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Smoke and heat control systems —

Part 6: Specification for pressure differential systems

Systèmes pour le contrôle des fumées et de la chaleur —

Partie 6: Spécifications relatives aux systèmes à différentiel de pression

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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 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 the European Committee for Standardization (CEN), CEN/TC 191, *Fixed firefighting systems* (as EN 12101-6:2022) and was adopted, without modification other than those given below by Technical Committee ISO/TC 21, *Equipment for fire protection and fire fighting*, Subcommittee SC 11, *Smoke and heat control systems and components*.

— Editorial changes in 3.2, Symbols: the subscript elements are not written in italics.

— Normative references: the normative references were changed from the European Standard of the series EN 12101-xx into the ISO standard of the series ISO 21927-xx.

— Clause 7: Headline "Table 3" was added and the sentence above the table was rephrased.

A list of all parts in the ISO 21927 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

0.1 Objectives of pressure differential systems

Pressure differential systems offer the facility of maintaining tenable conditions in protected spaces, for example: escape routes, firefighting access routes, firefighting lift shafts, lobbies, staircases, and other spaces that require being kept free of smoke. It is necessary to determine not only where the fresh air supply for pressurization is to be introduced into a building, but also where that air and smoke will leave the building and what paths it will follow in the process.

The aim therefore is to establish a pressure gradient from the protected space to the unprotected space (fire room) while the doors are closed, and an airflow while the doors are open.

0.2 Smoke control methods

The effect of the air movement forces, described above, are to create pressure differentials across the partitions, walls and floors and can cause smoke to spread to spaces remote from the fire source. The technique most commonly used to limit the degree of smoke spread, or to control its effects, is pressurization.

0.3 System components

A typical pressure differential system will comprise three basic components:

a) components for providing supply air and to extract air;

b) components for controlling the pressure difference between the space with higher pressure and the adjoining space with lower pressure;

c) components for releasing air flowing through the door between the space with higher pressure to those with lower pressure (to prevent unwanted pressure build up in this space).

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Installations of pressure differential systems (PDS) may comprise:

— fans (temperature rated) if necessary;

— air or smoke control ducts to provide a passageway for the transmission of air or smoke;

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— ventilation openings to provide leakage of air (including dampers, active or passive controlled);

— power supply;

— connecting cables;

— means of activation;

— means of pressure control;

— control panel;

— smoke control dampers in branches from the ductwork where the ductwork is situated outside the protected enclosure;

— grilles and diffusers;

— door closers.

The design of pressure differential systems is covered in ISO 21927-13[1].

1) Under preparation. Stage at the time of publication ISO/DIS 21927-13:2025.

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Smoke and heat control systems —

Part 6:
Specification for pressure differential systems

1 Scope

This document applies to pressure differential system kits and components, positioned on the market and intended to operate as part of a pressure differential system. The purpose of a pressure differential system is to prevent protected spaces from smoke spread by using pressure difference and airflow. This document specifies characteristics and test methods for components and kits for pressure differential systems to produce and control the required pressure differential and airflow between protected and unprotected space.

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.

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ISO 13943, *Fire safety — Vocabulary*

ISO 21927-2, *Smoke and heat control systems — Part 2: Specifications for natural smoke and heat exhaust ventilators*

ISO 21927-3, *Smoke and heat control systems — Part 3: Specifications for powered smoke and heat exhaust ventilators*

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ISO 21927-8, *Smoke and heat control systems — Part 8: Smoke control dampers*

EN 1363-1, *Fire resistance tests — Part 1: General requirements*

EN 1366-8, *Fire resistance tests for service installations — Part 8: Smoke extraction ducts*

EN 1366-9, *Fire resistance tests for service installations — Part 9: Single compartment smoke extraction ducts*

EN 1366-10, *Fire resistance tests for service installations — Part 10: Smoke control dampers*

EN 1751, *Ventilation for buildings — Air terminal devices — Aerodynamic testing of damper and valves*

EN 13501-4, *Fire classification of construction products and building elements — Part 4: Classification using data from fire resistance tests on components of smoke control systems*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms, definitions and abbreviated terms

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

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