
**Textile fabrics — Burning behaviour —
Measurement of flame spread properties
of vertically oriented specimens**

*Textiles — Comportement au feu — Détermination des propriétés de
propagation de flamme d'éprouvettes orientées verticalement*

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 6941 was prepared by Technical Committee ISO/TC 38, *Textiles*, Subcommittee SC 19, *Burning behaviour of textiles and textile products*.

This second edition cancels and replaces the first edition (ISO 6941:1984), which has been technically revised.

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Introduction

This method is one of two closely related methods of test for the inflammability of textile fabrics. This method determines the “flame spread time” — vocabulary in relation to the term defined in ISO 4880 — the other method observes and measures “ease of ignition” (see ISO 6940).

This method assesses the properties of textile fabrics in response to flame contact under controlled conditions. Results may not apply to situations where there is restricted air supply or exposure to large sources of intense heat.

The influence of seams on the behaviour of fabrics can be determined by this method, the seam being positioned within the test specimen so as to be subjected to the test flame. Whenever practicable, trimmings should be tested as part of the fabric assembly on which they are or will be used.

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Textile fabrics — Burning behaviour — Measurement of flame spread properties of vertically oriented specimens

1 Scope

This International Standard specifies a method for the measurement of flame spread times of vertically oriented textile fabrics and industrial products in the form of single or multi-component fabrics (coated, quilted, multilayered, sandwich combinations, and similar combinations) when subjected to a small, defined flame.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4880:1997, *Burning behaviour of textiles and textile products — Vocabulary*

ISO 6940, *Textile fabrics — Burning behaviour — Determination of ease of ignition of vertically oriented specimens*

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3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

