INTERNATIONAL STANDARD

ISO 10295-2

First edition
2009-02-01

Fire tests for building elements and components — Fire testing of service installations —

Part 2: Linear joint (gap) seals

Essais au feu pour les éléments et composants de bâtiment — Essai au feu des installations de service —
Partie 2: Joints d'étanchéité pour interstices linéaires

Reference number
ISO 10295-2:2009(E)

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

Published in Switzerland

Contents

Page

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 10295-2 was prepared by Technical Committee ISO/TC 92, *Fire safety*, Subcommittee SC 2, *Fire containment*.

ISO 10295 consists of the following parts, under the general title *Fire tests for building elements and components — Fire testing of service installations*:

— *Part 1: Penetration seals*

— *Part 2: Linear joint (gap) seals*

A Part 3 dealing with guidance on the use of a test configuration to establish the direct and extended fields of application for single-component penetration seals is under development.

Introduction

This part of ISO 10295 describes test methods used to determine the fire resistive nature of joint seals when subjected to the standard fire-exposure conditions outlined in ISO 834-1. The test data generated by this International Standard permit the classification of these various joint seals based on their intended use and fire resistance under the specified acceptance criteria of this part of ISO 10295.

Joint seals are positioned in joints, voids, gaps or other discontinuities between or bounded by two or more supporting elements. Normally such openings are denoted as “linear” because the length is greater than the width, defined by a typical ratio of at least 10:1 as in practice. Joints are present in buildings as a result of

a) design to accommodate various movements induced by thermal differentials, seismic events and wind loads and exist as a clearance separation;

b) acceptable dimensional tolerances between two or more building elements, e.g. between non-load-bearing walls and floors;

c) inadequate design, inaccurate assembly, repairs or damage to the building.

This part of ISO 10295 describes methods of test for evaluating joint seals based on their intended use. This part of ISO 10295 also allows for the application of movement prior to and/or during fire testing.

This part of ISO 10295 provides the requirements for the test specimen, the test construction, the equipment (including any special apparatus or instrumentation), the procedures and acceptance criteria as they apply to joint seals and their supporting elements.

Fire tests for building elements and components — Fire testing of service installations —

Part 2:
Linear joint (gap) seals

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 that toxic and/or harmful smoke and gases can be evolved during the test. Mechanical and operational hazards can also arise during the construction of the test elements or structures, their testing and 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 part of ISO 10295 specifies the heating conditions, methods of test and criteria for the evaluation of the ability of a linear joint seal to maintain the fire integrity and thermal insulation of a fire-separating element at the joint being sealed. The purpose of the tests is to assess the integrity and insulation performance of the linear joint seals, including the effects of induced movement in those cases where the joint is designed to accommodate movement and has a width greater than 20 mm.

It is not the intention of this part of ISO 10295 to provide quantitative information on the rate of leakage of smoke and/or gases, or on the transmission or generation of fumes, although such phenomena can be recorded in describing the general behaviour of specimens during the test. It is not the intention of this part of ISO 10295 to evaluate joint seals where special test procedures already exist, e.g. doors, partitions, penetrations, pipes, ducts and cables.

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 834-1, *Fire-resistance tests — Elements of building construction — Part 1: General requirements*

ISO 13943, *Fire safety — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13943 and the following apply.

3.1
blockout
recess created in the supporting construction to allow the installation of the joint seal

NOTE It is typically not required on all joint seals.

3.2
fire-separating element
floor, wall or other separating element of construction having a period of fire resistance determined in accordance with ISO 834-1

3.3
joint
linear void having a length to width ratio of at least 10:1 between or within two juxtaposed elements

NOTE Typical locations of joints include floors, the perimeter of floors, walls, ceilings and roofs.

3.4
joint seal
system designed to maintain the fire-separating function and, where required, to accommodate a specified degree of movement

3.5
maximum joint width
widest opening an installed joint seal is intended to tolerate

NOTE It is stated by the manufacturer or test sponsor.

3.6
minimum joint width
narrowest opening an installed joint seal is intended to tolerate

NOTE It is stated by the manufacturer or test sponsor.

