INTERNATIONAL STANDARD

ISO 12952-1

Second edition
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Textiles — Assessment of the ignitability of bedding items —

Part 1: Ignition source: smouldering cigarette

Textiles — Évaluation de l'allumabilité des articles de literie —

Partie 1: Source d'allumage: cigarette en combustion

Reference number
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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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 12952-1 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 248, *Textiles and textile products*, in collaboration with Technical Committee ISO/TC 38, *Textiles*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces ISO 12952-1:1998 and ISO 12952-2:1998, which have been technically revised.

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

— *Part 1: Ignition source: smouldering cigarette*

— *Part 2: Ignition source: match-flame equivalent*

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 part of ISO 12952 should therefore consider the need to submit test specimens to both cigarette and flaming ignition tests.

This part of ISO 12952 describes test methods with a smouldering cigarette as the ignition source. Testing against the ignition source of a small open flame is covered in ISO 12952-2.

This part of ISO 12952 can be used for the assessment of ignitability of individual items of bedding and of composite arrangements.

Textiles — Assessment of the ignitability of bedding items —

Part 1:
Ignition source: smouldering cigarette

WARNING — This test relates only to the ignitability of materials under the particular conditions of testing. 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. The performance of beds and mattresses requires reference to testing and performance standards other than those described in this part of ISO 12952.

1 Scope

This part of ISO 12952 specifies test methods for assessing the ignitability of all bedding items when subjected to a smouldering cigarette.

This part of ISO 12952 applies to 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 part of ISO 12952 does not apply to mattresses, bed bases and mattress pads.

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 3175-2, *Textiles — Professional care, drycleaning and wetcleaning of fabrics and garments — Part 2: Procedure for testing performance when cleaning and finishing using tetrachloroethene*

ISO 3175-3, *Textiles — Professional care, drycleaning and wetcleaning of fabrics and garments — Part 3: Procedure for testing performance when cleaning and finishing using hydrocarbon solvents*

ISO 3175-4, *Textiles — Professional care, drycleaning and wetcleaning of fabrics and garments — Part 4: Procedure for testing performance when cleaning and finishing using simulated wetcleaning*

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

ISO 6330:2000, *Textiles — Domestic washing and drying procedures for textile testing*

ISO 10528, *Textiles — Commercial laundering procedure for textile fabrics prior to flammability testing*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4880 and the following 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 a 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/or for decorative purposes, for example, 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, for example, with down, feathers or filling fibres

NOTE A 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, usually covered with a woven material, 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 or any object used for that purpose

3.13
quilt
bedcover of two thicknesses with padding sewn into 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. Any progressive smouldering and/or flaming is noted.

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

5 Criteria of ignition

5.1 Progressive smouldering ignition

All the types of behaviour given in a) to d) are considered to be progressive smouldering ignition:

a) any test specimen that displays escalating combustion behaviour, making it unsafe to continue the test, and that requires forcible extinction;

b) any test specimen that smoulders until it is essentially consumed, after a period of 1 h following the application of the smouldering cigarette;

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 (see Clause 12), shows evidence of active smouldering.

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

WARNING — There is a 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.

In the interest of 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).

Readily accessible suitable means of extinguishing the test specimens shall be provided. Extinction of test specimens can be difficult and care should be taken to dispose of them only when they are 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 of at least 450 mm × 450 mm, supported by a 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 and the angle iron dimensions in Figure 1 are not critical.

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

7.2 Stopwatch

A stopwatch shall be used, capable of reading to the nearest second and measuring for at least 1 h.

7.3 Ignition source: smouldering cigarette

An un-tipped cylindrical cigarette complying with the following requirements shall be used.

— length: (68 ± 2) mm;

— diameter: (8,0 ± 0,5) mm;

— mass: (0,95 ± 0,10) g.

The smouldering rate shall be (8 ± 2) min/40 mm, when tested as follows.

Mark the cigarette, conditioned as described in 9.1, at 10 mm and 50 mm from the end to be lit. Light it as described in 11.2 and impale it horizontally in air (air flow rate less than 0,2 m/s) on a horizontal wire spike inserted not more than 13 mm into the unlit end. Record the time taken for it to smoulder from the 10 mm mark to the 50 mm mark. The smouldering rate may be measured on two cigarettes at the same time. The distance between cigarettes and between each cigarette and any nearby surface, such as the wall or floor of the test enclosure, shall be at least 150 mm.

