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STN	**Požiarnobezpečnostné inžinierstvo Požiadavky na algebraické vzorce Časť 2: Požiarny kúdol (fire plume)**	**STN ISO 24678-2** 92 0113

Fire safety engineering
Requirements governing algebraic formulae
Part 2: Fire plume

Ingénierie de la sécurité incendie
Exigences régissant les formules algébriques
Partie 2: Panaches de feu

Táto slovenská technická norma obsahuje anglickú verziu medzinárodnej normy ISO 24678-2: 2022 a má postavenie oficiálnej verzie.

This Slovak standard includes the English version of the International standard ISO 24678-2: 2022 and has the status of the official version.

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Anotácia

Tento dokument určuje (špecifikuje) požiadavky na aplikáciu sústav podrobných (explicitných) algebraických vzorcov na výpočet určených (špecifických) charakteristík požiarneho kúdolu.

Národný predhovor

Dokumenty týkajúce sa požiarnobezpečnostného inžinierstva sú na medzinárodnej úrovni spracovávané v subkomisii ISO/TC 92/SC 4 Požiarnobezpečnostné inžinierstvo a v európskej pracovnej skupine CEN/TC 127 WG 8 Požiarnobezpečnostné inžinierstvo – angl. Fire safety engineering (ďalej len „FSE“).

Požiarnobezpečnostné inžinierstvo je určené pre nové inovatívne výrobky, návrhy a projekty a prevádzku, kde nie sú určené požiadavky požiarnej bezpečnosti stavieb.

Požiarnobezpečnostné inžinierstvo je alternatívou predpisových (právnych a normatívnych) riešení. Je zapracované v mnohých európskych a medzinárodných normách a normatívnych dokumentoch, (napr. časti eurokódov, týkajúcich sa účinkov požiaru) prijatých do sústavy STN a pokynov EÚ na požiar.

Požiarnobezpečnostné inžinierstvo sa používa v súlade s zákonom č. 314/2000 Z. z. o ochrane pred požiarmi. Národné predpisy a normy umožňujú ich používanie za špecificky určených podmienok.

Požiarnobezpečnostné inžinierstvo ako podrobné alternatívne riešenie je možné používať na návrh komplexných alebo čiastkových problémov požiarnobezpečnostného inžinierstva.

Pre správne používanie je nevyhnutná znalosť najnovších základných dokumentov FSE a spracovanie požiarnymi inžiniermi – požiarnymi expertmi.

Tieto dokumenty FSE sú určené pre vedeckých pracovníkov, technické inžinierske vzdelávanie, architektov a stavebných inžinierov, účastníkov stavebného procesu, schvaľujúce orgány a manažment prevádzok budov a inžinierskych diel.

Požiarny kúdol (fire plume) sa nad rozvíjajúcim požiarom začína tvoriť od samého počiatku. V prípade, že nie je ovplyvnený okolitými vplyvmi (napr. prúdením vzdušniny, stavebnými konštrukciami), vytvára tvar obráteného kužeľa.

Fire plume je možné rozdeliť na tri zóny, a to:

- zónu plameňa;
- prechodovú zónu;
- zónu dymu.

Normatívne referenčné dokumenty

Nasledujúce dokumenty, celé alebo ich časti, sú v tomto dokumente normatívnymi odkazmi a sú nevyhnutné pri jeho používaní. Pri datovaných odkazoch sa použije len citované vydanie. Pri nedatovaných odkazoch sa použije najnovšie vydanie citovaného dokumentu (vrátane všetkých zmien).

POZNÁMKA 1. – Ak bola medzinárodná publikácia zmenená spoločnými modifikáciami, čo je indikované označením (mod), použije sa príslušná EN/HD.

POZNÁMKA 2. – Aktuálne informácie o platných a zrušených STN a TNI možno získať na webovom sídle www.unms.sk.

ISO 13943 prijatá ako STN EN ISO 13943 Požiarna bezpečnosť. Slovník (ISO 13943) (92 0102)

ISO 24678-1 prijatá ako STN ISO 24678-1 Požiarnobezpečnostné inžinierstvo. Požiadavky na algebraické vzorce. Časť 1: Všeobecné požiadavky (92 0113)

Vypracovanie slovenskej technickej normy

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Technická komisia: TK 119 Hodnotenie požiarnej bezpečnosti materiálov a výrobkov

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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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of 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 www.iso.org/iso/foreword.html.

