

---

HY\_glj`j`Y!'; cf`lj cgh!`l [ cHj`Ub`Yj bYh`lj cgh`bUj d] bc`bUa Yy` Yb]`  
dfYg\_i`yUbWj`fGC`\* - (\$.% , ( žj`\_`f bc`n`Xcdc`b]`ca`'%% - ' Ł

Textile fabrics - Burning behaviour - Determination of ease of ignition of vertically oriented specimens (ISO 6940:1984, including Amendment 1:1993)

Textilien - Brennverhalten - Bestimmung der Entzündbarkeit vertikal angeordneter Proben (ISO 6940:1984, einschließlich Änderung 1:1993)

Textiles - Comportement au feu - Détermination de la facilité d'allumage d'éprouvettes orientées verticalement (ISO 6940:1984, amendement 1:1993 inclus)

<https://standards.iteh.ai/catalog/standards/sist/70190e4a-fl10-49ad-950f-89b09317f3fc/sist-en-iso-6940-1999>

**Ta slovenski standard je istoveten z: EN ISO 6940:1995**

---

**ICS:**

13.220.40	Sposobnost vžiga in obnašanje materialov in proizvodov pri gorenju	Ignitability and burning behaviour of materials and products
59.080.30	Tkanine	Textile fabrics

**SIST EN ISO 6940:1999**

**en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN ISO 6940:1999

<https://standards.iteh.ai/catalog/standards/sist/70190e4a-f110-49ad-950f-89b09317f3fc/sist-en-iso-6940-1999>

EUROPEAN STANDARD

EN ISO 6940

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 1995

ICS 13.220.40; 59.080.30

Descriptors: textiles, fabrics, tests, fire tests, determination, ignition, test equipment, burners

English version

**Textile fabrics - Burning behaviour - Determination  
of ease of ignition of vertically oriented specimens  
(ISO 6940:1984, including Amendment 1:1993)**

Textiles - Comportement au feu - Détermination  
de la facilité d'allumage d'éprouvettes  
orientées verticalement (ISO 6940:1984,  
amendement 1:1993 inclus)

Textilien - Brennverhalten - Bestimmung der  
Entzündbarkeit vertikal angeordneter Proben  
(ISO 6940:1984, einschließlich Änderung 1:1993)

(standards.iteh.ai)

SIST EN ISO 6940:1999

<https://standards.iteh.ai/catalog/standards/sist/70190e4a-fl10-49ad-950f-89b093173fc/sist-en-iso-6940-1999>

This European Standard was approved by CEN on 1995-01-02. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

## CEN

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

## Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 248 "Textiles and textile products", the secretariat of which is held by BSI.

This European Standard shall be given the status of a National Standard, either by publication of an identical text or by endorsement, at the latest by July 1995, and conflicting national standards shall be withdrawn at the latest by July 1995.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

## Endorsement Notice

The text of the International Standard ISO 6940:1984, including Amendment 1:1993 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in annex ZA (normative).

**(standards.iteh.ai)**

SIST EN ISO 6940:1999

<https://standards.iteh.ai/catalog/standards/sist/70190e4a-fl10-49ad-950f-89b09317f3fc/sist-en-iso-6940-1999>



**Annex ZA (Normative) Normative references to International publications with their relevant European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendment to or revisions of any of these publications applies to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

Publication	Year	Title	EN/HD	Year
ISO 139		Textiles - Standard atmospheres for conditioning and testing	EN 20139	

**iTeh STANDARD PREVIEW  
(standards.iteh.ai)**

SIST EN ISO 6940:1999

<https://standards.iteh.ai/catalog/standards/sist/70190e4a-fl10-49ad-950f-89b09317f3fc/sist-en-iso-6940-1999>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN ISO 6940:1999

<https://standards.iteh.ai/catalog/standards/sist/70190e4a-f110-49ad-950f-89b09317f3fc/sist-en-iso-6940-1999>

---

International Standard



6940

---

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

---

## Textile fabrics — Burning behaviour — Determination of ease of ignition of vertically oriented specimens

*Textiles — Comportement au feu — Détermination de la facilité d'allumage d'éprouvettes orientées verticalement*

First edition — 1984-09-15

**ITeH STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN ISO 6940:1999](#)

<https://standards.iteh.ai/catalog/standards/sist/70190e4a-fl10-49ad-950f-89b09317f3fc/sist-en-iso-6940-1999>

---

UDC 677.064 : 620.1 : 677.017.56

Ref. No. ISO 6940-1984 (E)

**Descriptors:** textiles, fabrics, tests, fire tests, determination, ignition, test equipment, burners.

## 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. Every 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 6940 was prepared by Technical Committee ISO/TC 38, *Textiles*.

