
**Life-threatening components of fire —
Part 2:
Methodology and examples of
tenability assessment**

Composants dangereux du feu —

Partie 2: Méthodologie et exemples d'analyse de tenabilité





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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.

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 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.

The committee responsible for this document is ISO/TC 92 *Fire Safety*, Subcommittee 3, *Fire threat to people and environment*.

Introduction

Tenability of people in case of fire is an essential safety objective of regulations. Reasons that could lead to compromised tenability conditions are loss of visibility, thermal and toxic effects. ISO 13571 is a tool that has been developed to quantify the performance level related to these criteria in case of a fire.

This document presents application cases of ISO 13571. It is structured as follows:

- [Clause 4](#) explains the principle of the application;
- [Clause 5](#) presents the selection of performance criteria;
- [Clause 6](#) presents the evaluation of the impact of fire to people according to ISO 13571;
- [Clause 7](#) introduces the examples detailed in [Annexes A, B, D](#) and [E](#).

Examples of application are presented in annexes. The first case of application concerns comparison of tenability in real-scale fire tests ([Annex A](#) and [Annex B](#)). The second case presents the methodology ([Annex C](#)) and two example cases ([Annex D](#) and [Annex E](#)) for application of ISO 13571 as performance criteria in Fire Safety Engineering studies according to ISO 23932. [Annex F](#) presents information on experimental production of input data.

Life-threatening components of fire —

Part 2: Methodology and examples of tenability assessment

1 Scope

This document describes the practical application of ISO 13571 as a tool to evaluate effects of fire effluents on people. The method of application, performance criteria and evaluation of the impact are explained and illustrated by two families of examples: application to real-scale tests ([Annex A](#) and [Annex B](#)) and application to Fire Safety Engineering ([Annex C](#), [D](#) and [E](#)).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13943 and ISO 13571 apply. ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Principle

Smoke toxicity, to a certain degree, is not a material property. Depending on the environment, availability of oxygen, thermal attack, flow conditions and surface areas available for combustion, the chemistry of the combustion of a given material can proceed along various routes and produce species in very different quantities.^{[1][2][3]} It is then a systemic parameter, which needs a systemic approach, as stated in ISO 19706.

It is also appropriate to keep the following points in mind:

- The production rates of various gaseous species change according to the combustion regime. In particular the influential parameters (not exhaustive) are:
 - Fuel nature
 - Oxygen availability
 - Temperature