

STANDARDS AUSTRALIA

RECONFIRMATION
OF
AS 2755.1—1985
Textile fabrics—Burning behaviour
Part 1: Determination of ease of ignition of vertically oriented specimens

RECONFIRMATION NOTICE

Technical Committee CS-086 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 4 June 2013.

The following are represented on Technical Committee CS-086:

Australian and New Zealand Burn Association
Australian Competition and Consumer Commission
Australian Compliance Institute
Australian Industry Group
Australian Retailers Association
AWTA Textile Testing
Consumers Federation of Australia
Council of Textile and Fashion Industries of Australia
CSIRO Manufacturing & Materials Technology
Kidsafe
Ministry of Consumer Affairs (New Zealand)
National Retailers Association
NSW Office of Fair Trading
Retail and Wholesale Merchants Association of New Zealand
RMIT University
Royal New Zealand Plunket Society

NOTES

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

TEXTILE FABRICS—BURNING BEHAVIOUR

AS 2755.1
DETERMINATION OF EASE OF IGNITION OF
VERTICALLY ORIENTED SPECIMENS

1 SCOPE AND APPLICATION. This standard sets out a method for the measurement of ease of ignition of vertically oriented textile fabrics intended for apparel, curtains and draperies in the form of single or multi-component (coated, quilted, multi-layered, sandwich construction and similar combinations) fabrics.

NOTE: This standard takes into account the development of ISO 6940 and is technically identical with that standard. The Explanatory Report of the development of ISO 6940 is given in the annex to this standard.

2 REFERENCED DOCUMENT. The following standard is referred to in this standard:

AS 2001.1 Methods of Test for Textiles—Conditioning Procedures

3 DEFINITION. For the purpose of this standard, the following definition applies:

Minimum ignition time—minimum time of exposure of a material to an ignition source to obtain sustained combustion under specified test conditions.

4 PRINCIPLE. A defined ignition flame from a specified burner is applied to textile specimens which are vertically oriented. The time necessary to achieve ignition is determined as the mean of the measured times for ignition of the fabric.

NOTE: Attention is drawn to Appendix C regarding quality of experimental techniques.

5 HEALTH AND SAFETY OF TEST OPERATORS. Burning of textiles may produce smoke and toxic gases which can affect the health of operators. The testing area should be cleared of smoke and fumes by suitable means.

6 APPARATUS AND MATERIALS.

6.1 Construction of Testing Equipment. Some products of combustion are corrosive. The equipment should be constructed of material which will not be adversely affected by the fumes.

6.2 Location of Test. A location in which the air movement is less than 0.2 m/s at the commencement of the test and is not further influenced by mechanical devices operating during the test. The volume of air surrounding the test location shall be such that the test is not affected by any reduction of oxygen concentration. Where an open fronted cabinet is used for the test, provision shall be made to permit the specimen to be mounted at least 300 mm from any wall.

6.3 Templates. Flat rigid templates made of suitable material and of a size corresponding to the size of the specimens shall be used. Holes approximately 2 mm diameter are drilled in each corner of the template and positioned so that the distances between the centres of the holes correspond to the distances between the pins on the frame (see Fig. 1). The holes shall be located equidistant about the vertical centre-lines of the template (see Note to Clause 7.2).

6.4 Specimen Holder.

6.4.1 Two specimen holders, each consisting of a metal frame on which is mounted 4 pins to support the test specimen (see Fig. 1) shall be used. One specimen holder (No. 1) is for specimens 80 mm × 80 mm, the other specimen holder (No. 2) is for specimens 80 mm × 200 mm. The pins for supporting the specimen have a maximum diameter of 2 mm and a minimum length of 27 mm for locating the specimen in a plane at least 20 mm away from the frame.

NOTE: To locate the specimen in a plane away from the frame, spacer stubs of 2 mm diameter may be provided adjacent to the pins.

6.4.2 If provision is made for testing of multiple specimens on the one specimen holder, the location of the pins shall be such that a space of 10 mm is provided between adjacent mounted specimens.

6.5 Gas Burner. A gas burner as described in Appendix A.

NOTE: Small differences in the design and dimensions of the burner can influence the configuration of the burner flame and so affect the results of the tests.

6.6 Gas. Commercial grade propane or butane gas.

6.7 Timing Device. A timing device to control and measure the application time of the flame accurate to 0.2 s or better shall be used. The device shall have provision for setting time intervals of 1.0 s or less.

7 TEST SPECIMENS.

7.1 Size. The size of each specimen shall be the following dimensions (see Clause 8.6):

- (a) For Frame 1: 80 mm × 80 mm, tolerance +5, −0 mm
(Fig. 1, dimension X = 70).
- (b) For Frame 2: 200 mm × 80 mm, tolerance +5, −0 mm
(Fig. 1, dimension X = 190).

7.2 Pin Location Marks. Place the template (see Clause 6.3) for the appropriate specimen size centrally

on top of the specimen and, by using the holes in the template, mark the position through which the pins must pass.

