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**Textiles — Burning behaviour of bedding  
items —**

**Part 1:**

General test methods for the ignitability by  
a smouldering cigarette

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*Textiles — Comportement au feu des articles de literie —*

*Partie 1: Méthodes d'essai générales pour l'allumabilité par une cigarette  
en combustion*

[ISO 12952-1:1998](#)

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## Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 part of ISO 12952 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 12952-1 was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee TC 38, *Textiles*, Subcommittee SC 19, *Burning behaviour of textiles and textile products*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this standard, read “..this European Standard...” to mean “...this International Standard...”.

ISO 12952 consists of the following parts, under the general title *Textiles — Burning behaviour of bedding items*:

- *Part 1: General test methods for the ignitability by a smouldering cigarette*
- *Part 2: Specific test methods for the ignitability by a smouldering cigarette*
- *Part 3: General test methods for the ignitability by a small open flame*
- *Part 4: Specific test methods for the ignitability by a small open flame*

Annex A of this part of ISO 12952 is for information only.

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## Foreword

The text of EN ISO 12952-1:1999 has been prepared by Technical Committee CEN/TC 248 "Textiles and textile products", the secretariat of which is held by BSI, in collaboration with Technical Committee ISO/TC 38 "Textiles".

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 1999, and conflicting national standards shall be withdrawn at the latest by July 1999.

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

## Introduction

Fires are sometimes caused by the ignition of bedding items by smokers' materials; the ignitability of bedding items by a smouldering cigarette or a small open flame is therefore an important feature in the assessment of the risk of fire.

It cannot be assumed that protection against a smouldering ignition source will automatically give protection against flaming ignition. Users of this draft standard should, thus, consider the need to submit test specimens to both cigarette and flaming ignition tests.

EN ISO 12952-1 and EN ISO 12952-2 describes a test method with the smouldering cigarette as ignition source. Testing against the ignition source of a small open flame forms the contents of EN ISO 12952-3 and EN ISO 12952-4.

This European Standard can be used for the assessment of ignitability of individual items of bedding and of composite arrangements.

EN ISO 12952-1 and EN ISO 12952-3 describe general test methods procedure and aspects of testing common to all bedding items; EN ISO 12952-2 and EN ISO 12952-4 contain all details necessary for the testing of the specific bedding items.

**WARNING:** This test relates only to the ignitability of materials under the particular conditions of test. It is not intended as a means of assessing the full potential fire hazard of the bedding item in use.

Particular attention is drawn to the possibility of ignition of lower parts of a bedding assembly when using bedding items which are not themselves ignited.

## 1 Scope

This European Standard specifies a general test method common to all bedding items, for assessment of their ignitability when subjected to a smouldering cigarette.

EN ISO 12952-2 describes a specific test method for bedding items, which can normally be placed on a mattress, for example:

- mattress covers;
- underlays;
- incontinence-sheets and -pads;
- sheets;
- blankets;
- electric blankets;
- quilts (duvets) and covers;
- pillows (whatever the filling) and bolsters;
- pillowcases.

This standard does not apply to mattresses, bed-bases and mattress pads.

## 2 Normative references

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 amendments to or revisions of any of these publications apply to this draft European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN ISO 12952-2	Textiles - Burning behaviour of bedding items - Part 2: Specific test methods for the ignitability by a smouldering cigarette (ISO 12952-2:1999)
EN ISO 3175	Textiles - Evaluation of stability to machine dry-cleaning (ISO 3175:1995)
EN 26330	Textiles - Domestic washing and drying procedures for textile testing (ISO 6330:1984)
ISO/IEC GUIDE 52	Glossary of fire terms and definitions

## 3 Definitions

For the purposes of this European Standard, the definitions given in ISO/IEC Guide 52 and the following definitions apply:

- 3.1 bed: Mattress placed on top of a bed base with no other bedding items present.
- 3.2 bed assembly: Stack of successive layers of mattress and various bedding items, with or without pillow and pillowcase, representing a section through the centre of a made-up bed.
- 3.3 bed base: Structure that supports the mattress.
- 3.4 bedding: General term for all items placed on the mattress or the bed by a user to provide comfort and warmth and for decorative purposes. This term includes sheets, blankets, bed spreads, valances, quilts, duvets, quilt covers and mattress covers.

