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

Part 2:

**Guidance on measuring uniformity of
furnace exposure on test samples**

iTeh STANDARD PREVIEW
*Essais de résistance au feu — Éléments de construction —
Partie 2: Lignes directrices pour la mesure de l'uniformité de l'exposition
au feu des échantillons pour essai*

ISO/TR 834-2:2009

<https://standards.iteh.ai/catalog/standards/sist/baa4bb11-7009-47f9-9757-9d5cab3b742e/iso-tr-834-2-2009>



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/TR 834-2:2009](#)

<https://standards.iteh.ai/catalog/standards/sist/baa4bb11-7009-47f9-9757-9d5cab3b742e/iso-tr-834-2-2009>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2009

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

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	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Test equipment	1
5 Test method	11
6 Report	12
Annex A (informative) Commentary	13
Bibliography	14

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/TR 834-2:2009](https://standards.iteh.ai/catalog/standards/sist/baa4bb11-7009-47f9-9757-9d5cab3b742e/iso-tr-834-2-2009)

<https://standards.iteh.ai/catalog/standards/sist/baa4bb11-7009-47f9-9757-9d5cab3b742e/iso-tr-834-2-2009>

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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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

<https://standards.iteh.ai/catalog/standards/sist/baa4bb11-7009-47f9-9757-9d5eb3b742e/iso-tr-834-2-2009>

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 test data application* [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*

Introduction

The purpose of this Technical Report is to recommend a procedure to measure the exposure of a test sample to a furnace during a test conducted in accordance with ISO 834 (all parts). The furnace exposure is determined by measuring temperature, air velocity and oxygen concentration at various locations. The recommended procedure includes the use of low-cost, readily available, lightweight materials to represent the test sample. The recommended materials minimize the influence of variable moisture content among samples.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO/TR 834-2:2009](https://standards.iteh.ai/catalog/standards/sist/baa4bb11-7009-47f9-9757-9d5cab3b742e/iso-tr-834-2-2009)

<https://standards.iteh.ai/catalog/standards/sist/baa4bb11-7009-47f9-9757-9d5cab3b742e/iso-tr-834-2-2009>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/TR 834-2:2009

<https://standards.iteh.ai/catalog/standards/sist/baa4bb11-7009-47f9-9757-9d5cab3b742e/iso-tr-834-2-2009>

Fire-resistance tests — Elements of building construction —

Part 2:

Guidance on measuring uniformity of furnace exposure on test samples

1 Scope

This Technical Report establishes general principles for measuring the uniformity of furnace exposure of samples tested in accordance with the requirements of ISO 834-1. This Technical Report specifies the type and location of instrumentation used to measure the temperature, velocity and oxygen content near the surface of simulated test samples. The surface of the simulated sample facing the furnace is gypsum board secured to cold-formed steel supports.

This Technical Report does not include requirements for furnace performance.

iTeh STANDARD PREVIEW

2 Normative references (standards.iteh.ai)

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*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

effective area of furnace opening

furnace opening within the boundaries of the monitoring instrumentation

4 Test equipment

4.1 Supporting construction

4.1.1 The supporting construction shall consist of cold-formed steel supports faced with two layers of gypsum board a minimum of 16 mm thick intended for use in fire-barrier assemblies on the side facing the furnace and with a single-layer structural panel a minimum of 18 mm thick on the side facing away from the furnace.

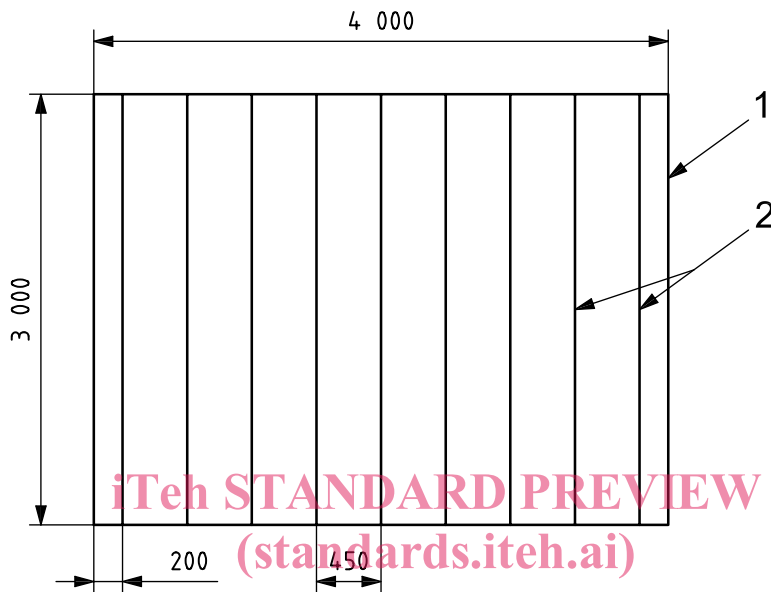
NOTE 1 Gypsum boards used in fire barrier assemblies are identified as Type X by ASTM C1396 and as Type F by EN 520.

