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Fire resistance tests — Door and shutter assemblies —

Part 4: Linear joint fire seal materials used to seal the gap between a fire door frame and the supporting construction

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 92, *Fire safety*, Subcommittee SC 2, *Fire containment.*

A list of all parts in the ISO 3008 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This fire test method provides a methodology for testing linear joint fire seal materials intended to be used to seal the 'linear joint gap' between a fire door frame and the supporting construction.

This test methodology is only appropriate for the evaluation of alternate linear joint fire seal materials used to seal the gap between a fire door frame and the supporting construction, if:

a) the fire door frame, doors and supporting construction have already been successfully tested according to ISO 3008-1 and the gap between the door frame and the supporting construction does not exceed 6 mm, provided the door and frame assembly does not permit the penetration of a gap gauge, as specified in ISO 834-1:1999, 8.4.2; or

b) the fire door frame, doors and supporting construction have already been successfully tested according to ISO 3008-1 and during the full-scale fire resistance test, deflection of the supporting construction and the fire door frame was found to be less than 100 mm.

Fire resistance tests — Door and shutter assemblies —

Part 4: Linear joint fire seal materials used to seal the gap between a fire door frame and the supporting construction

CAUTION — The attention of all persons concerned with managing and carrying out this fire-resistance test is drawn to the fact that fire testing can be hazardous and that there is a possibility of toxic and/or harmful smoke and gases evolving during the test. Mechanical and operational hazards can also arise during the construction of the test elements or structures, their testing and the disposal of test residues.

An assessment of all potential hazards and risks to health shall be made and safety precautions shall be identified and provided. Written safety instructions shall be issued. Appropriate training shall be given to relevant personnel. Laboratory personnel shall ensure that they follow written safety instructions at all times.

1 Scope

This document specifies a standard test methodology and resulting field of direct application which are applicable to linear joint fire seal materials used to seal around fire door sets which have been tested in accordance with ISO 3008-1.

The test methodology described in this document uses a smaller-scale fire resistance furnace than that prescribed in ISO 3008-1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 834-1, *Fire-resistance tests — Elements of building construction — Part 1: General requirements*

ISO 834-8, *Fire-resistance tests — Elements of building construction — Part 8: Specific requirements for non-loadbearing vertical separating elements*

ISO 3008-1, *Fire resistance tests — Door and shutter assemblies — Part 1: General requirements*

ISO 10295-1, *Fire tests for building elements and components — Fire testing of service installations — Part 1: Penetration seals*

ISO 10295-2, *Fire tests for building elements and components — Fire testing of service installations — Part 2: Linear joint (gap) seals*

ISO/TR 10295-3, *Fire tests for building elements and components — Fire testing of service installations — Part 3: Single component penetration seals — Guidance on the construction and use of test configurations and simulated services to characterise sealing materials*

ISO 13943, *Fire safety — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 834-1, ISO 834-8, ISO 3008-1, ISO 10295-1, ISO 10295-2, ISO 10295-3, ISO 13943 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
fire seal
seal designed to prevent the passage of fire or hot gases

[SOURCE: ISO/TR 10295-3:2012, 3.8, modified]

4 Test equipment

4.1 Reduced-scale furnace

The test equipment shall be as specified in ISO 834-1 and ISO 10295-1. A reduced-scale furnace may be used, provided the furnace is of sufficient size to accommodate a linear joint fire seal at least 900 mm in length. Guidance on the construction of reduced scale furnaces is provided in ISO 834-12.

In instances where the distance between anchors for the fire door frame exceeds 900 mm, the furnace used shall be of sufficient size to test a length of linear joint fire seal equivalent to the maximum distance between door frame anchors.

4.2 Furnace internal dimensions

The test furnace used for this test protocol shall have internal dimensions such that a distance of at least 200 mm exists between the side or long edge of a linear joint and the furnace boundary, subject to a minimum internal size of 1 m × 1 m × 1 m for horizontal (floor) furnaces.

