



Technical Report

ISO/TR 22099

Application examples for using reaction-to-fire test data for fire safety engineering

*Exemples d'applications de l'utilisation des données des essais de
réaction au feu pour l'ingénierie de la sécurité incendie*

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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms, definitions and abbreviated terms	1
3.1 Abbreviated terms	1
4 Example 1: Using mass loss data for a single burning item as input for computational fluid dynamics (CFD) calculations	1
4.1 Introduction	1
4.2 Experimental investigations	1
4.3 Numerical investigations	4
4.4 Discussion of the results	7
4.5 Conclusions	8
5 Example 2: Using cone calorimeter and LIFT apparatus data as input for flame spread calculations	9
5.1 Reaction to fire tests for flame spread calculations	9
5.1.1 Overview	9
5.1.2 Cone calorimeter tests	9
5.1.3 Lateral ignition and flame transport (LIFT) test	10
5.2 Methods to derive material properties for flame spread	11
5.2.1 Parameters calculated from cone calorimeter tests	11
5.2.2 Parameters measured by LIFT tests	17
5.3 An example of derivation of properties	19
5.3.1 Specimen	19
5.3.2 Properties derived from Cone calorimeter tests ^[19]	19
5.3.3 Properties derived from LIFT tests	22
5.4 Prediction of flame spread over lining materials	25
5.4.1 Overview	25
5.4.2 Schematics of model	25
5.4.3 Ignition of wall surface	26
5.4.4 Heat release rate	27
5.4.5 Upward flame spread	27
5.4.6 Lateral and downward flame spread	28
5.4.7 Smoke layer temperature	28
5.4.8 Calculation procedure	28
5.5 Comparison with an experiment	28
5.5.1 Experimental conditions and procedure	28
5.5.2 Experimental results	30
5.5.3 Calculation conditions	32
5.5.4 Calculation results	33
5.6 Summary of example 2	35
6 Example 3: Using mass loss data for a single burning item as input for zone model calculations including fuel response effects	35
6.1 General	35
6.2 Experimental investigations	36
6.3 Numerical investigations	37
6.4 Discussion of the results	37
Bibliography	41

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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This document was prepared by Technical Committee ISO/TC 92, *Fire safety*, Subcommittee SC 1, *Fire initiation and growth*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

In recent years, fire test data has been increasingly used as input for fire safety engineering (FSE) calculations. This document provides three different examples of how fire test data can be used for FSE. Guidance on how data can be derived from reaction-to-fire tests is given in ISO/TR 17252. Background on reaction-to-fire tests and limitations of data derived from these tests is given in ISO/TS 3814.

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Application examples for using reaction-to-fire test data for fire safety engineering

1 Scope

This document provides three examples of the use of reaction-to-fire test data for fire safety engineering (FSE).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 safety — Vocabulary*

3 Terms, definitions and abbreviated terms

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

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

3.1 Abbreviated terms

CFD computational fluid dynamics

FSE fire safety engineering

LIFT lateral ignition and flame transport

MLR mass loss rate

4 Example 1: Using mass loss data for a single burning item as input for computational fluid dynamics (CFD) calculations

4.1 Introduction

The use of data from open calorimetry or mass loss measurements for a single burning item is used in FSE to predict, for example, the temperature development, smoke development or the further spread of fire.

This example provides insight in the use of mass loss data for CFD calculations and its limitations.

4.2 Experimental investigations

Three tests with a modern upholstered chair were performed, see [Table 1](#). In all three experiments, the modern upholstered chair was ignited with a 100-gr paper cushion which was made similar to the standard train seat ignition source (according to DIN 5510).