NOTE 2 Plywood and oriented strand boards are considered typical structural panels.

4.1.2 Construction details with respect to the location of the support channels, gypsum board and the structural panels are shown in Figures 1 through 6. Figures 1 through 3 apply to horizontal supporting constructions. Figures 4 through 6 apply to vertical supporting constructions.

4.1.2.1 The construction details assume a horizontal furnace opening of 3 m by 4 m and a vertical furnace opening of 3 m by 3 m. Modifications to dimensions are necessary for other furnace opening dimensions.

Dimensions in millimetres

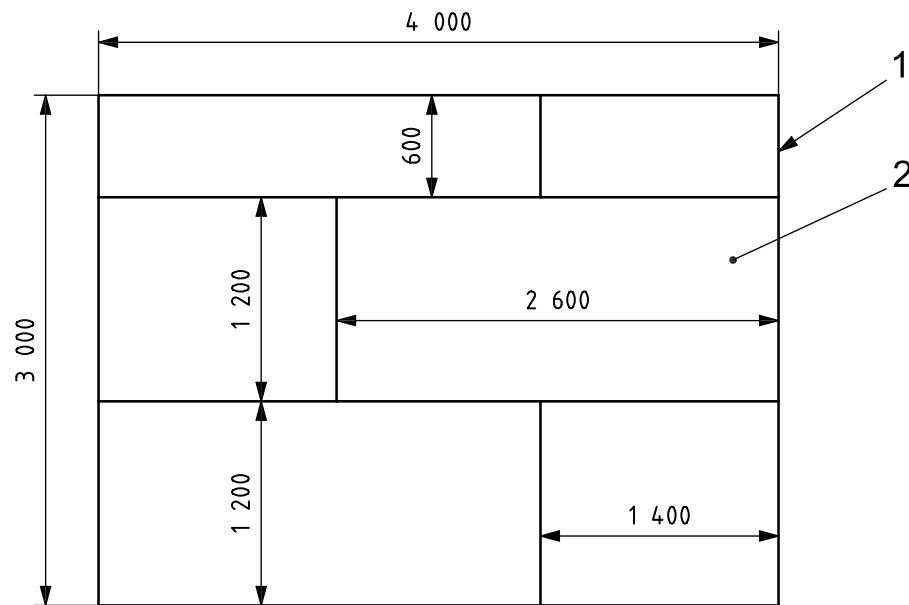


Key

- 1 perimeter of supporting construction
- 2 support channels, nine, spaced 450 mm on centre

Figure 1 — Details of horizontal supporting construction —
Layout of support channels

Dimensions in millimetres



Key

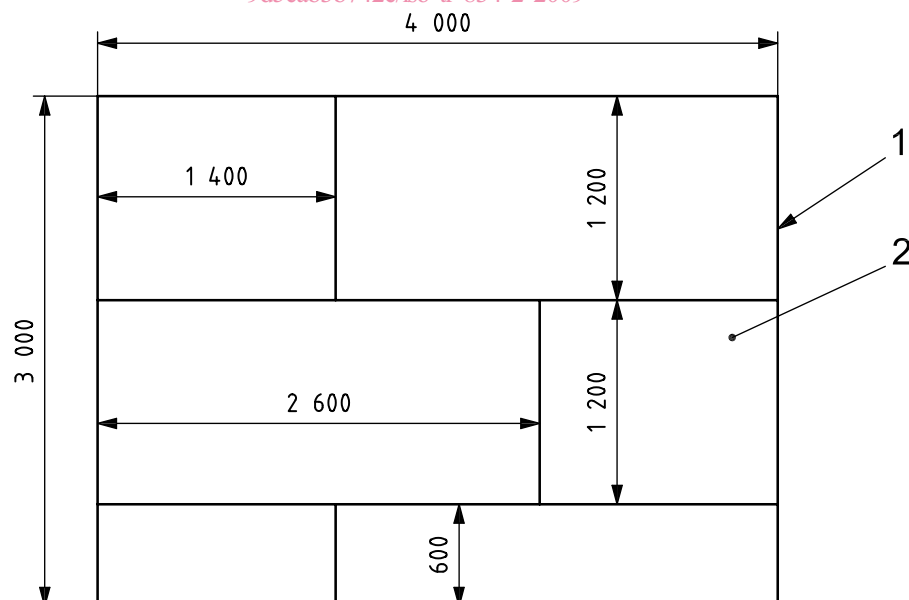
- 1 perimeter of supporting construction
- 2 inner (first) layer of gypsum board or structural panels on unexposed surface