NOTE: Where the fabric is of open construction (e.g. scrim, gauze), small pieces of adhesive tape may be affixed to the fabric at the pin sites and the pin positions marked on the tape.

7.3 Number. A sufficient number of specimens shall be tested until at least five cases of ignition and five cases of non-ignition occur for each of the length direction and width direction on the size of frame used for the fabric under test (see Clause 8.8). For surface ignition, where the two surfaces of the specimen are dissimilar or preliminary examination indicates it (see Appendix C), each face of the sample shall be tested in this manner (see Clauses 8.8 and 8.9).

7.4 Conditioning of Test Specimens. Condition test specimens in the standard temperate atmosphere of $20 \pm 2^\circ\text{C}$ and 65 ± 2 percent r.h. in accordance with AS 2001.1.

8 PROCEDURE.

8.1 Carry out the test in an atmosphere having a temperature between 10°C and 30°C and a relative humidity between 15 percent and 80 percent.

8.2 Light the burner and preheat it for 2 min. Adjust the flame height to 40 ± 2 mm measured as the distance between the top of the burner tube and the tip of the yellow part of the flame when the burner is vertically oriented and the flame is viewed in dim light.

8.3 Begin testing each specimen within 2 min of removing it from the conditioning atmosphere. If testing is not being performed immediately, place the specimens in sealed containers until testing begins.

8.4 Place the specimen on the pins of the test frame making certain that the pins pass through the points marked off from the template and that the specimen is at least 20 mm removed from the frame. Fit the frame on the support so that the specimen is vertical. (See Note to Clause 7.2.)

8.5 For all fabrics, position the burner as described in Clause 8.5.1. Where a fabric intended for curtains and drapes fails to ignite in the position of the burner described in Clause 8.5.1, the fabric may be ignited by the method described in Clause 8.5.2.

8.5.1 Surface ignition. Position the burner perpendicular to the surface of the specimen such that the axis of the burner is 20 mm above the line of the lower pins in line with the vertical centreline of the face of the specimen (see Fig. 2a). The end of the burner is 17 mm from the face of the specimen.

8.5.2 Edge ignition. Position the burner in front of and below the specimen such that it lies in a plane passing through the vertical centreline of the specimen and perpendicular to its face (see Fig. 2b), such that the longitudinal axis is inclined upwards at 30 degrees to the vertical towards the lower edge of the specimen. The distance between the tip of the burner and the lower edge of the specimen is 20 mm.

NOTE: The edge of the specimen should bisect the flame.

8.6 Apply the flame to the 80 mm $\times$ 80 mm specimen on frame No. 1 for a time period which preliminary testing indicates will approximate the minimum ignition time. Ignition shall be deemed to have occurred if either the flame on the specimen persists for a period of at least 5 s after removal of

the igniting flame, or the specimen burns to the top or to the vertical edges, after removal of the igniting flame.

8.7 If the specimen burns to the top edge during application of the igniting flame, retest the sample using a 200 mm $\times$ 80 mm specimen on frame No. 2.

NOTE: Care should be taken to observe the burning behaviour of textiles which have been given flame retardant treatments or which melt. It may be necessary to commence testing such textiles from 1 s flame application time.

8.8 Record the timer setting and whether the test specimen ignites. Extinguish any flame on the specimen if ignition has occurred then reduce the timer setting by 1 s. If ignition has not occurred, increase the timer setting by 1 s up to a maximum time of 20 s, or as indicated in the applicable product standard. Repeat each trial on a new specimen and continue testing until there are at least five cases of ignition and five cases of non-ignition (failure to ignite). If the specimen ignites at 1 s, record the subsequent non-ignition as '0' s and then retest at 1 s. If a fabric does not ignite within 20 s, five specimens from each direction and each face, where appropriate, shall be tested at 20 s.

8.9 If necessary repeat the surface ignition test on the second surface of the fabric.

9 EXPRESSION OF RESULTS.

9.1 Method of calculation (see Appendix B).

9.1.1 Calculate the mean of the recorded times at which ignition or non-ignition, whichever has occurred least, was observed for each direction (and each surface tested in the case of surface ignition).

9.1.2 If the data used in Clause 9.1.1 relate to ignition, subtract 0.5 from the mean value calculated in Clause 9.1.1. If the data used in Clause 9.1.1 relate to non-ignition, add 0.5 to the mean value calculated in Clause 9.1.1.

9.1.3 Round the resulting value to the nearest second. Report as the mean ignition time for the fabric in the direction tested. In the case of surface ignition, also report the mean ignition time for that surface of the textile in the direction tested.