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

This first edition cancels and replaces ISO 16734:2006, which has been technically revised.

The main changes are as follows:

— the main body has been simplified by making reference to ISO 24678-1;

— comparisons with experimental data have been added in Annex A;

— Annex B has been added to describe input data on the fire source.

A list of all parts in the ISO 24678 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.

Introduction

The ISO 24678 series is intended to be used by fire safety practitioners involved with fire safety engineering calculation methods. It is expected that the users of this document are appropriately qualified and competent in the field of fire safety engineering. It is particularly important that users understand the parameters within which particular methodologies may be used.

Algebraic formulae conforming to the requirements of this document are used with other engineering calculation methods during a fire safety design. Such a design is preceded by the establishment of a context, including the fire safety goals and objectives to be met, as well as performance criteria when a trial fire safety design is subject to specified design fire scenarios. Engineering calculation methods are used to determine if these performance criteria are met by a particular design and if not, how the design needs to be modified.

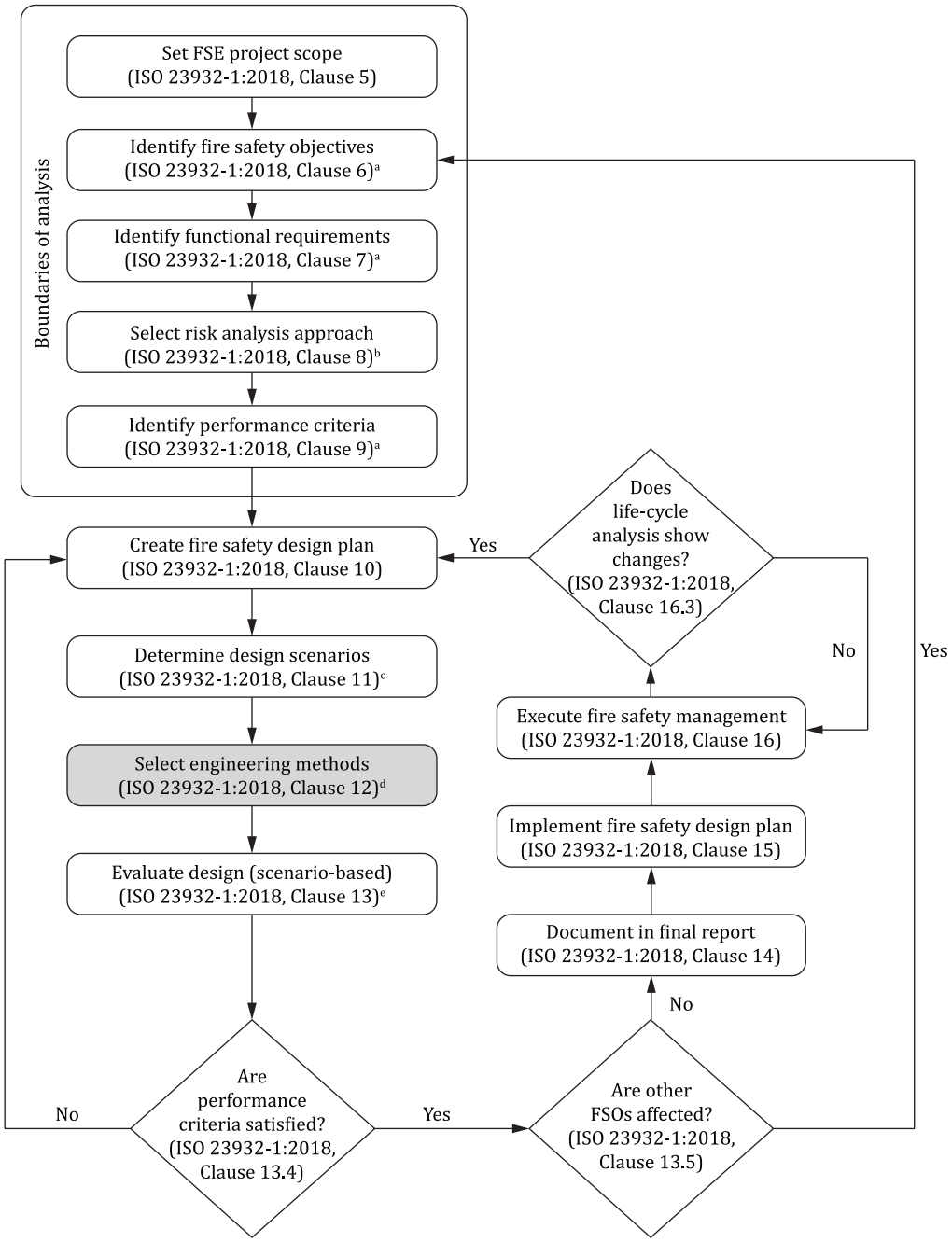
The subjects of engineering calculations include the fire-safe design of entirely new built environments, such as buildings, ships or vehicles, as well as the assessment of the fire safety of existing built environments.

