
**Fire resistance tests — Elements of
building construction —**

Part 12:

**Specific requirements for separating
elements evaluated on less than full
scale furnaces**

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Essais de résistance au feu — Éléments de construction —

*Partie 12: Exigences spécifiques pour éléments de séparation évalués
dans des fours de dimensions réduites*

ISO 834-12:2012

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Contents

	Page
Foreword.....	iv
Introduction.....	v
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 Symbols and abbreviated terms.....	2
5 Test equipment.....	2
5.1 Test furnace.....	3
6 Test conditions.....	3
7 Test specimen preparation.....	3
7.1 Design.....	3
7.2 Specimen size.....	3
7.3 Number of test specimens.....	3
7.4 Specimen conditioning.....	4
7.5 Specimen installation and restraint.....	4
8 Application of instrumentation.....	4
8.1 Furnace thermocouples (plate thermometer).....	4
8.2 Unexposed specimen thermocouples.....	5
8.3 Deflection measurement.....	5
8.4 Pressure.....	5
9 Test procedure.....	5
9.1 Furnace control.....	5
9.2 Measurements and observations.....	6
10 Performance criteria.....	6
11 Validity of the test.....	6
12 Expression of results.....	6
13 Test report.....	6
Annex A (informative) Direct application of results.....	7
Annex B (informative) Guidance for justification for smaller specimen size in less than full scale fire resistance furnace.....	8
Bibliography.....	9

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 834-12 was prepared by Technical Committee ISO/TC 92, *Fire safety*, Subcommittee SC 2, *Fire containment*.

ISO 834 consists of the following parts, under the general title *Fire resistance tests — Elements of building construction*:

- Part 1: *General requirements*
- Part 2: *Guidance on measuring uniformity of furnace exposure on test samples* [Technical Report]
- Part 3: *Commentary on test method and guide to the application of the outputs from the fire-resistance test* [Technical Report]
- Part 4: *Specific requirements for loadbearing vertical separating elements*
- Part 5: *Specific requirements for loadbearing horizontal separating elements*
- Part 6: *Specific requirements for beams*
- Part 7: *Specific requirements for columns*
- Part 8: *Specific requirements for non-loadbearing vertical separating elements*
- Part 9: *Specific requirements for non-loadbearing ceiling elements*
- Part 12: *Specific requirements for separating elements evaluated on less than full scale furnaces*

The following parts are under preparation:

- Part 10: *Specific requirements to determine the contribution of applied fire protection materials to structural elements*
- Part 11: *Specific requirements for the assessment of fire protection to structural steel elements*

Introduction

This part of ISO 834 contains specific requirements for fire resistance testing which are unique to the elements of construction described as separating non-loadbearing elements both horizontal and vertical. The requirements for these non-loadbearing elements are intended to be applied in appropriate conjunction with the detailed and general requirements contained in ISO 834-1.

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Fire resistance tests — Elements of building construction —

Part 12: Specific requirements for separating elements evaluated on less than full scale furnaces

1 Scope

This part of ISO 834 specifies the procedures to be followed for determining the fire resistance of non-load-bearing separating elements when exposed to heating on one face when the specimen size is such that a less than full scale fire resistance furnace is justified. This condition is particularly found in the testing of separating elements in transport applications since the end-use dimensions of the barrier products are often smaller than those specified in other parts of ISO 834. Specimen sizes requiring less than full size resistance furnaces are also found when testing elements to be fitted into a separating element, such as pipe penetration systems, ducts, dampers and cable transits.

The test is not appropriate for the evaluation of curtain walls (non-load-bearing external walls suspended from the ends of floor slabs) or walls containing doors or glazing. Tests of walls containing doors are covered by ISO 3008; tests of walls containing glazing are covered by ISO 3009.

The application of this test to other untested forms of construction is acceptable when the construction complies with the direct field of application as given in this part of ISO 834 or when it is subjected to a field of extended application analysis in accordance with ISO/TR 12470.

NOTE Since ISO/TR 12470 gives only general guidelines, specific extended application analyses are to be performed only by experts in fire resistant constructions.

Caution — Attention is drawn to the fact that fire testing may be hazardous and that there is a possibility that toxic and/or harmful smoke and gases may be evolved during the test. Mechanical and operational hazards may 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.