7.4 Test enclosure

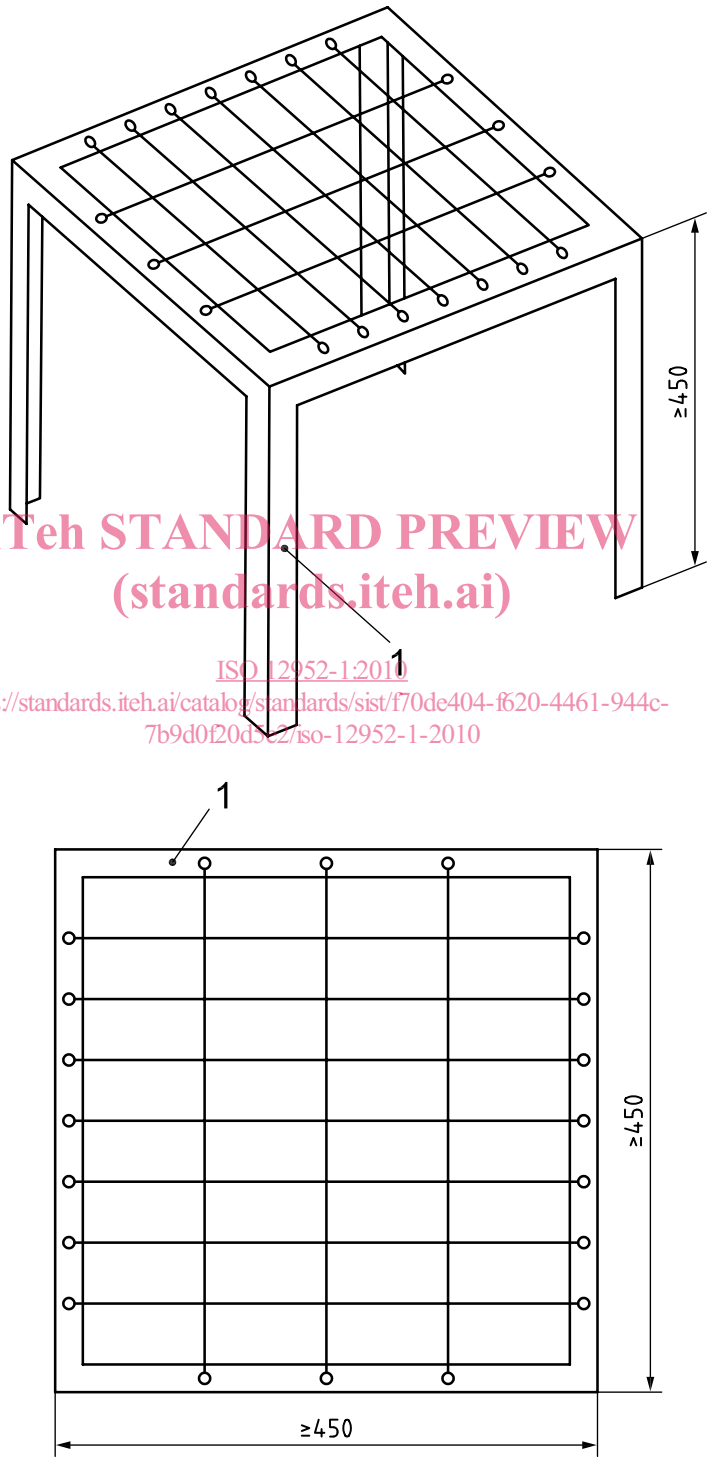
A suitable room with a volume greater than 20 m^3, which contains adequate oxygen for testing, or a smaller enclosure with a through-flow of air equipped with inlet and extraction systems shall be used. Air flow rates shall not exceeded 0,2 m/s in the locality of the test specimen position. This limit 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 testing substrate shall correspond to the size of the test rig (±10 mm) and have a thickness of (25 ± 5) mm (see Figure 2).

Dimensions in millimetres



Key

1 angle iron

Figure 1 — Example of a test rig