**iTeh STANDARD PREVIEW**  
(standards.iteh.ai)

SIST EN ISO 6940:1999

<https://standards.iteh.ai/catalog/standards/sist/70190e4a-fl10-49ad-950f-89b09317f3fc/sist-en-iso-6940-1999>



# Textile fabrics — Burning behaviour — Determination of ease of ignition of vertically oriented specimens

## 1 Scope and field of application

This International Standard specifies 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, multilayered, sandwich construction and similar combinations) fabrics.

**This method should be used solely to assess the properties of materials or systems in response to heat and flame under controlled conditions. Results may not apply to situations where there is restricted air supply or prolonged exposure to large sources of intense heat as in a conflagration.**

## 2 References

ISO 139, *Textiles — Standard atmospheres for conditioning and testing.*

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

ISO 4916, *Textiles — Seam types — Classification and terminology.*

## 3 Definition

For the purpose of this International Standard, the following definition applies (see ISO 4880):

**3.1 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 annex 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 is required. 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 figure 1). The holes shall be located equidistant about the vertical centrelines of the template (see the note in 7.2).

### 6.4 Specimen holders

**6.4.1** Two specimen holders, each consisting of a metal frame on which are mounted 4 pins to support the test specimen (see figure 1). One specimen holder (No. 1) is for specimens 80 mm × 80 mm, the other specimen holder (No. 2) is for specimens 200 mm × 80 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 — For the purpose of locating the specimen in a plane away from the frame, spacer stubs 2 mm diameter may be provided adjacent to the pins.

**6.4.2** If provision is made for multiple testing of specimens on the No. 1 specimen holder, the location of the pins shall be such that a space of 10 mm is provided between adjacent mounted specimens.

## ISO 6940-1984 (E)

### 6.5 Gas burner

A gas burner as described in annex 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. 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 as follows (see 8.6):

- a) for frame 1: 80 mm × 80 mm, tolerance  $\begin{matrix} +5 \\ 0 \end{matrix}$   
(Figure 1, dimension  $X = 70$ )
- b) for frame 2: 200 mm × 80 mm, tolerance  $\begin{matrix} +5 \\ 0 \end{matrix}$   
(Figure 1, dimension  $X = 190$ )

### 7.2 Pin location marks

Place the template (see 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 8.8). For surface ignition, where the two surfaces of the specimen are dissimilar or preliminary examination indicates it (see annex C), each face of the sample shall be tested in this manner (see 8.8 and 8.9).

### 7.4 Conditioning of test specimens

Condition test specimens in one of the following ways:

- a) in the standard temperate atmosphere of  $20 \pm 2$  °C and  $(65 \pm 2)$  % rh in accordance with ISO 139;
- b) drying in an oven at  $105 \pm 2$  °C for not less than 1 h, then cooling in a desiccator for at least 30 min; or
- c) any other conditioning atmosphere as agreed by the interested parties.

## 8 Procedure

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

**8.2** Light the burner and preheat it for 2 min. Adjust the flame height to  $40 \pm 2$  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 7.2.)

**8.5** For all fabrics, position the burner as described in 8.5.1. Where a fabric intended for curtains and drapes fails to ignite in the position of the burner described in 8.5.1, the fabric may be ignited by the method described in 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 figure 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 figure 2b)], such that the longitudinal axis is inclined upwards at 30° 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 × 80 mm specimen on frame No. 1 for a time period which preliminary testing indicates will approximate to 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 if the specimen burns to the top or to the vertical edges of the specimen, after removal of the igniting flame.

**8.7** If the specimen burns to the top edge of the specimen during application of the igniting flame, or within 5 s of removing the igniting flame, retest the sample using a 200 mm × 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 time 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 continuing 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" 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 annex 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 9.1.1 relate to ignition, subtract 0,5 from the mean value calculated in 9.1.1. If the data used in 9.1.1 relate to non-ignition, add 0,5 to the mean value calculated in 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

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 International Standard and details of alterations to it, if any;
- b) date of test;
- c) conditioning atmosphere used for the test specimens (see 7.4);
- d) ambient conditions of temperature, relative humidity and barometric pressure in the area in which the test is carried out;
- e) techniques used to attach fabrics which cannot be supported on the pins;
- f) gas used to ignite the test specimens;
- g) identification of the fabric tested;
- h) size of specimen used (see 7.1);
- i) orientation of the burner for igniting the test specimen (see 8.5);
- k) if the fabric did not ignite in 20 s;
- m) a tabulation for each direction in the case of edge ignition or each surface and direction in the case of surface ignition (see 7.3), of the number of cases of ignition and non-ignition observed at each timer setting used during the test (see annex B, Tables 1 and 2);
- n) 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 9.1);
- p) minimum ignition time of the textile material as the lowest of the mean ignition times for each specimen.

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

SIST EN ISO 6940:1999

<https://standards.iteh.ai/catalog/standards/sist/70190e3a-5111-49ad-950f-820093171810/sist-en-iso-6940-1999>