INTERNATIONAL STANDARD

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Fire tests — Smoke-control door and shutter assemblies —

Part 1: Ambient- and medium-temperature leakage tests

Essais au feu — Assemblages porte et volet pare-fumée —
Partie 1: Essais de fuite à température ambiante et moyenne

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 5925-1 was prepared by Technical Committee ISO/TC 92, *Fire safety*, Subcommittee SC 2, *Fire containment*.

This second edition cancels and replaces the first edition (ISO 5925-1:1981), which has been technically revised.

ISO 5925 consists of the following parts, under the general title *Fire tests — Smoke-control door and shutter assemblies*:

— *Part 1: Ambient- and medium-temperature leakage tests*

— *Part 2: Commentary on test method and the applicability of test conditions and the use of test data in a smoke containment strategy*

Introduction

This part of ISO 5925 has been prepared to provide a test method for determining the smoke leakage through door and shutter assemblies. It is part of the series of International Standards dealing with fire doors, e.g. ISO 3008.

This second edition of ISO 5925-1 combines the procedure published in the first edition and the proposed revisions to it on medium-temperature testing. A further test procedure planned as Part 3 for high-temperature testing is currently in abeyance. Additional requirements for the installation and use of smoke-control door and shutter assemblies can be found in other International Standards and national regulations.

Fire tests — Smoke-control door and shutter assemblies —

Part 1:
Ambient- and medium-temperature leakage tests

1 Scope

The test described in this part of ISO 5925 determines the rate of leakage of ambient (cold) and medium (warm) temperature smoke from one side of door and shutter assemblies to the other under the specified test conditions. The test is applicable to door and shutter assemblies of different configurations intended for purposes of controlling the passage of smoke in case of fire.

The acceptable leakage rates for different situations are not addressed in this part of ISO 5925, but rather are specified by the regulations of the controlling authorities.

The principle of the test is explained briefly in Annex A.

2 Normative references

The following referenced documents are indispensable for the application 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 834-1, *Fire-resistance tests — Elements of building construction — Part 1: General requirements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
door and shutter assembly
complete assembly, including any frame or guide, door leaf or leaves, rolling or folding curtain, etc., which is provided for closing of permanent openings in separating elements

NOTE This includes all side-panels, vision panels or transom panels, grilles and louvers together with door hardware, and any fire seals, smoke seals, draught seals and acoustic seals which are used in the assembly.

3.2
smoke-control door and shutter assembly
door and shutter assembly that, when in a closed position, has the function of restricting the passage of smoke to prescribed limits

3.3
ambient temperature
average air temperature of (20 ± 10) °C

3.4
medium temperature
average air temperature of (200 ± 20) °C

3.5
leakage rate
rate of air flow, corrected to standard temperature and pressure conditions, measured under specified differential pressure across a closed door and shutter assembly

NOTE Leakage rate is expressed in cubic metres per hour.

3.6
differential pressure
difference in static pressure created during the test between the inside and outside of the test chamber, as measured across a closed door

NOTE The symbol for pressure is p and it is expressed in pascals (1 Pa = 1 N/m^2).

3.7
test specimen
door and shutter assembly on which leakage measurements are to be made, including all components necessary for the use of the door when installed in a building, the seal between the frame and the wall and any associated construction which is provided

3.8
associated construction
specific form of construction into which the test specimen can be mounted

NOTE If an associated construction is used in the test, it shall be identical to that in which the door and shutter assembly is designed to be installed in practice. The method of sealing the joint between the test specimen and the associated construction is specific to that construction and forms part of the construction being evaluated by the test.

3.9
supporting construction
impermeable form of construction of adequate strength and stiffness to support the test specimen when an associated construction is not provided and to fill the opening in the test chamber when an associated construction is provided

NOTE The seal between the test assembly and the supporting construction is intended to be impermeable and withstand the test temperature, but it is not considered as part of the test construction being evaluated.

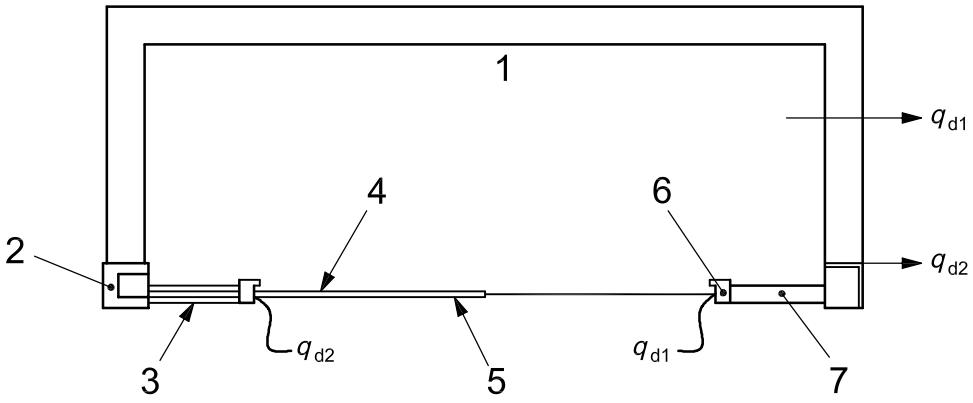
4 Symbols and abbreviated terms

See Figure 1.

q_a apparatus (test chamber) leakage rate, expressed in cubic metres per hour, corrected to standard reference conditions for temperature and pressure (see 10.2)

q_t total leakage rate, expressed in cubic metres per hour. This is the leakage rate measured in the test and includes the leakage rate of the test specimen and the test chamber corrected to the standard reference conditions for temperature and pressure (see 10.2)

q_d test specimen leakage rate. This is the leakage rate for the test specimen and is calculated as $q_d = q_t - q_a$



Key

1 test chamber
2 test frame
3 associated construction
4 test door
5 test door with its frame
6 door frame
7 supporting frame

Subscripts

a apparatus
t total
d door

$q_a = q_{a1} + q_{a2}$

$q_t = q_a + q_d$

$q_d = q_{d1} + q_{d2}$

Figure 1 — Test apparatus

5 Test apparatus

The test apparatus consists essentially of a test chamber with an open front in which the test specimen (door sample) is mounted to provide a sealed enclosure. The opening shall be sufficient to accommodate the door sample with its associated and/or supporting construction. In general, an opening of 3 m × 3 m is sufficient.

A smaller apparatus is feasible if its use is restricted to normal single-leaf doors.

An air supply system shall be provided to create a pressure differential across the door sample of at least 55 Pa. Provision shall be made to heat the circulating air to the test temperature of (200 ± 20) °C and to control the temperature within the prescribed limits. Annex B provides a general specification for a suitable apparatus, but other designs can achieve the same objectives.

The test apparatus leakage rate, q_a, shall not exceed 7 m^3/h at ambient or medium temperature. The air supply and heating systems shall be able to replace air at ambient temperature and medium temperature to compensate for leakage rates through the door sample up to 55 m^3/h.