3.7
nominal joint width
specified opening of a joint in practice

NOTE It is selected by the manufacturer or test sponsor.

3.8
splice
connection or junction within the length of a joint seal

3.9
supporting construction
fire-separating elements into which joint seals are installed

3.10
termination
special design details applied at the ends of a joint seal

3.11
test construction
complete assembly of test specimens together with their supporting construction

3.12
test specimen
joint seal of specific materials, design and dimensions

3.13
transition
change in a direction in a joint seal, e.g. from horizontal to vertical in a wall construction, or through 90° at the perimeter of a floor slab

4 Symbols and abbreviated terms

For the purposes of this part of ISO 10295, the symbols and abbreviated terms given in ISO 834-1, together with the following, apply.

Table 1 — Symbol description

Symbol	Description
D_{sup}	Supporting element thickness
f	Deflection as function of the fire-resistance time
F_{mov}	Movement capability factor
l_1	Minimum furnace width
l_2	Thickness of supporting construction
l_3	Minimum 305 mm
l_4	Minimum 610 mm for horizontal supporting construction and 458 mm for vertical supporting construction
l_5	Minimum twice the thickness of supporting construction
W_{MAX}	Maximum joint width
W_{MIN}	Minimum joint width
W_{NOM}	Nominal joint width

5 Test equipment

5.1 Test equipment specified in ISO 834-1, which is applicable to all joint seals tested within the scope of this part of ISO 10295.

5.2 Test furnace, with 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.

For vertical (wall) furnaces, the minimum internal size of the furnace shall be 1 m × 1 m and 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.

5.3 Apparatus used for cycling of the test specimens prior to the fire test, capable of continuous and repetitive movement between two specified points that cycles the test specimen between the minimum and maximum joint widths, and be equipped with an automatic counter capable of displaying the number of completed cycles.

6 Test conditions

6.1 Heating conditions

The heating conditions shall conform to ISO 834-1.

6.2 Pressure

6.2.1 For vertical test constructions, the furnace shall be operated such that a minimum pressure of 20 Pa exists at the bottom of any test specimen.

6.2.2 In vertical elements, all splices shall be located within the positive pressure zone so that the pressure at the bottom of the splice is a minimum of 20 Pa for the lowest splice in the test construction.

6.2.3 For horizontal test constructions, the furnace shall be operated such that a minimum pressure of 20 Pa is established at a position (100 ± 10) mm below the lowest point of the test construction.

6.3 Load

Where applicable, a load shall be applied in accordance with the principles of ISO 834-1.

6.4 Movement

Where the seal is greater than 20 mm wide and is designed to accommodate movement, the joint shall be cycled prior to the test in accordance with Annex A using the information required in 7.8.4.