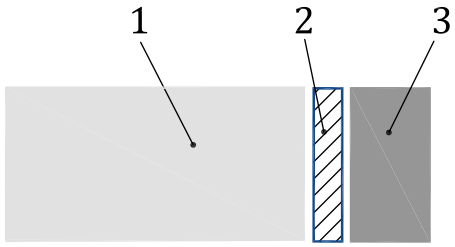
4.3 Vertical furnace dimensions

For vertical (wall) furnaces, the minimum internal size of the furnace shall be 1 m × 1 m and it shall be of sufficient depth to ensure that the temperature conditions specified in ISO 834-1 can be achieved, that the pressure conditions described in 6.2 can be achieved and that the test specimen is not subject to direct flame impingement at any time during the conduct of a test.

5 Test specimen

5.1 General

The specimen shall consist of a section of the supporting construction, the fire door frame and the linear gap seal. A typical sample installation on a reduced scale furnace is shown in Figure 1.



Key

1 supporting construction
2 linear joint fire stopping material
3 door frame

Figure 1 — Typical test sample configuration

5.2 Specimen size

Each test specimen shall be a minimum of 900 mm in length. In instances where the distance between anchors for the fire door frame exceeds 900 mm, the test specimen shall be of a length such that the combined length of linear joint fire seal, door frame and supporting construction is at least equivalent to the maximum distance between door frame anchors.

Both a vertical and horizontal specimen of the same linear joint seal design and adjacent fire door frame and supporting construction shall be tested in all cases. The vertical portion represents the fire door frame jamb and the horizontal portion represents the fire door frame header portion.

The maximum intended joint fire seal width shall be tested.

The minimum intended door frame section width shall be tested.

The width of supporting construction shall at least be 300 mm.

5.3 Specimen design

Any intended architrave materials shall be fitted over the linear joint seal and become an additional component of the seal. In this case the field of application is limited.

5.4 Timber door frame sections

The minimum intended timber density shall be tested.

Density and moisture measurements shall be taken prior to testing.

5.5 Splices

Where a splice within the seal material(s) and/or backing material(s) is present, in practice, this shall be included within the specimen. This splice shall be located 1/4 of the way down from the top of a vertical specimen and 1/4 of the way from the left-hand edge on a horizontal specimen.

5.6 Supporting construction

The supporting construction may be selected from the standard flexible and rigid supporting constructions specified in ISO 834-8 for the required time period.

Alternatively, a specific associated construction may be tested, but in this case, the field of application is limited to the specific construction only.

5.7 Packers and fixings

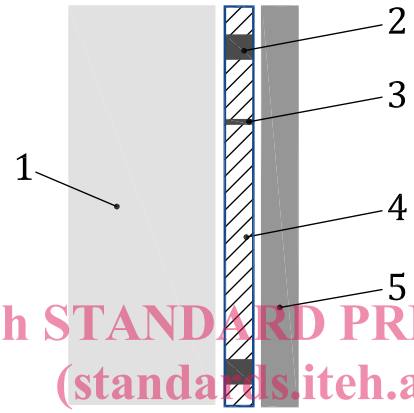
5.7.1 Packers

At present, this test methodology is only intended to evaluate the linear joint seal materials and not the packer and fixing materials. For this reason, the packer shall be of non-combustible material of maximum width of 50 mm × the required thickness, in order to set the linear joint seal gap width.

5.7.2 Fixings

Suitable steel fixings (e.g. screws) shall be used to fix the door frame section to the supporting construction wall to ensure the gap remains constant during the test.

See Figure 2 and Figure 3 for example test setups.



Key

1 supporting construction

2 packer

3 splice 1/4 down from top of seal (if applicable)

4 liner gap seal material tested at maximum required width

5 door frame at minimum density and section size required

NOTE Fire exposure is from right side of section as shown in the figure.

Figure 2 — Example vertical test set up with timber door frame section