flame application time

time for which the ignition flame is applied to the test specimen

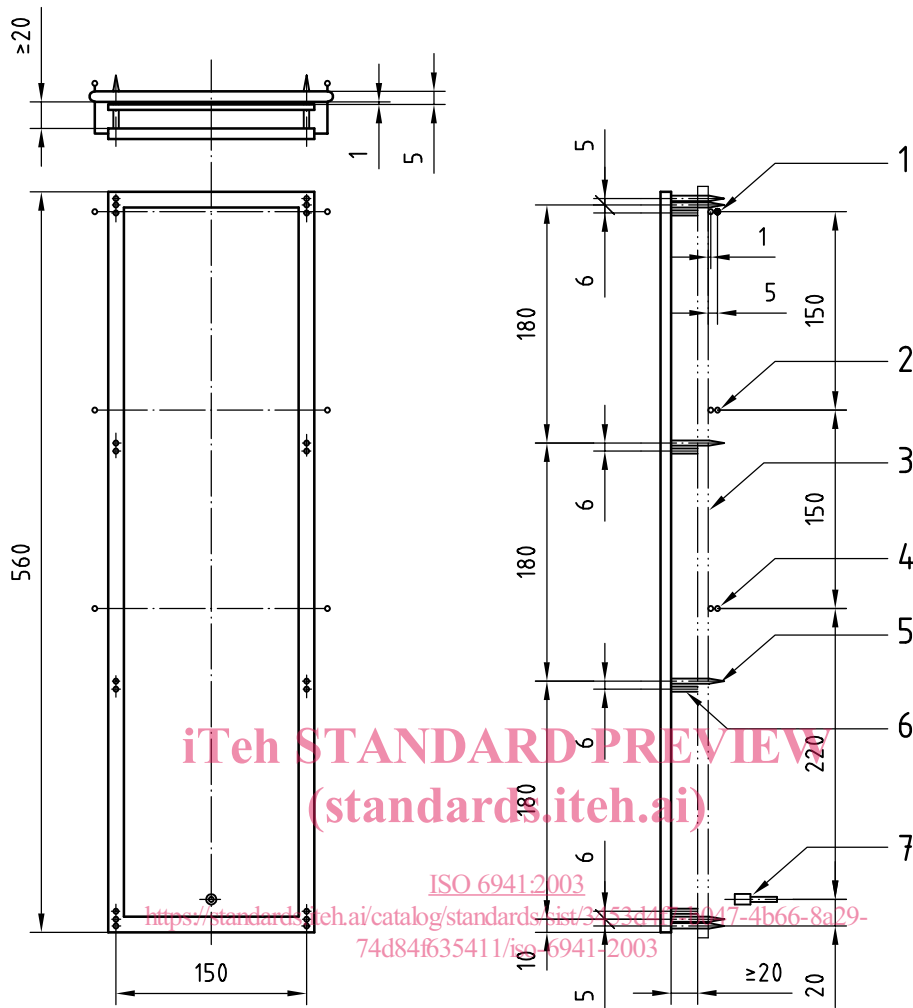
3.2

flame spread time

time taken by a flame on a burning material to travel a specified distance under specified test conditions

4 Principle

A defined flame from a specified burner is applied for 10 s to the surface or the bottom edge of textile specimens that are vertically oriented. The flame spread times in seconds for the flame front to travel between marker threads positioned adjacent to the surface of the test specimen and located at three distances from the igniting flame, are recorded.



Key

- 1 third marker thread
- 2 second marker thread
- 3 fabric specimen
- 4 first marker thread
- 5 mounting pins
- 6 spacer stubs (optional)
- 7 burner (oriented for surface ignition)

Figure 2 — Specimen holder

5.2 Gas burner, as shown in Figure 1 and described in Annex A, capable of being moved from a standby position, where the tip of the burner is at least 75 mm from the test specimen to either the horizontal or inclined operating position, see Figure 3.

5.3 Specimen holder, consisting of a rectangular metal frame having 12 specimen support pins mounted along the longer edge of the rectangle of length 560 mm by width 150 mm, see Figure 2. The pins for supporting the specimen are 5 mm, 10 mm, 190 mm, 370 mm, 550 mm and 555 mm above the bottom edge of the frame and have a minimum length of 26 mm.

NOTE Longer pins may be needed for mounting thick or multilayer specimens.

For the purpose of locating the specimen in a plane at least 20 mm away from the frame (see 9.1.1 and 9.2.1), a spacer stub of 2 mm diameter and a length of at least 20 mm shall be positioned adjacent to each of the pins, except for the upper and lower pins on each side.

5.4 Template, flat rigid, made of a suitable material and of a size corresponding to the size of the specimen (560 mm × 170 mm) shall be used. Twelve holes, approximately 4 mm in diameter, are drilled along the edges of the template and positioned so that the distances between the centres of the holes correspond to the distance between the pins on the specimen holder (see Figure 2). The holes should be located equidistant about the vertical centreline of the template.

5.5 Gas, commercial grade propane or butane or butane/propane mixtures.

NOTE Commercial grade propane is preferred but other gases may be used.

5.6 Timing device

5.6.1 A timing device to control and measure the flame application time and which can be set at 1 s and adjusted at 1 s intervals with an accuracy of 0,2 s or better.

5.6.2 Three timing devices reading to 0,2 s or better are required to measure the flame spread times. These devices are started simultaneously when the igniting flame is applied and are stopped automatically when the individual marker threads are severed.

5.7 Marker threads, white mercerized cotton thread having a linear density of 45 tex to 50 tex.

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6 Precautions

6.1 Construction of testing equipment.

Some products of combustion are corrosive. The equipment shall be constructed of material that will not be adversely affected by the fumes.

6.2 Location of test apparatus

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 Health and safety of operators

Burning of materials may produce smoke and toxic gases that can affect the health of operators. Between tests, the atmosphere of the testing location, which shall be of adequate dimensions to avoid endangering the health of operators, shall be cleared of smoke and fumes by an extractor fan or other means of ventilation (see 6.2).

NOTE Smoke and fume emission may be subject to national regulations concerning atmospheric pollution control.