The algebraic formulae discussed in this document can be useful for estimating the consequences of design fire scenarios. Such formulae are valuable for allowing the practitioner to quickly determine how a proposed fire safety design needs to be modified to meet performance criteria and to compare among multiple trial designs. Detailed numerical calculations can be carried out up until the final design documentation. Examples of areas where algebraic formulae have been applicable include determination of convective and radiative heat transfer from fire plumes, prediction of ceiling jet flow properties governing detector response times, calculation of smoke transport through vent openings, and analysis of compartment fire hazards such as smoke filling and flashover. However, the simple models often have stringent limitations and are less likely to include the effects of multiple phenomena occurring in the design scenarios.

The general principles of fire safety engineering are described in ISO 23932-1, which provides a performance-based methodology for engineers to assess the level of fire safety for new or existing built environments. Fire safety is evaluated through an engineered approach based on the quantification of the behaviour of fire and based on knowledge of the consequences of such behaviour on life safety, property and the environment. ISO 23932-1 provides the process (i.e. necessary steps) and essential elements for conducting a robust performance-based fire safety design.

ISO 23932-1 is supported by a set of fire safety engineering documents on the methods and data needed for all the steps in a fire safety engineering design as summarized in Figure 1 (taken from ISO 23932-1:2018, Clause 4). This set of documents is referred to as the Global fire safety engineering analysis and information system. This global approach and system of standards provides an awareness of the interrelationships between fire evaluations when using the set of fire safety engineering documents. The set of documents includes ISO/TS 13447, ISO 16730-1, ISO 16732-1, ISO 16733-1, ISO/TS 16733-2, ISO 16735, ISO 16736, ISO 16737, ISO/TR 16738, ISO 24678-1, ISO 24679-1, ISO/TS 29761 and other supporting Technical Reports that provide examples of and guidance on the application of these documents.

Each document supporting the global fire safety engineering analysis and information system includes language in the introduction to tie that document to the steps in the fire safety engineering design process outlined in ISO 23932-1. ISO 23932-1 requires that engineering methods be selected properly to predict the fire consequences of specific scenarios and scenario elements (ISO 23932:2018, Clause 12). Pursuant to the requirements of ISO 23932-1, this document provides the requirements governing algebraic formulae for fire safety engineering. This step in the fire safety engineering process is shown as a highlighted box in Figure 1 and described in ISO 23932-1.



a See also ISO/TR 16576 (Examples).

b See also ISO 16732-1, ISO 16733-1, ISO/TS 16733-2, ISO/TS 29761.

c See also ISO 16732-1, ISO 16733-1, ISO/TS 16733-2, ISO/TS 29761.

d See also ISO/TS 13447, ISO 16730-1, ISO/TR 16730-2 to ISO/TR 16730-5 (Examples), ISO 16735, ISO 16736, ISO 16737, ISO/TR 16738, ISO 24678-1, ISO 24678-2 (this document), ISO 24678-6 and ISO 24678-7.

e See also ISO/TR 16738, ISO 16733-1, ISO/TS 16733-2.

NOTE Documents linked to large parts of the fire safety engineering process: ISO 16732-1, ISO 16733-1, ISO 24679-1, ISO/TS 29761, ISO/TR 16732-2 to ISO/TR 16732-3 (Examples), ISO/TR 24679-2 to ISO/TR 24679-4 and ISO/TR 24679-6 (Examples).

Figure 1 — Flow chart illustrating the fire safety engineering design process (from ISO 23932-1:2018)

INTERNATIONAL STANDARD **ISO 24678-2:2022(E)**

Fire safety engineering — Requirements governing algebraic formulae —

Part 2: Fire plume

1 Scope

This document specifies the requirements governing the application of a set of explicit algebraic formulae for the calculation of specific characteristics of fire plume.

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 24678-1, *Fire safety engineering — Requirements governing algebraic formulae — Part 1: General requirements*