glass fibre fabric³ (205 ± 5 g/m²).

4.4 Polyurethane foam⁴: $300 \pm 5 \times 300 \pm 5 \times 25 \pm 5$ mm with a density of 16 to 42 kg/m³ and a firmness of 21 to 61 on the prescribed durometer¹.

4.5 Rule: graduated in millimetres to measure specimen thickness.

4.6 Template: as shown in Figure 3.

4.7 Fire extinguisher: should be immediately available at all times at the test location.

5 Test specimens

5.1 Test specimens shall be $300 \pm 5 \times 300 \pm 5$ mm. In the case of a quilted ticking or a deep panel scroll ticking, the specimens shall be cut so the stitch line is as close as possible to the centre of the mattress assembly. Unless otherwise specified, ten specimens shall be tested.

5.2 Test specimens shall exclude any spring or fluid assembly and shall include

- a) the entire mattress assembly, where its thickness does not exceed 50 mm, or, notwithstanding 5.2 c) and 5.2 d), where it can be reasonably accommodated in the flammability tester;
- b) all of the ticking and upholstery, where the thickness of such ticking and upholstery does not exceed 50 mm, measured in an unrestrained condition;
- c) the outermost 50 mm of ticking and upholstery measured in an unrestrained condition, where the thickness of such ticking and upholstery is greater than 50 mm; or

¹ A durometer that conforms to these requirements is the Model 302SL available from ITM Instruments Inc., 20800 Industriel Boulevard, Ste-Anne-de-Bellevue, Quebec H9X 0A1, telephone 514-457-7280 or Pacific Transducer Corp. (PTC) Instruments, 2301 Federal Avenue, Los Angeles, California 90064-1482 U.S.A., telephone 877-782-2329.

² A cigarette that conforms to these specifications is the Standard Reference Material (SRM) 1196 Standard Cigarette for Ignition Resistance Testing available from the National Institute of Standards and Technology (NIST), 100 Bureau Drive, Stop 2300, Gaithersburg, Maryland 20899-2300 U.S.A., telephone 301-975-2200.

³ Glass fibre fabric that conforms to these requirements is Style #978 (60 inches wide) available from Testfabrics, Inc., 415 Delaware Avenue, PO Box #26, West Pittston, Pennsylvania 18643 U.S.A., telephone 570-603-0432.

⁴ Polyurethane foam that conforms to these requirements is available from Foamite, 1000 Edgeley Boulevard, Vaughan, Ontario L4K 4V4, telephone 888-362-6483.

- d) the outermost 50 mm of ticking and plastic, natural or synthetic rubber measured in an unrestrained condition, where the mattress is a plastic, natural or synthetic rubber assembly exceeding 50 mm in thickness.

6 Conditioning

6.1 Specimens shall be conditioned at 35 to 50% RH and a temperature of $21 \pm 3^{\circ}\text{C}$ for at least 24 h immediately prior to testing.

6.2 Cigarettes used as the ignition source shall be conditioned under the same conditions as in 6.1 after removal from the package.

7 Procedure

7.1 The flammability tester should be placed in an area providing both draft-protected conditions during the test and effective ventilation after the test. Testing should be conducted under atmospheric conditions of 35 to 50% RH and a temperature of $21 \pm 3^{\circ}\text{C}$.

7.2 Remove the front panel of the flammability tester and place the test specimen on the platform.

7.3 Calibrate the durometer in accordance with the manufacturer's instructions.

7.4 Place the durometer on a level section of the mattress, never on a stitch line, and as close to the centre of the specimen as possible.

7.5 Turn the jack handle clockwise until the prescribed durometer¹ registers a firmness reading of 75. If this figure cannot be met, a layer of polyurethane foam described in 4.4 should be mounted immediately beneath the specimen assembly and become part of it. For some samples, two layers of polyurethane foam may be required to achieve the necessary firmness. Turn the jack handle clockwise until the durometer registers a reading of 75. If this figure is exceeded by the relaxed test specimen, the test shall be carried out without applying any tension to the specimen.

7.6 Place an unlit cigarette on the mattress assembly surface in a central position. In the case of a quilted ticking or a deep panel scroll ticking, the cigarette should be placed with as much of the length of the cigarette as possible in a stitch line. This stitch line should be as close as possible to the centre of the mattress assembly.