- 3.5 bolster: Long round pillow or cushion.
- 3.6 duvet: Bedding item made principally from a woven material and filled e.g. with down, feathers or filling fibres (the duvet can be quilted in various ways).
- 3.7 incontinence sheet: Sheet to protect the mattress and bedding for incontinent people.
- 3.8 mattress: Product in the form of a resilient material, or padding material in combination with steel springs enveloped by a cover fabric.
- 3.9 mattress cover: Secondary covering material that can be removed for laundering purposes.
- 3.10 mattress pad: Thin filled bedding item, covered usually with a woven material. It is placed on the mattress to protect it and to add to the comfort of the bed.
- 3.11 made-up bed: Bed prepared for use by covering with bedding items.
- 3.12 pillow: Cushion for a sleeper's head; any object used for that purpose.
- 3.13 quilt: Bedcover of two thicknesses with padding sewn in compartments.
- 3.14 underlay: Textile layer between the mattress and the lower sheet.

#### 4 Principle

A test specimen placed on a testing substrate is subjected to a smouldering cigarette placed on top of and/or below the test specimen (see EN ISO 12952-2). Any progressive smouldering and/or flaming is noted.

Where the actual mattress is known, it can replace the testing substrate.

#### 5 Criteria of ignition

##### 5.1 Progressive smouldering ignition

For the purposes of this European standard, all the following types of behaviour given in a) to d) are considered to be progressive smouldering ignition:

- a) any test specimen that displays escalating combustion behaviour so that it is unsafe to continue the test and requires forcible extinction;
- b) any test specimen that smoulders until it is essentially consumed within the test duration;
- c) any test specimen that produces externally detectable amounts of smoke, heat or glowing after a period of 1 h following the application of the smouldering cigarette;
- d) any test specimen that, on final examination, shows evidence of smouldering other than discolouration more than 50 mm in any horizontal direction from the nearest part of the original position of the cigarette.

NOTE: In practice, it has been found that there is usually a clear distinction between materials which can char under the influence of the smouldering cigarette but which do not propagate further (non-progressive) and those where smouldering develops and spreads (progressive).

## 5.2 Flaming ignition

The following behaviour is considered to be flaming ignition: the occurrence of any flames initiated by a smouldering cigarette.

## 6 Health and safety of operators

There is considerable risk with these tests and it is essential that suitable precautions be taken, which may include the provision of breathing apparatus and protective clothing.

### 6.1 Enclosure

For safety, the tests shall be conducted in a suitable fume cupboard or purpose-built room so that individuals are not exposed to fumes (see 7.4).

### 6.2 Extinguishers

Readily accessible suitable means of extinguishing the test specimens shall be provided. Extinction of test specimens can be difficult and care should be taken that they are only disposed of when completely inert. It can be necessary to immerse smouldering specimens in water, or place them in a sealed non-combustible enclosure. To ensure complete safety, other suitable steps can be required.

## 7 Apparatus

### 7.1 Test rig

A suitable test rig is illustrated in figure 1. It consists of a platform of open mesh ( $400 \pm 50$ ) mm supported by solid base. The test rig shall correspond to the dimensions of the test specimen, but can be larger than the test specimen.

The size of the mesh is not critical, nor are the angle iron dimensions in figure 1.

For the tests, the rig is placed within the test enclosure (see 7.4).

### 7.2 Clock

A stop clock reading to the nearest second and capable of measuring for at least 1 h.

### 7.3 Ignition source: Smouldering cigarette

A cigarette without filter complying with the following requirements:

- length : ( $70 \pm 4$ ) mm;
- diameter : ( $8 \pm 0,5$ ) mm;
- mass : ( $1 \pm 0,1$ ) g;
- smouldering rate ( $12,0 \pm 3,0$ ) min / 50 mm, when tested in the following way.