**Figure 2 — Details of horizontal supporting construction —
Layout of inner layer of gypsum board and structural panels**

ISO/TR 834-2:2009

<https://standards.iteh.ai/catalog/standards/sist/baa4bb11-7009-47f9-9757-9d5cab3b742e/iso-tr-834-2-2009>

Dimensions in millimetres

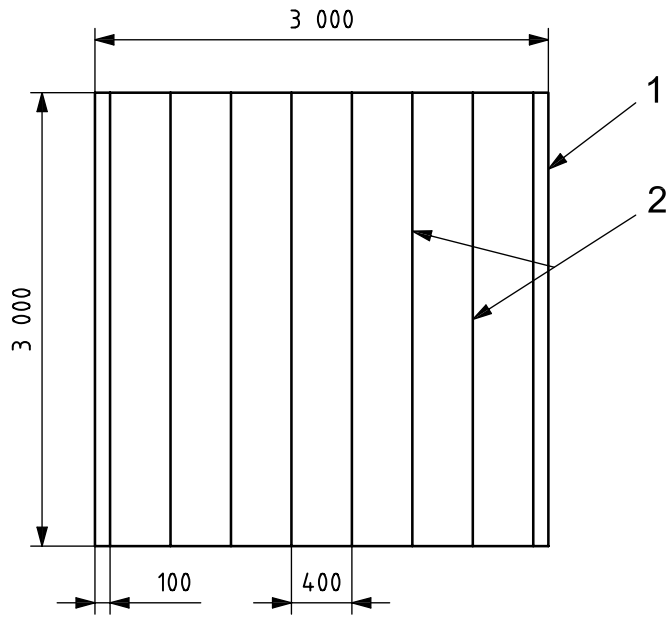


Key

- 1 perimeter of supporting construction
- 2 outer (second) layer of gypsum board