7.7 Draw a line around the cigarette such that any given point on the line is at a distance of 50 mm from the closest point of the cigarette. A template as shown in Figure 3 may be used to facilitate this procedure.

7.8 After ensuring still-air conditions, remove the cigarette. Mark each conditioned cigarette at a distance of 80 mm from one end. Ignite the cigarette. Once the burning reaches the mark, replace it on the test specimen exactly in its former position.

7.9 Terminate the test either a) when combustion of the ticking exceeds a distance of 50 mm in any horizontal direction from the cigarette location (i.e., crosses the line) or b) 10 min after the cigarette has extinguished.

7.10 Determine whether charring or melting on the specimen surface extends to the line drawn 50 mm from the original location of the cigarette.

7.11 If charring or melting on the specimen surface does not extend beyond the 50 mm line, examine all layers of the specimen for the presence of continuing combustion 10 min after the cigarette has extinguished.

7.12 Ventilate the test area.

8 Report

Report the following information:

- 8.1** Whether charring or melting on the specimen surface extends to 50 mm in any horizontal direction from the original location of the cigarette.
- 8.2** Whether any combustion continues in the mattress assembly 10 min after the cigarette has extinguished.
- 8.3** If the cigarette extinguished before burning its entire length.
- 8.4** The reading of the durometer.
- 8.5** The number of this method: CAN/CGSB-4.2 No. 27.7-2013.

