

Reaction to fire tests — Ignitability of building products subjected to direct impingement of flame —

Part 2: Single flame source test

ICS 13.220.50

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National foreword

This British Standard reproduces verbatim ISO 11925-2:1997, including Technical Corrigendum 1:1998, and implements it as the UK national standard.

The UK participation in its preparation was entrusted by Technical Committee FSH/21, Reaction to fire tests, to Subcommittee FSH/21/2, Ignitability tests, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

The following errors have been identified in this document:

1. Page 1, clause **3.2 b) ii)**, second line — replace the full stop with a comma and replace “T” with “t”.
2. Page 2, clause **6.2**, first line, correct the length of the specimen to $(340 \pm \text{mm})$.
3. Page 3, clause **6.6**, first line — replace “end mixtures” with “admixtures”.
4. Page 4, clause **8.2.2**, first line — replace “at” with “to”.
5. Page 16, fourth paragraph, first line, replace “thumbscrew” with “wing nut”.
6. Page 16, clause **B.5.1 b)**, second line — replace “30 min” with “3 min”.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the ISO title page, pages ii to iv, pages 1 to 22 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

INTERNATIONAL STANDARD

ISO
11925-2

First edition
1997-06-15

Reaction to fire tests — Ignitability of building products subjected to direct impingement of flame —

Part 2: Single flame source test

*Essais de réaction au feu — Allumabilité des produits du bâtiment soumis
à l'incendie directe de la flamme —*

Partie 2: Essai à l'aide d'une source à flamme unique



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Descriptors: Buildings, fire protection, building components, construction materials, tests, fire tests, flammability testing, determination, ignitability.

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.

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 11925-2 was prepared by Technical Committee ISO/TC 92, *Fire safety*, Subcommittee SC 1, *Reaction to fire*.

ISO 11925 consists of the following parts under the general title *Reaction to fire tests — Ignitability of building products subjected to direct impingement of flame*:

- *Part 2: Single flame source test*;
- *Part 3: Multi-source test*.

Part 1 is under preparation.

Annex A to Annex C of this part of ISO 11925 are for information only.

Introduction

Fire is a complex phenomenon; its behaviour and effects depend upon a number of interrelated factors. The behaviour of materials and products depends upon the characteristics of the fire, the method of use of the materials and the environment in which they are exposed. The philosophy of “reaction to fire tests” is explained in ISO/TR 3814.

A test such as is specified in this part of ISO 11925 deals only with a simple representation of a particular aspect of the potential fire situation typified by the impingement of a small flame on a vertical product. It cannot alone provide any direct guidance on behaviour in fire.

A test of this type may, however, be used for comparative purposes or to ensure the existence of a certain quality of performance (in this case ignitability) considered to have a bearing on fire performance generally. It would be wrong to attach any other meaning to performance in this test.

Further development of this method is currently being undertaken in other international fora and this work will be closely monitored by ISO/TC 92, in particular, research on the design of specimen holder and the suitability of the cotton wadding.

The term “ignitability” is defined in ISO/IEC Guide 52 as the measure of the ease with which a specimen can be ignited due to the influence of an external heat source under specific test conditions. It is one of the first fire properties to be manifest and should almost always be taken into account in any assessment of fire hazard. It may not, however, be the main characteristic of the material which affects the subsequent development of fire in a building.

This test does not rely on the use of asbestos-based materials.

CAUTION — So that suitable precautions may be taken to safeguard health, the attention of all concerned in fire tests is drawn to the possibility that toxic or harmful gases may be evolved during exposure of test specimens. The advice on safety given in clause 5 should also be followed.

1 Scope

This part of ISO 11925 specifies a test method for determining the ignitability by direct small flame impingement under zero impressed irradiance of building products used in a vertical orientation to assess the lowest level of performance.

This test method assesses the ignitability of products but not in a real fire situation and as such does not assess hazard. The test should be used simply as a method relating to the “primary” ignitability of materials.

NOTE Secondary ignition of materials in a growing fire situation can be addressed using ISO 5657 which assesses the ignitability of building products by thermal irradiance.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 11925. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 11925 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC Guide 52:1990, *Glossary of fire terms and definitions*.

ISO/TR 14697:—, *Reaction to fire tests — Guidance on the use of substrates*¹⁾.

