PD ISO/TR 24679-5:2023



BSI Standards Publication

Fire safety engineering — Performance of structures in fire

Part 5: Example of a timber building in Canada

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee FSH/24, Fire safety engineering.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Published by BSI Standards Limited 2023

ISBN 978 0 539 04534 5

ICS 13.220.01

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 July 2023.

Amendments/corrigenda issued since publication

Date	Text affected

PD ISO/TR 24679-5:2023

TECHNICAL REPORT

ISO/TR 24679-5

First edition
2023-07-18

Fire safety engineering — Performance of structures in fire —

Part 5: Example of a timber building in Canada

Reference number
ISO/TR 24679-5:2023(E)

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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 document 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 4, *Fire safety engineering*.

A list of all parts in the ISO 24679 series can be found on the ISO website.

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

This document provides an example of the application of ISO 24679-1. The procedure described in this document is intended to follow the principles outlined in ISO 24679-1. It therefore preserves the numbering of subclauses in ISO 24679-1, omitting numbered subclauses for which there is no text or information relevant to this example.

The example provided in this document is intended to illustrate the implementation of the steps of fire resistance assessment, as defined in ISO 24679-1, and to demonstrate how ISO 24679-1 can be applied to different building regulatory systems. It is not intended to demonstrate full conformance of a performance-based fire engineering design seeking approval. Therefore, only a limited number of fire design scenarios and structural assessments are presented.

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TECHNICAL REPORT **ISO/TR 24679-5:2023**

Fire safety engineering — Performance of structures in fire —

Part 5: Example of a timber building in Canada

1 Scope

This document provides a fire engineering application relative to the fire resistance assessment of a multi-storey timber building according to the methodology given in ISO 24679-1. In an attempt to facilitate the understanding of the design process presented herein, this document follows the same step-by-step procedure as that given in ISO 24679-1.

The fire safety engineering approach is applied to a multi-storey timber building with respect to fire resistance and considers specific design fire scenarios, which impact the fire resistance of structural members.

A component-level (member analysis) approach to fire performance analysis is adopted in this worked example. Such an approach generally provides a more conservative design than a system-level (global structural) analysis or an analysis of parts of the structure where interaction between components can be assessed. An advantage of the component-level approach is that calculations can be done with the use of simple analytical models or spreadsheets. Advanced modelling using computational fluid dynamics is presented to replicate an actual office cubicle fire scenario and for assessing timber contribution to fire growth, intensity and duration, if any. The thermo-structural behaviour of the timber elements is assessed through advanced modelling using the finite element method.

The fire design scenarios chosen in this document are only used for the evaluation of the structural fire resistance. They are not applicable for assessing, for example, smoke production, tenability conditions or other life safety conditions.

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*

ISO 23932-1, *Fire safety engineering — General principles — Part 1: General*

ISO 24679-1, *Fire safety engineering — Performance of structures in fire — Part 1: General*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13943, ISO 23932-1 and ISO 24679-1apply.

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/

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