
**Pohištvo - Ugotavljanje vžiglјivosti postelјnih vložkov in oblazinjenih podnožij - 2.
del: Vir vžiga: enakovreden plamenu vžigalice**

Furniture - Assessment of the ignitability of mattresses and upholstered bed bases - Part
2: Ignition source: Match flame equivalent

Möbel - Bewertung der Entzündbarkeit von Matratzen und gepolsterten Bettböden - Teil
2: Zündquelle: Eine einem brennenden Streichholz vergleichbare Gasflamme

Ameublement - Evaluation de l'allumabilité des matelas et des sommiers rembourrés -
Partie 2: Source d'allumage: Equivalente a l'allumette

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97.140	Pohištvo	Furniture

SIST EN 597-2:1995**en**

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EUROPEAN STANDARD

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English version

**Furniture - Assessment of the ignitability of
mattresses and upholstered bed bases - Part 2:
Ignition source: Match flame equivalent**

Ameublement - Evaluation de l'allumabilité des
matelas et des sommiers rembourrés - Partie 2:
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CEN

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

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

Contents	Page
Foreword	3
0 Introduction	3
1 Scope	3
2 Definitions	3
2.1 progressive smouldering	3
2.2 flaming	4
2.3 flammability	4
2.4 ignitability	4
2.5 ignition source	4
2.6 mattress pad	4
2.7 mattress	4
2.8 bed base	4
2.9 upper surface	4
3 Criteria of ignition	4
3.1 Progressive smouldering ignition	4
3.2 Flaming ignition	5
4 Principle	5
5 Health and safety of operators	5
5.1 General	5
5.2 Enclosure	5
5.3 Extinguishers	5
6 Apparatus	6
6.1 Test rig	6
6.2 Test enclosure	6
6.3 Clock	7
6.4 Ignition source : Match flame equivalent	7
6.5 Gas flow control	7
6.6 Dimensional measurements	7
7 Atmosphere for conditioning and testing	8
7.1 Conditioning	8
7.2 Testing	8
8 Test specimen	8
8.1 Small scale	8
8.2 Full size	8
9 Test procedure	8
9.1 Preparation	8
9.2 Ignition source application	9
9.3 Final examination	9
10 Test report	10
Annex A (informative)	
Model report form	11

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Foreword

This European Standard was issued by the Technical Committee CEN/TC 207 "Furniture", of which the secretariat is held by IBN.

The text is based on EN 1021-2 "Furniture - Assessment of the ignitability of upholstered furniture - Part 2: Ignition source : Match flame equivalent".

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 May 1995, and conflicting national standards shall be withdrawn at the latest by May 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.

0 Introduction

This standard is one of a series of standards concerned with the ignitability of mattresses and upholstered bed bases using different ignition sources. The ignition source used in this standard is a gas flame which is equivalent to a match flame.

When mattresses or bed bases are used or stored on their own, it is necessary and desirable to know their ignitability in their own right.

It cannot be assumed that protection against flaming sources will automatically give protection against smouldering ignition. Users of the standard should therefore recognize the need to submit test specimens to both a gas flame equivalent to a match flame and cigarette ignition tests.

WARNING :

Attention is drawn to the fact that the tests given in this part of the standard relate to the ignitability of the materials described in the test report (see clause 10) and are not intended to reproduce the full fire hazards that may be encountered.

1 Scope

This standard lays down a test method to assess the ignitability of mattresses, upholstered bed bases or mattress pads, when subjected to a gas flame equivalent to a match flame.

Air mattresses and water beds are excluded from this standard.

2 Definitions

For the purposes of this standard, the following definitions apply :

2.1 progressive smouldering

Exothermic oxidation, not accompanied by flaming, that is self-propagating, i.e. independent of the ignition source. It may or may not be accompanied by incandescence.

2.2 flaming

Undergoing combustion in the gaseous phase with the emission of light.

2.3 flammability

The ability of a material or product to burn with a flame under specified test conditions.

2.4 ignitability

A measure of the ease with which a material, product or component can be ignited so as to flame or progressively smoulder.

2.5 ignition source

Source of energy used to ignite combustible materials or products.

2.6 mattress pad

An upholstered product, in some cases used in conjunction with, and to complement, a mattress or upholstered bed base. This product is not intended to be used separately.

2.7 mattress

An upholstered product intended for sleeping upon.

2.8 bed base

A structure which supports the mattress or mattress pad.

2.9 upper surface

The surface of a bed base that supports a mattress or the surface(s) of a mattress that support(s) a user.