Mark the cigarette, conditioned as described in 9.1, at 5 mm and 55 mm from the end to be lit. Light it as described in 11.2 and impale it horizontally in air (draught 0,02 m/s to 0,2 m/s) on a horizontal wire spike inserted no more than 13 mm into the unlit end. Record the time taken to smoulder from the 5 mm mark to the 55 mm mark.

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#### 7.4 Test enclosure

A suitable room with volume greater than 20 m<sup>3</sup>, which contains adequate oxygen for testing, or a smaller enclosure with a throughflow of air equipped with inlet and extraction systems. Air flow rates shall not exceeded 0,2 m/s in the locality of the test specimen position. This limit provides adequate oxygen without disturbing the burning behaviour.

#### 7.5 Testing substrate

The testing substrate, which is used to simulate the mattress, over which the bedding items are tested, shall be a mineral wool fibre pad having a thermal conductivity of 0,04 W/m·K.

The nominal dimensions of the testing substrate are 450 mm x 450 mm x 25 mm thickness (see figure 2). The procedure used is laid down in EN ISO 12952-2.

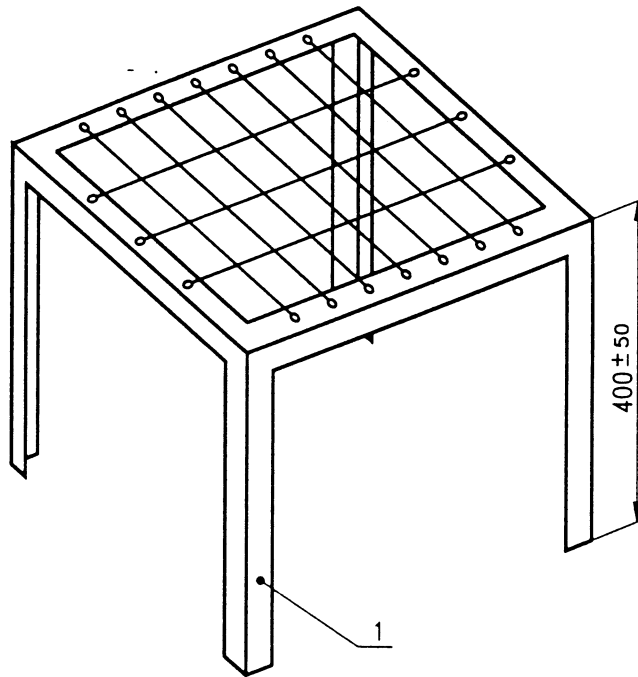
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Dimensions in millimetres



1 Nominal 25x25x3 angle iron

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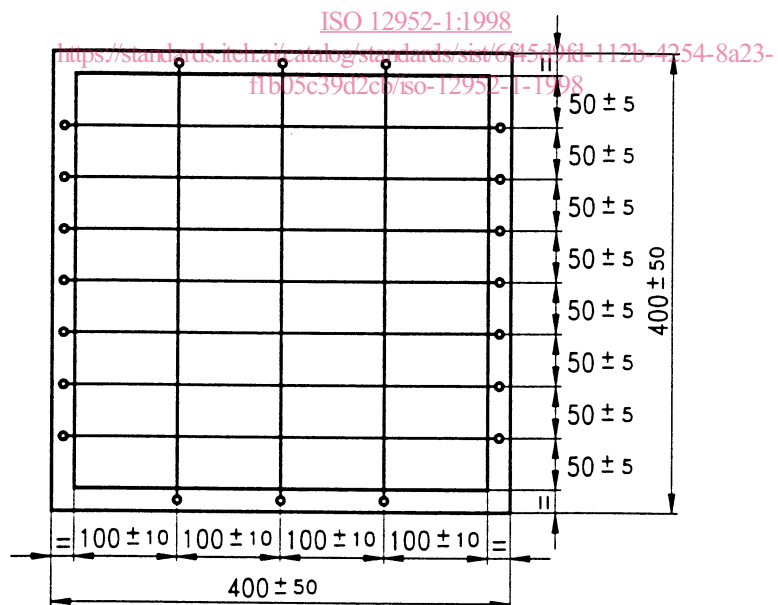


Figure 1 : Test rig