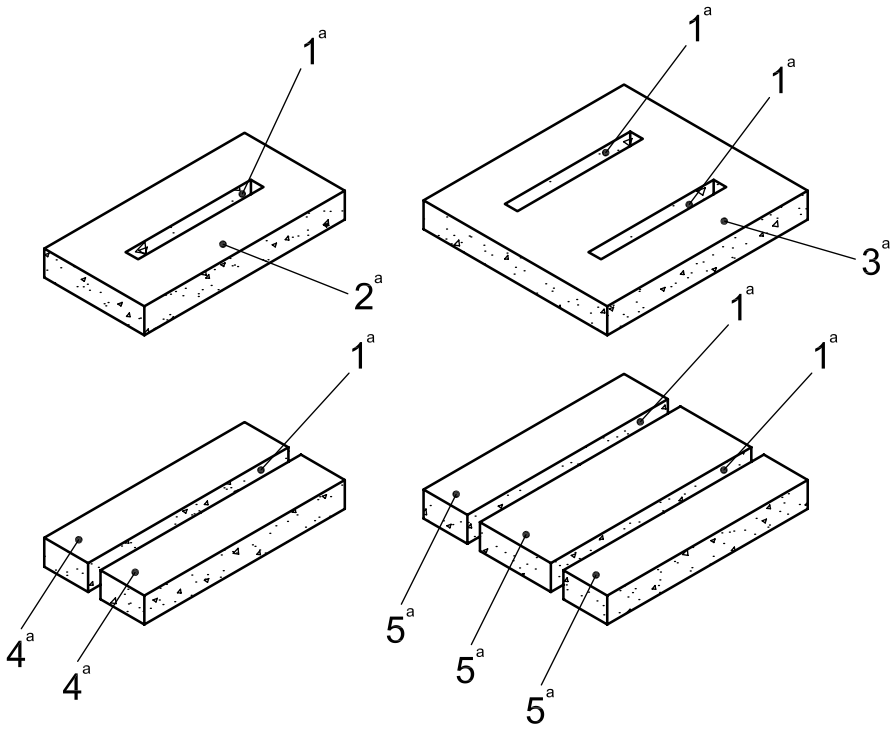
7 Specimen preparation

7.1 Supporting construction

The supporting construction shall be of known fire resistance and representative of that used in practice.

7.2 Test construction

7.2.1 For the purposes of tests, joints can be formed in slabs or by adjacent discrete members; see Figure 1.



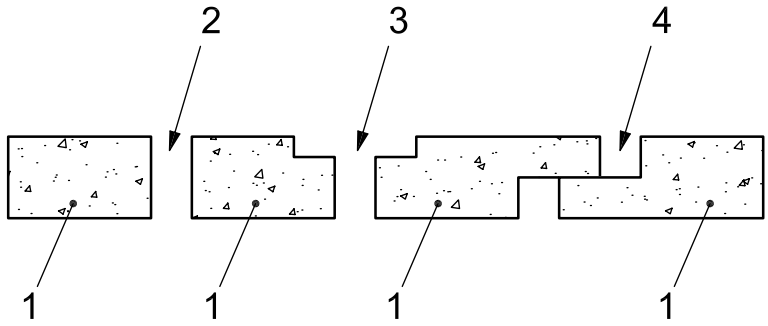
Key

1 linear joints
2 monolithic slab, single joint adjacent
3 monolithic slab, multiple joints adjacent
4 discrete members, single joint
5 discrete members, multiple joints

[a] Supporting constructions made of monolithic slabs may be used only for testing static joints.

Figure 1 — Supporting construction

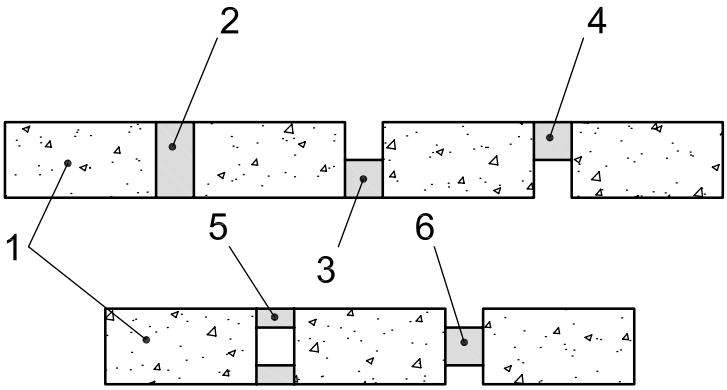
7.2.2 A test construction may consist of multiple variations in test-specimen widths, joint configurations, test-specimen configurations, joint-face positions and supporting elements of varying thickness, see Figures 2 and 3.



Key

1 supporting construction
2 linear joint (single-stage joint)
3 linear joint with blockouts
4 linear offset joint (multi-stage joint)

Figure 2 — Joint configuration



Key

1 supporting construction
2 test specimen fills joint
3 test specimen at bottom of joint
4 test specimen at top of joint
5 test specimen forms one or more air cavities
6 test specimen centred in joint

Figure 3 — Test-specimen orientation in joint

7.2.3 The minimum width of the supporting elements between joint edges shall be 200 mm or 2T, whichever is greater.

7.2.4 The minimum distance between a joint edge and an adjacent blockout edge shall be 200 mm or 2T, whichever is greater.