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 13943, *Fire tests — Vocabulary*

ISO 834-1, *Fire resistance tests — Elements of building construction — Part 1 — General requirements for fire resistance testing*

3 Terms and definitions

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

**3.1
separating elements**

building elements, such as walls, bulkheads or ceilings, which are required to act as fire separations or fire barriers; divide buildings (including ships, airplanes, trains, etc.) into fire compartments or fire zones; or separate a building from adjoining buildings, in order to resist the spread of fire to or from adjoining compartments or buildings

**3.2
non-loadbearing separating element**

separating element designed not to be subject to any load other than its self-weight

**3.3
internal non-loadbearing wall**

wall, which provides fire separation which may be exposed separately to a fire from either side

**3.4
external non-loadbearing wall**

wall forming the external envelope of a building which may be exposed separately to an internal or an external fire

**3.5
insulated non-loadbearing separating element**

separating element which satisfies both the integrity and insulation criteria for the anticipated fire resistance period

**3.6
standard supporting construction**

form of construction used to close off the furnace and to support the non-loadbearing separating element being evaluated and which has known resistance to thermal distortion

**3.7
plinth**

form of standard supporting construction that reduces the height of the opening by raising the support base to accommodate the test specimen

**3.8
uninsulated non-loadbearing separating element**

separating element which satisfies the integrity criteria for the anticipated uninsulated fire resistance period, but which is not required to meet the thermal insulating criterion contained in ISO 834-1

4 Symbols and abbreviated terms

Symbols and designations appropriate to this test are given in ISO 834-1.

5 Test equipment

Equipment employed in the conduct of this test consists of a furnace, restraint and support frames, and instrumentation as specified in ISO 834-1 and this part of ISO 834. The intent of this part of ISO 834 is to describe applicable furnaces to be used in evaluating test elements that are normally not used in dimensions that require the use of a full scale test furnace (as described in ISO 834-1, but that are capable of exposing the test specimen to similar heat regimes. Since applied loads do not scale well when the specimen sizes are reduced, this part of ISO 834 is for evaluating non-loadbearing specimens only.

NOTE Utilizing furnaces of less than full scale results in reduced testing fees and effort, while yielding similar test results. Potential applications include product development and extended applications. Take care when evaluating test results to be assured that the reduced furnace size did not influence the movement of test sample components resulting from thermal exposure such as adhesion of protective coatings and sheathing materials.

5.1 Test furnace

Test furnaces used in evaluating test elements of less than full scale dimensions shall be capable of maintaining any required pressure, temperature or restraining conditions as given in ISO 834-1.

Vertical furnaces and horizontal furnaces shall be capable of uniformly exposing the entire surface of a test specimen. Consequently, the furnace shall be at least as large as the width and height of the test element, with a minimum depth of 0,5m. Practice has shown that deeper furnaces are more uniform in their exposure.

6 Test conditions

The heating and pressure conditions and the furnace atmosphere shall conform to those given in ISO 834-1.

7 Test specimen preparation

7.1 Design

7.1.1 General

The test specimen shall be either:

- a) fully representative of the construction intended for use in practice, including any surface finishes and fittings which are essential and may influence its behaviour in the test, or
- b) designed to obtain the widest applicability of the test result to other similar constructions.

The design features which influence fire performance that should be included to give the widest application can be derived from the field of direct application.

The test specimen shall not contain mixtures of different types of construction, e.g. brick or blocks in a wall, unless this is fully representative of the construction in practice.

When separating elements incorporate services, such as electrical junction boxes or surface finishes, which are an integral part of the design of the element, these shall be included in the test specimen.

7.2 Specimen size

In some cases, in particular in transport media, actual dimensions of samples are smaller than the dimensions of the full scale furnace requirements of ISO 834-1. ISO 834-1 describes conditions under which these samples can be tested. Specimens should be evaluated at the largest dimensions for which they will be used in the field when these dimensions are smaller than specified in ISO 834-1. The specimen shall have a width of at least 1m, and a length or height of at least 1m.

7.3 Number of test specimens

For symmetrical constructions only one test specimen is required unless otherwise required by this part of ISO 834.

For asymmetrical constructions required to resist fire from either side, test specimens representative of the construction shall be subjected to fire exposure from each side unless it can be established that the fire exposure of a particular face would be more onerous.

Asymmetrical constructions required to resist fire from one specified side only shall be subjected to fire exposure from that side only.