**Figure 3 — Details of horizontal supporting construction —
Layout of outer layer of gypsum board**

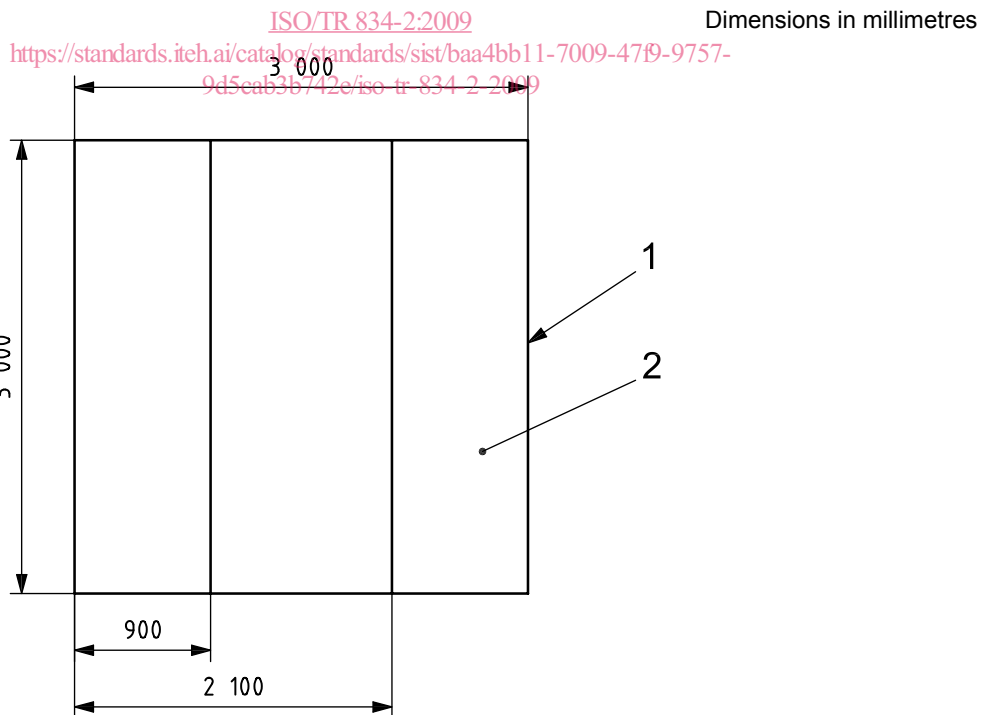
Dimensions in millimetres



Key

- 1 perimeter of supporting construction
- 2 support channels, eight, spaced 400 mm on centre

**Figure 4 — Details of vertical supporting construction —
Layout of support channels**

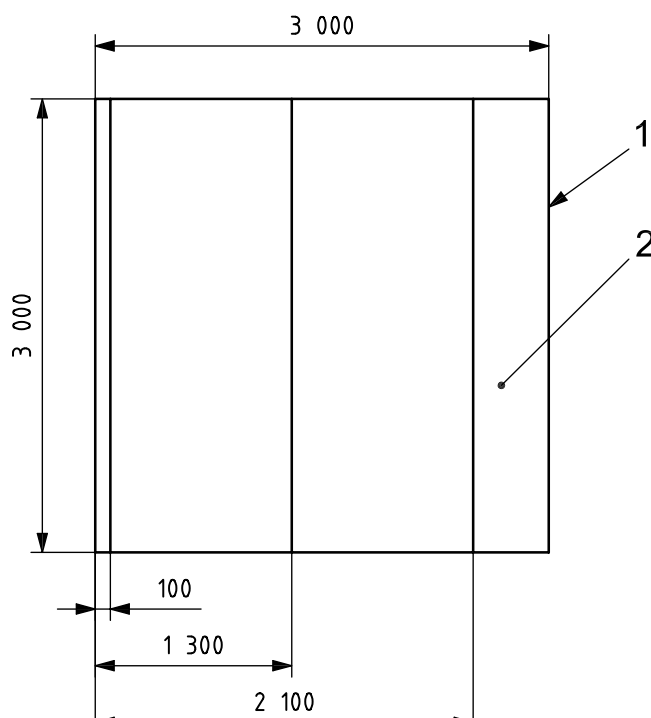


Key

- 1 perimeter of supporting construction
- 2 inner (first) layer of gypsum board or structural panels on unexposed surface

**Figure 5 — Details of vertical supporting construction —
Layout of inner layer of gypsum board and structural panels**

Dimensions in millimetres



iTeh STANDARD PREVIEW
(standards.iteh.ai)

Key

- 1 perimeter of supporting construction
- 2 outer layer of gypsum board

ISO/TR 834-2:2009

Figure 6 — Details of vertical supporting construction —
Layout of outer layer of gypsum board

4.1.3 The cold-formed steel support channels for horizontal supporting construction shall be fabricated from steel a minimum 1,4 mm thick. The channels shall be C-shaped with a minimum depth of 240 mm, a minimum flange width of 40 mm and a minimum return flange of 12 mm.

The horizontal support channels shall be attached to rim channels. Rim channels are located along the perimeter of the horizontal supporting construction and run perpendicular to the direction of the support channels. The dimensions of the rim channels shall be compatible with the support channels. The support channels shall be attached to the rim channels with steel screws.

NOTE Attachment of the support channel to the rim channel can require the use of a steel clip angle.

4.1.4 The cold-formed steel support channels for vertical supporting construction shall be fabricated from steel a minimum of 0,9 mm thick. The channels shall be C-shaped with a minimum depth of 90 mm, a minimum flange width of 30 mm and a minimum return flange of 5 mm.

The vertical support channels shall be attached to rim channels. The rim channels are located along the top and bottom of the vertical supporting construction. The dimensions of the rim channels shall be compatible with the support channels. The support channels shall be attached to the rim channels with steel screws.

NOTE Attachment of the support channel to the rim channel can require the use of a steel clip angle.

4.1.5 The support channels shall be spaced 300 mm to 450 mm on centre.