3 Criteria of ignition

3.1 Progressive smouldering ignition

For the purposes of this standard, all the following types of behaviour are considered to be progressive smouldering ignitions :

- a) any test specimen that displays escalating combustion behaviour so that it is unsafe to continue the test and active extinction is necessary ;
- b) any test specimen that smoulders until it is essentially consumed within the test duration ;
- c) any test specimen that smoulders to its full thickness within the duration of the test ;
- d) any test specimen that smoulders for more than one hour ;
- e) any test specimen that, on final examination (see 9.3), shows evidence of charring other than discolouration more than 50 mm in any horizontal direction from the nearest point of the original

position of the source.

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

3.2 Flaming ignition

For the purposes of this standard, all the following types of behaviour are considered to be flaming ignition.

- a) any test specimen that displays escalating combustion behaviour so that it is unsafe to continue the test and active extinction is required ;
- b) any test specimen that burns until it is essentially consumed within the test duration ;
- c) any test specimen on which any flame front reaches its extremities or passes through its full thickness within the duration of the test ;
- d) any flaming that continues to more than 120 s after removal of the burner tube.

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4 Principle

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To subject a full upper surface or upper surface characteristic features of the mattress, the mattress pad or of the bed base to the contact of a gas flame which is equivalent to a match flame by disposing the gas flame so that all the zones having different characteristics are tested.

5 Health and safety of operators

5.1 General

The test method specified in this standard presents a considerable hazard ; suitable precautions shall be taken, which may include the provision of breathing apparatus and protective clothing.

5.2 Enclosure

For safety, the tests should be conducted in a suitable fume cupboard or purpose built room, in accordance with 6.2, so that individuals are not exposed to any fumes.

5.3 Extinguishers

Adequate means of extinguishing the assembly should be provided bearing in mind that some combinations may produce severe flaming during the test. A hand and/or fixed water spray, which can be directed over the burning area, can be useful. Other means, such as fire extinguishers (water and halogenated hydrocarbons), fire blankets and a bucket of water will assist.

In some cases, smouldering may be difficult to extinguish completely and complete immersion in water may be necessary.

6 Apparatus

6.1 Test rig

Consisting of a platform of expanded steel or open mesh of at least 450 mm x 450 mm supported at least 75 mm above a solid base (a suitable test rig mesh is illustrated in figure 1). The size of the mesh is not critical.

For the tests, the rig is sited within the enclosure (see 6.2) and the testing is performed in a substantially draught-free environment permitting an adequate supply of air.

