
**Fire safety engineering — Guidance on
fire risk assessment**

*Ingénierie de la sécurité contre l'incendie — Lignes directrices pour
l'évaluation du risque d'incendie*



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Contents

Page

Foreword.....	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Applicability of fire risk assessment	6
4.1 Circumstances where fire risk assessment is useful	6
4.2 Circumstances where fire risk assessment is essential	6
5 Overview of fire risk management	6
6 Steps in fire risk estimation	7
6.1 Overview of fire risk estimation	7
6.2 Use of scenarios in fire risk assessment	9
6.3 Characterization of probability	11
6.4 Characterization of consequence	13
6.5 Calculation of scenario fire risk and combined fire risk	14
7 Uncertainty, sensitivity, precision and bias	16
7.1 Elements of uncertainty analysis	16
8 Fire risk evaluation	17
8.1 Individual and societal risk	17
8.2 Risk acceptance criteria	17
8.3 Safety factors and safety margins	18
Annex A (informative) Additional definitions	20
Bibliography	22

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 other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;
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An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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/TS 16732 was prepared by Technical Committee ISO/TC 92, *Fire safety*, Subcommittee SC 4, *Fire safety engineering*.

Introduction

This Technical Specification is for use by fire safety practitioners who employ risk assessment based methods. Examples include fire safety engineers; authorities having jurisdiction, such as territorial authority officials; fire service personnel; code enforcers; code developers; insurers; fire safety managers; and risk managers. Users of this Technical Specification are to be appropriately qualified and competent in the fields of fire safety engineering and risk assessment. It is particularly important that the user understand the limitations of application of any methodology that is used.

Risk assessment is preceded by two steps: establishment of a context, including the fire safety objectives to be met, the subjects of the fire risk assessment to be performed and related facts or assumptions; and identification of the various hazards to be assessed.

The subjects of fire risk assessment include the design and control of any part of the built environment, such as buildings or other structures. Fire risk assessment of a design consists of analysis of the risks, e.g. frequency and severity of harm, that are predicted to result if the design is implemented, combined with an evaluation of the acceptability of those risks.

Fire risk assessment can be used to support any decisions about fire prevention or fire protection of new or existing built environments, such as buildings, where probabilistic aspects, such as fire ignition or the reliability of fire precautions, are important. Fire risk assessment also can be used to establish safety equivalent to a code, to assess the balance between cost and risk, or to examine acceptable risk specifically for severe events. Fire risk assessment also can be used to provide general guidance or to support choices in the selection of scenarios and other elements of a deterministic analysis.

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Fire safety engineering — Guidance on fire risk assessment

1 Scope

This Technical Specification provides the conceptual basis for fire risk assessment by stating the principles underlying the quantification and interpretation of fire-related risk. These fire risk principles apply to all fire-related phenomena and all end-use configurations, which means these principles can be applied to all types of fire scenarios.

This Technical Specification is designed as a guide for future documents that provide formal procedures for the implementation of the risk assessment principles for specific applications, e.g. situations in which only certain types of fire scenarios are possible. Those future documents will complete the process of full standardization begun by this Technical Specification, which not only specifies the steps to be followed in fire risk assessment but also provides guidance for use in determining whether the specific approach used for quantification falls within an acceptable range.

Principles underlying the quantification of risk are presented in this Technical Specification in terms of the steps to be taken in conducting a fire risk assessment. These quantification steps are initially placed in the context of the overall management of fire risk and then explained within the context of fire safety engineering, as discussed in ISO/TR 13387. The use of scenarios and the characterization of probability and consequence are then described as steps in fire risk estimation, leading to the quantification of combined fire risk. Guidance is also provided on the use of the information generated, i.e. on the interpretation of fire risk. Finally, there is an examination of uncertainty in the quantification and interpretation of the fire risk estimates obtained, following the procedures in this document.

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 921:1997, *Nuclear energy — Vocabulary*

ISO 2394:1998, *General principles on reliability for structures*

ISO/TR 13387 (all parts), *Fire safety engineering*

ISO 13943:2000, *Fire safety — Vocabulary*