Withdrawn

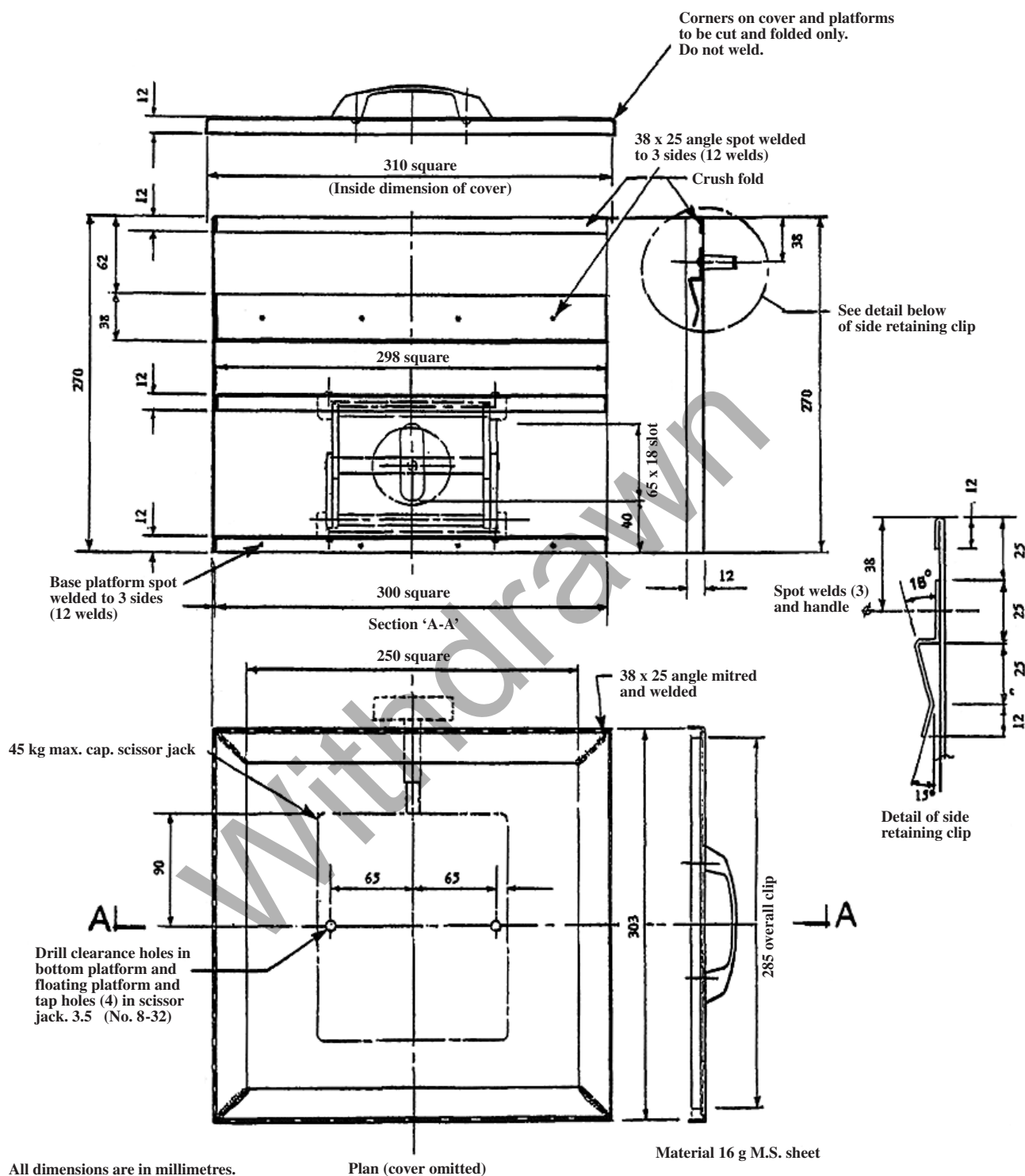


Figure 1 — General arrangement of mattress fire testing box

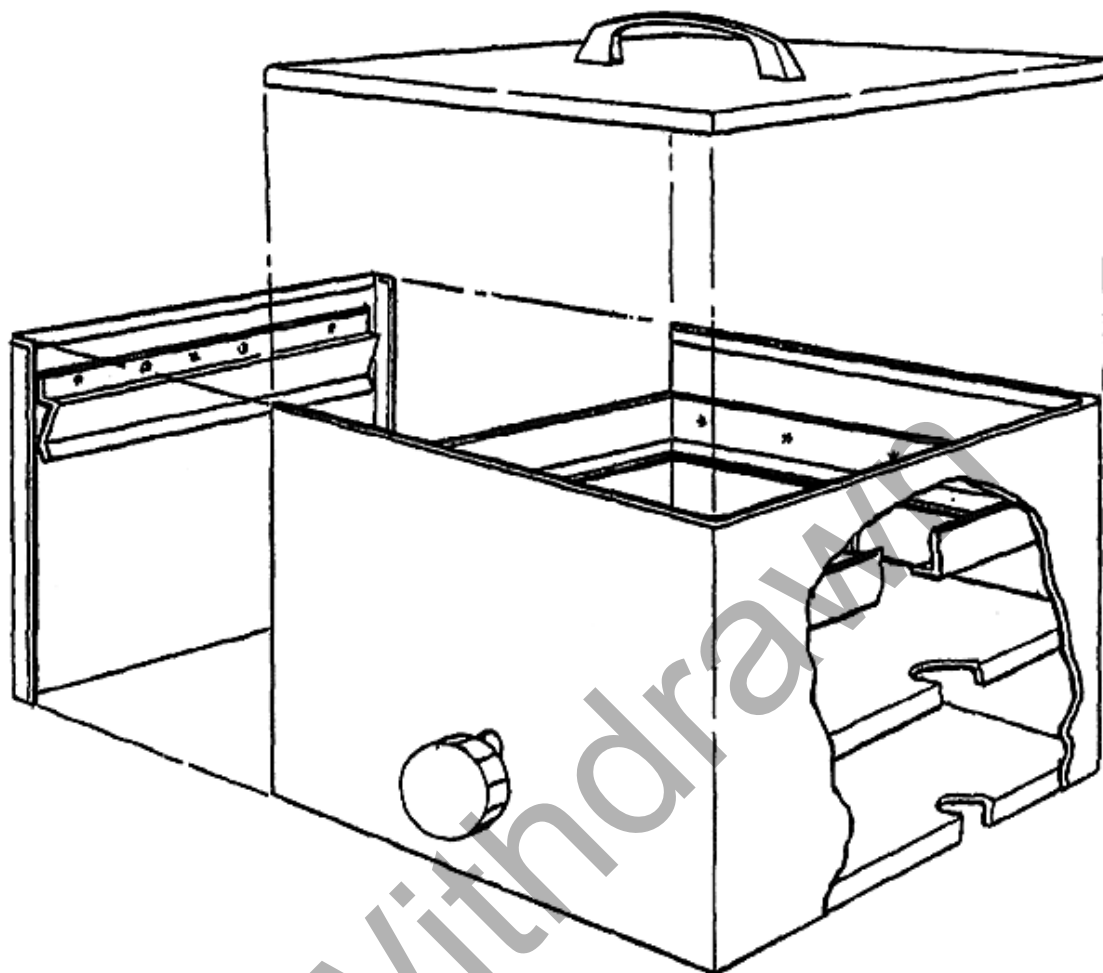