9.2 Precision.

9.2.1 The precision of this method is being established.

10 TEST REPORT. The test report shall include the following particulars:

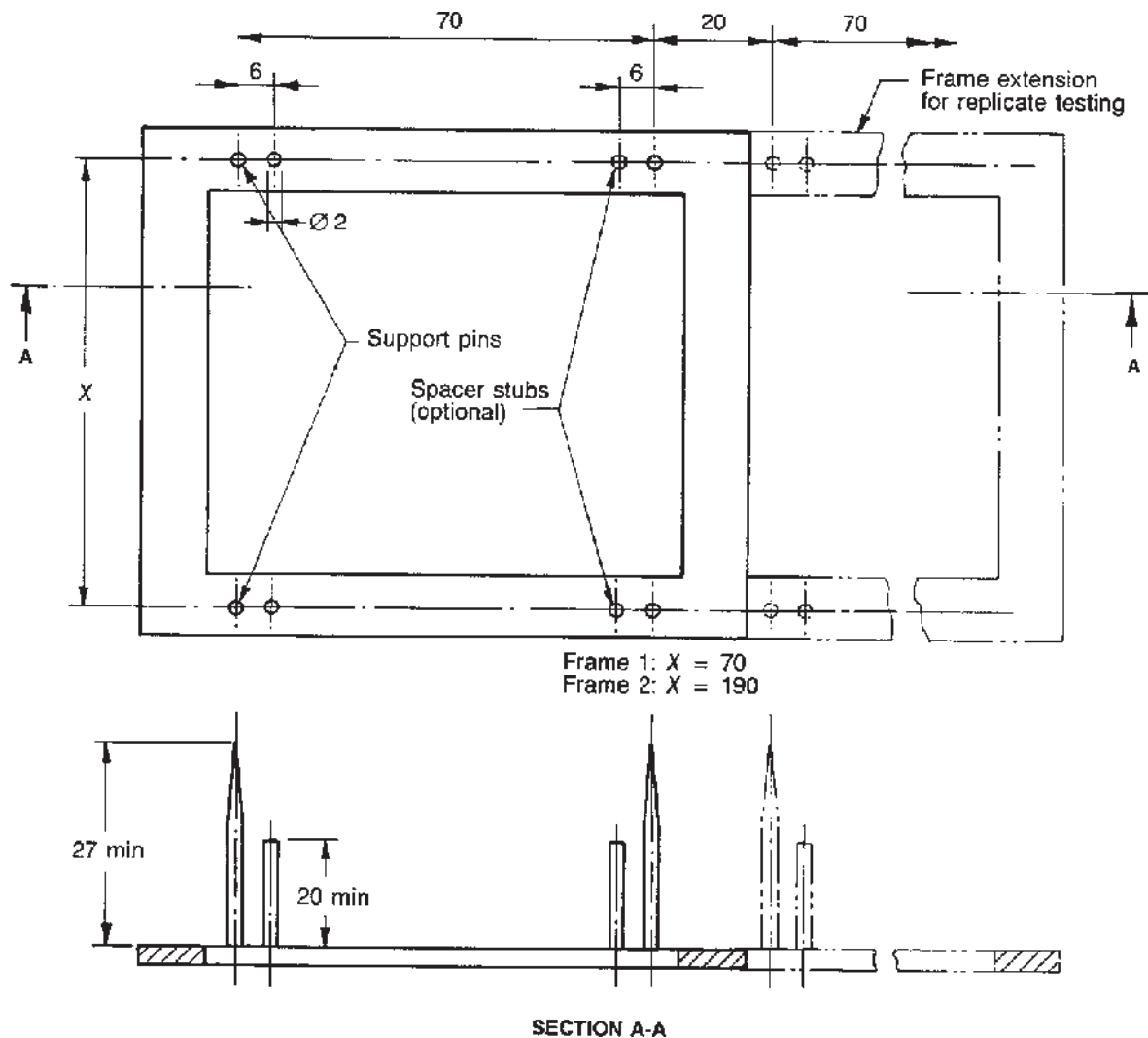
- (a) A statement that the test was carried out in accordance with this standard and details of alterations to it, if any.
- (b) Date of test.
- (c) Ambient conditions of temperature, relative humidity and barometric pressure in the area in which the test is carried out.
- (d) Technique used to attach fabrics which cannot be supported on the pins.
- (e) Gas used to ignite the test specimens.
- (f) Identification of the fabric tested.
- (g) Size of specimen used (see Clause 7.1).
- (h) Orientation of the burner for igniting the test specimens (see Clause 8.5).
- (j) If the fabric did not ignite in 20 s.
- (k) A tabulation for each direction in the case of edge ignition or each surface and direction in the case

of surface ignition (see Clause 7.3), of the number of cases of ignition and non-ignition observed at each timer setting used during the test (see Appendix B, Tables B1 and B2).

- (l) Mean ignition time for each direction or, in the case of surface ignition, for each direction and

surface of the fabric (or fabric construction) tested (see Clause 9.1).

- (m) Minimum ignition time of the textile material as the lowest of the mean ignition times for each specimen.



DIMENSIONS IN MILLIMETRES

Fig. 1. SPECIMEN HOLDER