
Smoke and heat control systems —
Part 8:
Smoke control dampers

Systèmes pour le contrôle des fumées et de la chaleur —
Partie 8: Volets des désenfumage

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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 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 21, *Equipment for fire protection and fire fighting*, Subcommittee SC 11, *Smoke and heat control systems and components*.

A list of all the parts in the ISO 21927 series can be found on the ISO website.

Introduction

This document contains the basic performance and requirements for smoke control dampers that are to be used in conjunction with pressure differential systems and smoke and heat control systems. They can also be used to pressurize when gas extinguishing systems are used.

Particular reference is made to EN 1366-10, which defines the furnace testing associated with these products and EN 13501-4, which provides details on their fire resistance classification.

In addition to the prevention of transmission of smoke and combustion products from a fire zone, smoke control dampers are utilized to contain the spillage of otherwise harmful and toxic extinguishing gases from the affected area and for the control of pressurizing and excess air relief within pressurization systems.

Smoke control systems are designed to fulfil the following basic functions.

- a) The extraction of smoke from a single fire compartment to the outside of the building.
- b) The extraction of smoke from fire compartments of a building, using a SHEVS connected to one or more fire compartments. The smoke control system duct may or may not pass through other compartments of the building to reach the outside of the building.
- c) The use of pressurization to maintain smoke-free clear areas.

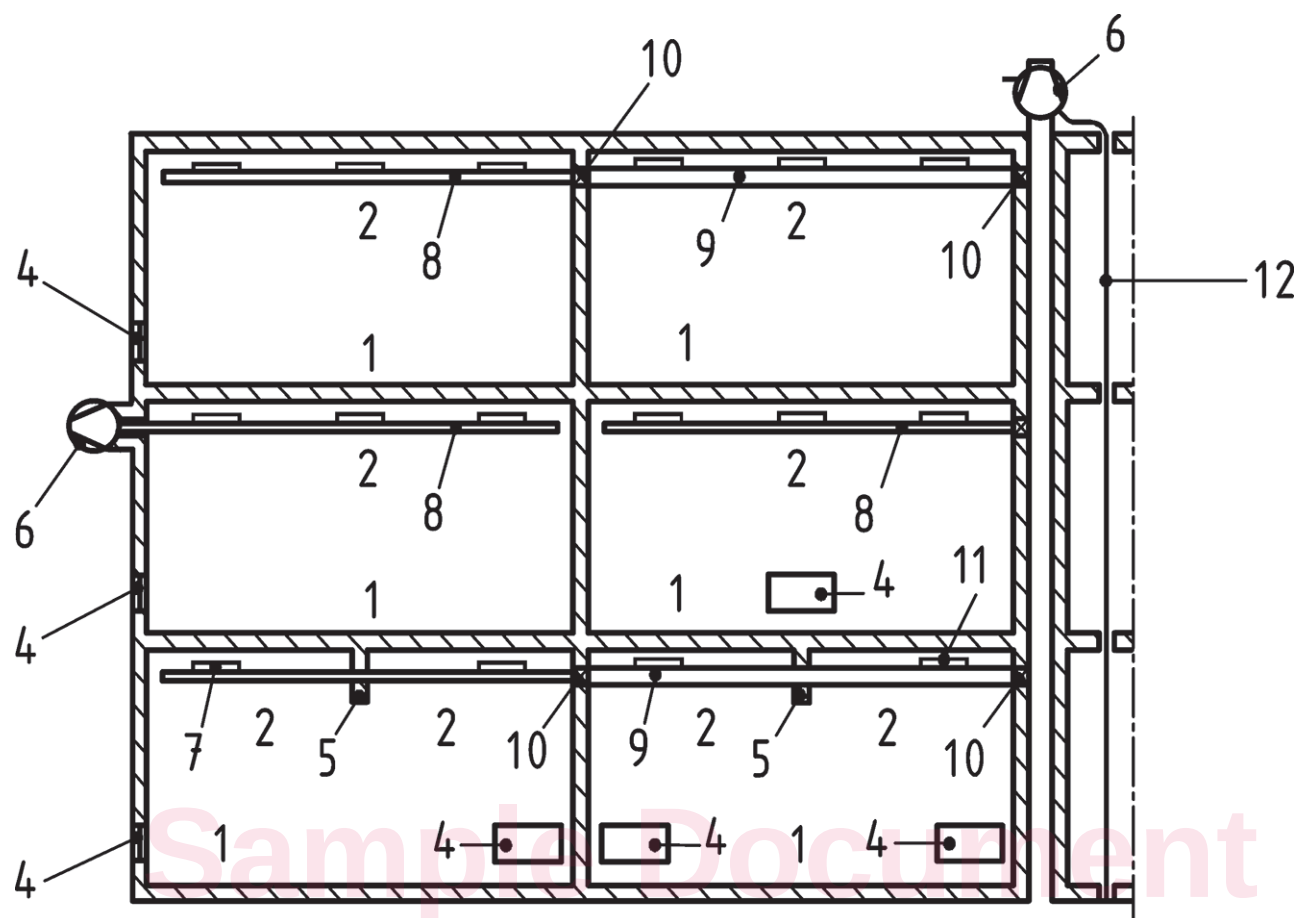
Smoke control dampers are commonly used in smoke and heat control systems as a means of limiting the number of ducts and high temperature fan units. The ducts into which such smoke control dampers are fitted generally serve a number of different fire compartments. The systems can be dedicated smoke extraction or possibly a combined environmental ventilation/smoke extraction.

The smoke and heat control system can remove smoke using either high temperature fans (in accordance with ISO 21927-3) or natural ventilators (in accordance with ISO 21927-2).

It may be necessary for a number of reasons (fire growth, smoke release, etc.) that the open smoke control damper(s) is (are) required to close and that the damper(s) previously closed is (are) required to open.

The tests defined in this document are based on the assumption that when smoke is detected within a building, all smoke control dampers other than those serving the fire compartment/smoke reservoir (where the fire has initiated) remain closed or move to the closed position. All smoke control dampers serving the smoke-affected fire compartment/smoke reservoir remain open or move to the open position, and the fan(s) started/natural vents opened.

NOTE [Figure 1](#) gives examples of installation positions, but these are not the only positions where dampers can be fitted.



Key

- 1 fire compartment
- 2 smoke reservoir
- 3 air inlet
- 4 smoke barrier
- 5 powered smoke and heat exhaust ventilator (fan)
- 6 smoke control dampers for single-compartment
- 7 smoke control ducts for single-compartment
- 8 smoke control ducts for multi-compartment
- 9 smoke control dampers for multi-compartment mounted inside or outside of wall or floor
- 10 smoke control dampers for multi-compartment mounted on the surface of the duct
- 11 electrical equipment

Figure 1 — Example of powered smoke and heat exhaust ventilation

Further guidance on the application of smoke control dampers can be found within the rest of the EN 12101 series and technical reports.

The areas for which products supplied to this document are considered applicable including, for example:

- a) commercial premises;
- b) shopping and retail centres;
- c) hospitals;

d) multi-residential buildings.

Smoke control dampers are intended for use in the following types of systems, including:

- 1) pressurization;
- 2) pressure relief;
- 3) extraction systems;
- 4) ductwork systems;
- 5) inerting fire suppression systems.

It is realized that all the above systems do not address smoke directly, but similar properties are required of such smoke control dampers to limit leakage in a fire and smoke control situation.

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