3 Definitions

For the purpose of this part of ISO 11925, the definitions given in ISO/IEC Guide 52 and the following definitions apply.

3.1

constant mass

the state of a test specimen when two successive weighing operations carried out at an interval of 24 hours, do not differ by more than 0,1 % of the mass of the specimen or 0,1 g whichever is the greater

3.2

essentially flat product

a product having one of the following characteristics

- a) an essentially flat exposed surface;
- b) a surface irregularity that is evenly distributed over the exposed surface provided that
 - i) at least 50 % of the surface of a representative square area of 250 mm × 250 mm lies within a depth of 6 mm from a plane taken across the highest points on the exposed surface, or
 - ii) for a surface containing cracks, fissures or holes which do not exceed 6,5 mm in width nor 10 mm in depth, the total area of such cracks, fissures or holes at the surface does not exceed 30 % if a representative square area of 250 mm × 250 mm of the exposed surface.

¹⁾ To be published.

3.3 flame height

the distance from the upper edge of the burner to the yellow tip of the flame

3.4 flaming debris

matter flowing or separating from the specimen during the test procedure and falling below the initial lower edge of the specimen, continuing to flame as it falls, and igniting the cotton wadding

3.5 product

material, composite or assembly about which information is required

3.6 ignition

after withdrawal of the ignition source, the presence of a flame on the surface of the specimen

NOTE For the purposes of this part of ISO 11925, the definition of ignition given in ISO/IEC Guide 52 is insufficient.

4 Principle

Specimens are exposed to a small flame and their ignition behaviour is observed.

5 Safety requirements

There are hazards encountered when assessing the ignitability of any product using flame sources and it is essential that adequate precautions are taken. Particular attention should be paid to the handling of flammable gases, the evolution of potentially toxic gases, and the fact that extensive flaming of specimens may occur.

Adequate means of extinguishing the specimen should be provided, bearing in mind that some specimens may produce severe flaming during the test. A hand and/or fixed water spray which can be directed over the burning area should be available with other means, such as fire extinguishers and fire blankets.

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

6 Test specimens

6.1 Preparation

The test specimen can be cut from the product to be tested. The template specified in 7.8 may be used to facilitate this.

6.2 Dimensions

The dimensions of the specimens submitted for test shall be (340 ± 1) mm long by $(90 \pm 1,0)$ mm wide.

Specimens of nominal thickness 60 mm or less shall be tested using their full thickness. Specimens of nominal thickness greater than 60 mm shall be reduced to a thickness of 60 mm by cutting away the unexposed surface. If it is necessary to reduce the specimen size in this manner, do not expose the cut surface to the flame.

When the product is not essentially flat, the specimens may be tested in the form as in end use (e.g. pipe insulation). In such a case a modified specimen holder is required and this shall be described in the test report (see Annex A).

6.3 Number of specimens

6.3.1 Six specimens of the building product to be tested shall be submitted to test. Three specimens shall be cut lengthwise and three others crosswise. A further set of six specimens may be required to repeat the test (8.5.3).

6.3.2 For products more than 3 mm thick, a full preliminary set of additional specimens is required for carrying out tests to identify the least favourable point for flame impingement, if that point is exposed under end-use conditions, as specified in 8.2.2.2 and 8.2.2.3.

6.3.3 If a material under test is asymmetric through its thickness, and in practice either face may be exposed to a source of ignition, test a separate series of specimens on each face. Similarly, for materials which are chemically or physically not uniform in any other plane, test as many series of specimens as needed to represent the actual behaviour of the material when exposed to the ignition source.

6.3.4 Where a product has areas of its surface which are distinctly different, but each of these separate areas can satisfy the surface characteristics described in 3.2, then more than one test shall be conducted to fully evaluate the product.

6.3.5 If a material is installed with covered edges but may also be used with unprotected edges, tests should be performed on both covered and uncovered specimens.

6.4 Conditioning

Specimens of hygroscopic material shall be conditioned before test to constant mass at a temperature of (23 ± 2) °C and a relative humidity of (50 ± 5) % (see 3.1). These requirements correspond to the recommended atmosphere given in ISO 554.

Specimens of non-hygroscopic material shall be stored in this environment for at least 48 h prior to test.