Dimensions in millimetres

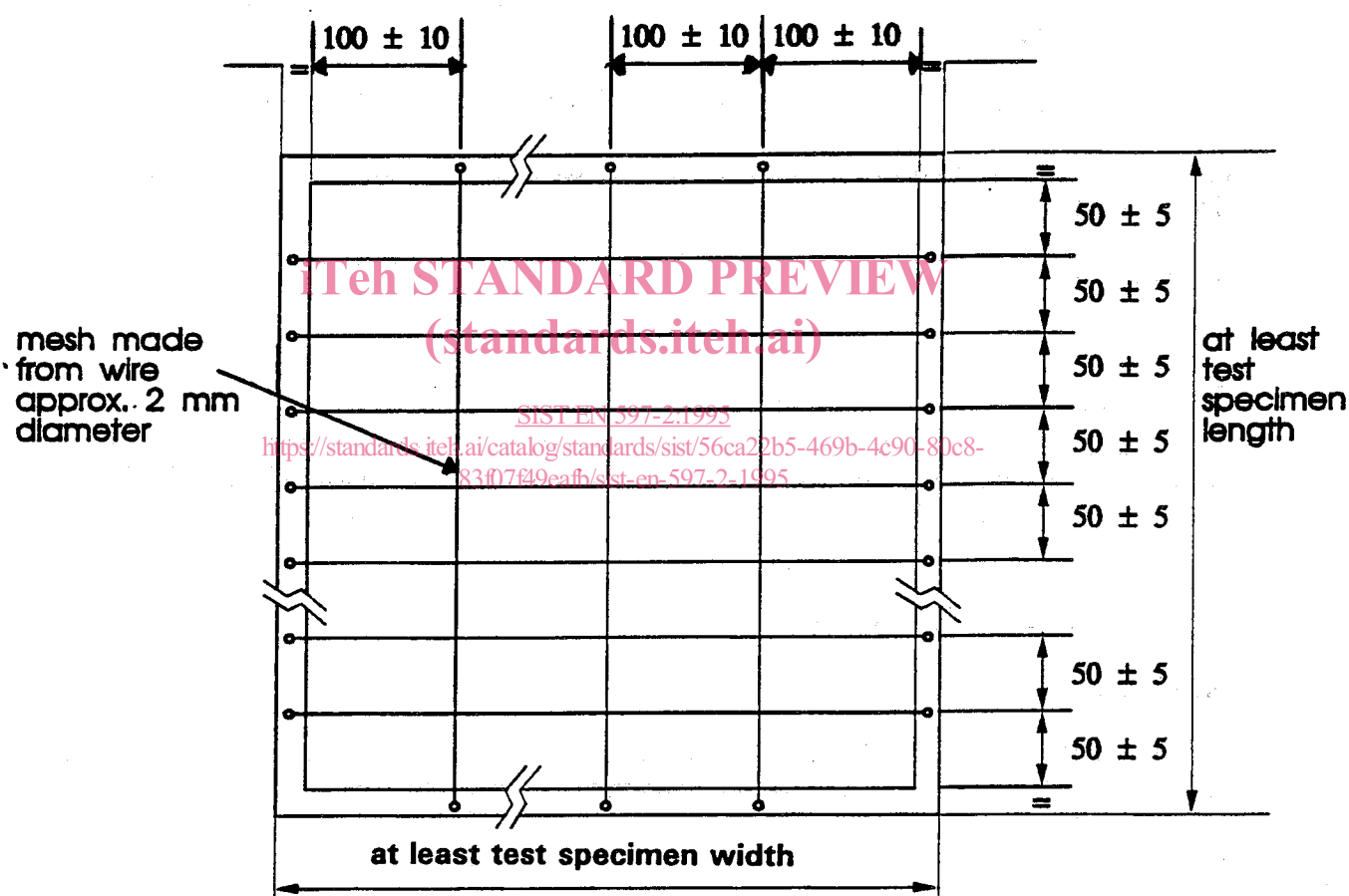


Figure 1 - Test rig mesh
Spacing of wire mesh platform

6.2 Test enclosure

The test enclosure consists of either a room with a volume greater than 20 m³, (which contains adequate oxygen for testing), or a smaller enclosure with a through flow of air. Inlet and extraction systems, providing air flow rates < 0,2 m/s in the locality of the rig, provide adequate oxygen without disturbing the burning behaviour.

6.3 Clock

The clock shall be capable of measuring to at least 1 h with an accuracy of 1 s.

6.4 Ignition source : Match flame equivalent

NOTE : This source has been designed to give a calorific output approximating to that of a burning match.

A burner tube, consisting of a length of stainless steel tube [(8 ± 0,1) mm outside diameter, (6,5 ± 0,1) mm internal diameter and (200 ± 5) mm in length] is connected by flexible tubing to a cylinder containing butane via a flowmeter, fine control valve, on-off valve (optional) and cylinder regulator providing outlet pressure of nominal 2,8 kPa¹⁾.

The flowmeter should be calibrated to supply a butane gas flow rate at 25 °C of (45 ± 2) ml/min. The flexible tubing connecting the output of the flowmeter to the burner tube should be 2,5 m to 3 m in length with an internal diameter of (7 ± 1) mm.

This corresponds to a flame height of approximately 35 mm at 25 °C.

6.5 Gas flow control

It is essential that the rate of supply of gas to the burner tube conforms to the flow rate specified. Some difficulties have been reported with the supply and measurement of the gas, particularly where the gas cylinder has, of necessity, to be stored in an environment cooler than the defined test conditions and/or at some distance from the test rig.

In these cases, and in other situations where difficulties occur, it is important that there should be a sufficient length of tubing inside the controlled environment (10 °C to 30 °C) to ensure that the gas reaches the required temperature before flow measurement. One way to assist this is to pass the gas (before flow measurement) through a metal tube immersed in water maintained at 25 °C so that flow corrections for temperature variations can be avoided.

Great care also needs to be exercised with the measurement and setting of the flow rate of the gas. Direct reading flowmeters, even those obtained with a direct gas calibration, need to be checked when initially installed and also at regular intervals during testing by a method capable of accurately measuring the absolute gas flow at the burner tube. One way of doing this is to connect the burner tube with a short length of tubing (about 7 mm inside diameter) to a soap bubble flowmeter, such that the upward passage of a soap film meniscus in a glass tube of calibrated volume (e.g. a burette) over a known period of time gives an absolute measurement of the flow.

6.6 Dimensional measurements

All dimensional measurements shall be given with an accuracy of ± 1 mm.

¹⁾ 1 kPa = 10³ N/m² = 10 mbar.