Figure 2 — Pictorial view of mattress fire testing box

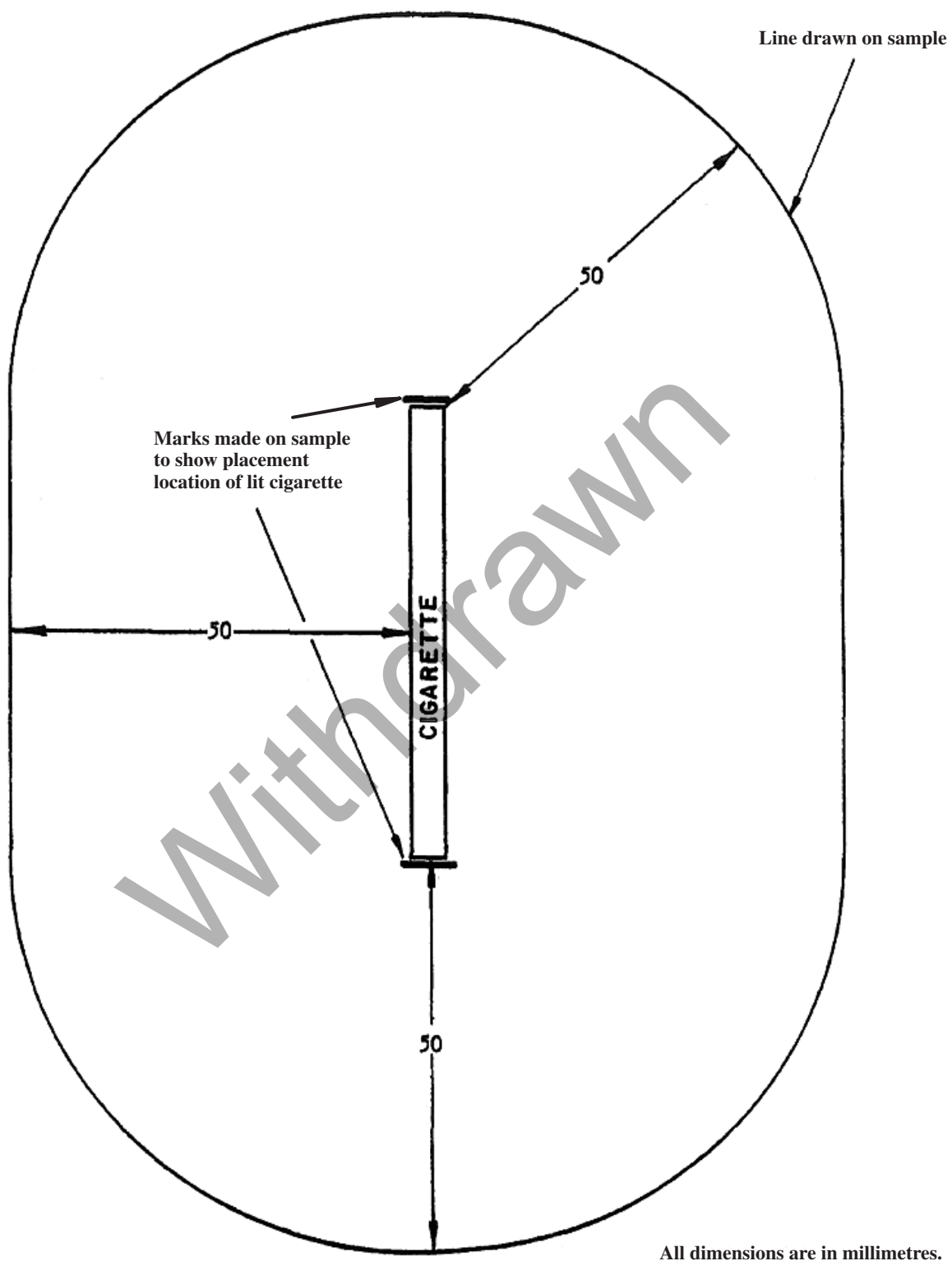


Figure 3 — Template