
**Fire-resistance tests — Guidance
on the application and extension
of results from tests conducted on
fire containment assemblies and
products —**

**Part 1:
Loadbearing elements and vertical
and horizontal separating elements**

*Essais de résistance au feu — Recommandations pour l'application
et l'extrapolation des résultats d'essais réalisés sur les produits et
assemblages d'endiguement du feu —*

*Partie 1: Éléments porteurs et éléments horizontaux et verticaux de
séparation*



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Foreword

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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).

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For an explanation on 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 the following URL: 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 12470 series can be found on the ISO website.

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Introduction

Fire resistance tests on building components are necessary to establish their behaviour against pre-determined criteria when exposed to a representative fully developed fire and to provide information that may be used in determining the fire safety of buildings. For several decades, people have accepted, by means of test results only, the possibility of grading the components. Now, due to the enhancement of our knowledge and the complexity of buildings, it is necessary to be able to give a more accurate assessment of the components used in buildings, particularly with the growth of the use of functional approaches to designing fire safe structures.

The need to understand how the element will perform at a different size, with different levels of restraint, etc. is vital when applying the results of the fire tests in a life safety situation, especially those where the fire safe solution has been generated using fire safety engineering techniques rather than using a code compliant solution. This does not negate the need to predict any changes that may result from changes to the test construction when complying with building code solutions, but these codes may themselves provide solutions that take into account the influence or impact of changes, and indeed the guidance given in this document may be used by the code writers to produce such guidance.

Even with the knowledge available to assess the behaviour of a given constructional element, whatever its design or its size, we will still be some distance away from establishing the complete behaviour of a building in a real fire.

The philosophy of only grading elements into different fire resistance categories may not give any indication about how the element actually behaves when heated. By studying and analysing the data from fire resistance tests, it will be possible, using the guidance within this document, to obtain a basic understanding of the influence of the main parameters on the element performance during fire resistance tests.

In practice, tests do give much useful information which can be used for interpolation and extrapolation of the results.

The original version of ISO/TR 12470 was published by ISO/TC 92/SC 2 in 1998. This Technical Report provided a methodology identifying how the results of fire resistance tests carried out in the standard furnaces could be modified to apply to the elements as they may be used in practice. In some cases, the results of the test may need to be reduced to reflect any increases in the degree of difficulty that the final application represents or alternatively, modifications/enhancements may need to be made to the construction in order to maintain the performance level(s).

In the intervening years since the original Technical Report was prepared, a greater understanding has developed as to what the changes are likely to be and how they may be quantified. Some of the work in Comité Européen de Normalisation (CEN) has aided this process and in particular, the principles given in [Annex A](#) remained unpublished by CEN but were developed in one of the technical Work Groups of CEN/TC 127. This revision represents the current state-of-art in respect of the objectives of the original 1998 version of ISO/TR 12470.

In this document, all assessments of extended application are based on standard time/temperature conditions and on isolated elements, with no interaction with the adjacent elements.

Also, ageing and weathering are not covered.

The ISO/TR 12470 series is published in two parts:

Part 1: Loadbearing elements and vertical and horizontal separating elements;

Part 2: Fire resistant door assemblies, glazing, services and service penetration.