

Implementation of ISO 5658-2:1996

Reaction to fire tests — Spread of flame —

Part 2: Lateral spread on building
products in vertical configuration

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- Association of Roof Light Manufacturers
- Autoclaved Aerated Concrete Products Association
- British Carpet Manufacturers Association Ltd.
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- Wood Panel Industries Federation
- Wood Wool Slab Manufacturers Association

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National foreword

This British Standard reproduces verbatim ISO 5658-2:1996 and implements it as the UK national standard.

This British Standard is published under the direction of the Consumer Products and Services Sector Board whose Technical Committee FSH/21 has the responsibility to:

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

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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
5658-2

First edition
1996-08-01

Reaction to fire tests — Spread of flame —

Part 2:

Lateral spread on building products in vertical
configuration

Essais de réaction au feu — Propagation du feu —

*Partie 2: Propagation latérale sur les produits de bâtiment en position
verticale*



Reference number
ISO 5658-2:1996(E)

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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.

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.

International Standard ISO 5658-2 was prepared by Technical Committee ISO/TC 92, *Fire safety*, Subcommittee SC 1, *Reaction to fire*.

ISO 5658 consists of the following parts, under the general title *Reaction to fire tests — Spread of flame*:

- *Part 1: Guidance on flame spread* (Technical Report);
- *Part 2: Lateral spread on building products in vertical configuration*;
- *Part 3: Lateral ignition and flame spread of building products in vertical configuration (LIFT) method* (Technical Report);
- *Part 4: Intermediate scale spread of flame*.

Annex A forms an integral part of this part of ISO 5658. Annexes B to F are for information only.

Introduction

This part of ISO 5658 is based on the method of the International Maritime Organization (IMO) published as IMO Resolution A.653(16)^[5], and has been developed as an International Standard in order to allow its wider use. The major differences between ISO 5658-2 and the IMO test are that ISO 5658-2 is limited in scope to testing the spread of flame over vertical specimens and does not include the stack for estimating heat release rate.

ISO/TR 5658-1 describes the development of standard tests for flame spread and explains the theory of flame spread for various orientations. The relationship, both theoretical and mathematical, which exists between ISO 5658-2 and ISO/TR 5658-3 is also explained.

ISO 5658-2 provides a simple method by which lateral surface spread of flame on a vertical specimen can be determined for comparative purposes. This method is particularly useful for research, development and quality control purposes.

ISO/TR 5658-3 provides a more scientific method by which the ignitability and spread of flame parameters of building products can be determined. The data derived from this test are suitable for use in fire growth (mathematical) models. The same test apparatus is used for the procedures specified in this part of ISO 5658 and ISO/TR 5658-3.

Fire is a complex phenomenon: its behaviour and its 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 to which they are exposed. The methodology of “reaction to fire” tests is explained in ISO/TR 3814^[1].

A test such as is specified in this part of ISO 5658 deals only with a simple representation of a particular aspect of the potential fire situation typified by a radiant heat source and flame; it cannot alone provide any direct guidance on behaviour or safety in fire.

A precision statement based on an interlaboratory trial using this test method is given in annex E.

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

The attention of all users of the test is drawn to the following caution.

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 annex A should also be noted.

1 Scope

1.1 This part of ISO 5658 specifies a method of test for measuring the lateral spread of flame along the surface of a specimen of a product orientated in the vertical position. It provides data suitable for comparing the performance of essentially flat materials, composites or assemblies, which are used primarily as the exposed surfaces of walls.

1.2 This part of ISO 5658 is applicable to the measurement and description of the properties of materials, products or assemblies in response to radiative heat in the presence of a pilot flame under controlled laboratory conditions. It should not be used alone to describe or appraise the fire hazard or fire risk of materials, products or assemblies under actual fire conditions.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 5658. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 5658 are encouraged to investigate the possibility of applying the most recent edition of the standard 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*.

3 Definitions

For the purposes of this part of ISO 5658, the definitions given in ISO/IEC Guide 52 and the following definitions apply.

3.1 assembly

fabrication of materials and/or composites, for example sandwich panels

NOTE 1 The assembly may include an air gap.

3.2 average heat for sustained burning

average of the values of heat for sustained burning, expressed in megajoules per square metre (MJ/m²), measured at a number of specified positions

3.3 backing board

non-combustible board with the same dimensions as the specimen, used in every test to back the specimen (see 9.7)

3.4**composite**

combination of materials which are generally recognized in building construction as discrete entities, for example coated or laminated materials

3.5**critical heat flux at extinguishment**

incident heat flux, expressed in kilowatts per square metre (kW/m^2), at the surface of a specimen at the point along its horizontal centreline where the flame ceases to advance and may subsequently go out. The heat flux value reported is based on interpolations of measurements with a non-combustible calibration board

3.6**exposed surface**

that surface of the specimen subjected to the heating conditions of the test

3.7**flame front**

furthest extent of travel of a sustained flame centrally along the length of the test specimen

3.8**flashing**

existence of flame on or over the surface of the specimen for periods of less than 1 s

3.9**heat for sustained burning**

product of the time from the start of exposure of a specimen to the arrival of the flame front at a specified position and the incident radiant heat flux corresponding to that position measured on a non-combustible calibration board. Expressed in megajoules per square metre (MJ/m^2)

NOTE 2 The positions are specified in Table 1 (see clause 10).

3.10**irradiance (at a point of a surface)**

quotient of the radiant heat flux incident on an infinitesimal element of surface containing the point, by area of that element

3.11**material**

single substance or uniformly dispersed mixture, for example metal, stone, timber, concrete, mineral fibre, polymers

3.12**product**

material, composite or assembly about which information is required

3.13**radiant heat flux**

power emitted, transferred or received in the form of radiation

3.14**specimen**

representative piece of the product which is to be tested together with any substrate or treatment

NOTE 3 The specimen may include an air gap.

3.15**spread of flame**

propagation of a flame front over the surface of a product under the influence of imposed irradiance

3.16**substrate**

material which is used, or is representative of that used, immediately beneath a surface product, e.g. skimmed plasterboard beneath a wall-covering

3.17**sustained flaming**

existence of flame on or over the surface of the specimen for periods of more than 4 s

3.18**transitory flaming**

existence of flame on or over the surface of the specimen for periods of between 1 s and 4 s

3.19**lateral spread of flame**

progression of the flame front in a lateral direction over the specimen length

4 Principles of the test

4.1 The test method consists of exposing conditioned specimens in a well-defined field of radiant heat flux and measuring the time of ignition, the lateral spread of flame, and its final extinguishment.

4.2 A test specimen is placed in a vertical position adjacent to a gas-fired radiant panel where it is exposed to a defined field of radiant heat flux. A pilot flame is sited close to, but usually not contacting, the hotter end of the specimen to ignite volatile gases issuing from the surface (see Figure 1).

4.3 Following ignition, any flame front which develops is noted and a record is made of the progression of the flame front horizontally along the length of the specimen in terms of the time it takes to travel various distances.