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**Fire containment — Elements of building  
construction —**

**Part 1:  
Ventilation ducts**

*Endiguement du feu — Éléments de construction —  
Partie 1: Conduits de ventilation*

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## Contents — Page

Foreword.....	vii
Introduction.....	ix
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	2
4 Apparatus.....	2
5 Test conditions.....	20
6 Test specimen.....	20
6.1 Size.....	20
6.1.1 General.....	20
6.1.2 Length.....	20
6.1.3 Cross-section.....	20
6.2 Number.....	20
6.3 Design.....	21
6.3.1 General.....	21
6.3.2 Minimum separation.....	21
6.3.3 Configuration of duct A (horizontal only).....	21
6.3.4 Openings in duct B.....	21
6.3.5 Joints in horizontal ducts.....	21
6.3.6 Joints in vertical ducts.....	23
6.3.7 Support for vertical ducts.....	24
6.3.8 Compensators.....	24
7 Installation of test specimen.....	24
7.1 General.....	24
7.2 Standard supporting construction.....	25
7.3 Non-standard supporting constructions.....	26
7.4 Restraint of ducts.....	27
7.4.1 Inside the furnace.....	27
7.4.2 At the penetration point.....	27
7.4.3 Outside the furnace.....	27
7.4.4 Closure.....	27
7.4.5 Fire stopping.....	27
7.4.6 Unsupported vertical ducts.....	27
8 Conditioning.....	27
8.1 General.....	27

8.2	Hygroscopic sealing materials .....	27
9	Application of instrumentation .....	28
9.1	Thermocouples.....	28
9.1.1	Furnace thermocouples (plate thermometers) .....	28
9.1.2	Unexposed surface thermocouples .....	32
9.2	Pressure.....	38
10	Test procedure.....	38
10.1	General.....	38
10.2	Control of conditions to permit assessment of integrity.....	38
10.2.1	Duct A .....	38
10.2.2	Duct B .....	38
10.3	Test measurements and observations.....	39
10.3.1	Integrity.....	39
10.3.2	Insulation .....	39
10.3.3	Restraint forces and thermal elongation or shortening.....	39
10.3.4	Additional observations.....	40
10.4	Termination of the test.....	40
11	Performance criteria .....	40
11.1	Integrity.....	40
11.2	Insulation .....	40
11.2.1	General .....	40
11.2.2	Ducts with internal combustible linings only .....	40
11.3	Smoke leakage .....	41
11.4	Determination of fire resistance .....	41
12	Test report.....	41
13	Field of direct application of test results .....	41
13.1	General.....	41
13.2	Vertical and horizontal ducts.....	41
13.3	Sizes of ducts .....	42
13.4	Pressure difference.....	42
13.5	Height of vertical ducts .....	42
13.5.1	Ducts supported at each storey .....	42
13.5.2	Self-loadbearing ducts .....	43
13.5.3	Limitations on buckling .....	43
13.6	Suspension devices for horizontal ducts .....	43
13.7	Supporting construction.....	44
13.8	Steel ducts.....	44

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<https://standards.iteh.ai>  
 Document Preview

<https://standards.iteh.ai/catalog/standards-iso/6369aa9d-56c8-4622-b773-266976498804/iso-1418-07-11>

Annex A (informative) General guidance.....	45
A.1 General.....	45
A.2 Notes on apparatus.....	45
A.2.1 Volume flow-measuring station .....	45
A.2.2 Extraction fan.....	45
A.3 Notes on test specimens.....	45
A.3.1 Design.....	45
A.3.2 Thermal elongation, shortening and restraint forces.....	46
A.4 Notes on test conditions.....	47
A.4.1 Temperature/time development.....	47
A.4.2 Anticipated pressure ranges.....	47
A.5 Notes on procedure .....	47
A.5.1 Air velocity in duct B.....	47
A.5.2 Evaluation of duct in overpressure conditions.....	47
A.5.3 Insulation and integrity.....	48
A.6 Use of alternative elbow.....	48
A.7 Avoidance of flame impingement.....	48
Bibliography.....	50

  
<https://standards.iteh.ai>  
 Document Preview

Foreword — iv
Introduction — v
1 — Scope — 1
2 — Normative references — 2
3 — Terms and definitions — 2
4 — Apparatus — 2
5 — Test conditions — 10
6 — Test specimen — 10
7 — Installation of test specimen — 13
8 — Conditioning — 15
9 — Application of instrumentation — 16
10 — Test procedure — 22
11 — Performance criteria — 23
12 — Test report — 24
13 — Field of direct application of test results — 25
Annex A (informative) General guidance — 28
Bibliography — 32

[ISO/FDIS 6944-1](https://standards.iteh.ai)

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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~~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](http://www.iso.org/directives)).

ISO draws attention to the possibility that ~~some of the elements implementation~~ of this document may ~~involve the subject use of (a) patent(s)~~. ISO takes no position concerning the evidence, validity or applicability of ~~any claimed patent rights in respect thereof~~. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

ISO 6944-1~~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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC\_92, *Fire safety*, Subcommittee SC\_2, *Fire containment*Resistance.

This ~~first~~second edition of ISO 6944-1, ~~cancels and replaces the first edition (ISO 6944:1985,-1:2008), of which has been technically revised.~~

~~ISO 6944 consists of the following parts, under the general title *Fire containment — Elements of building construction*:~~

~~— Part 1: *Ventilation ducts*~~

~~— Part 2: *Kitchen extract ducts*~~

~~This isit constitutes a minor revision to this standard and contain the following changes. It also incorporates the Amendment ISO 6944-1:2008/Amd. 1:2015.~~

~~Update to referenced standards~~

~~Delete~~The changes are as follows:

~~— references to ISO 5221:1984 which has been (withdrawn and replace) have been replaced with references to ISO 5167-2:2022 and ISO 5167-3:2022;~~

~~Revision of Keys to Figure 4 – Gas velocity station for Duct B~~

~~Key~~

- ~~18 horizontal duct A-B~~
- ~~19 vertical duct A-B~~
- ~~20 pressure differential of 300 Pa (Duct A only, not required for Duct B)~~

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~~— key element 2 in Figure 2 and key elements 18, 19 and 20 to Figure 4 have been revised.~~

~~A list of all parts in the ISO 6944 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](http://www.iso.org/members.html).~~

~~<https://standards.iteh.ai/catalog/standards/iso/85c9aa9d-36cb-4622-b775-20897b458b01/iso-fdis-6944-1>~~



## Introduction

The purpose of this test is to measure the ability of a representative duct or duct assembly that is part of an air-distribution system to resist the spread of fire from one fire compartment to another, with fire attack from inside or outside the duct. It is applicable to vertical and horizontal ducts, with or without branches, taking into account joints and exhaust openings, as well as suspension devices and penetration points.

This [part of ISO 6944 document](#) is very similar to EN 1366-1, but includes an alternative arrangement for testing elbows.

The test measures the length of time during which ducts of specified dimensions, suspended as they normally are in practice, satisfy defined criteria when exposed to fire from either inside or outside the duct.

All ducts inside the furnace are fully restrained in all directions. Outside the furnace, ducts exposed to fire from the outside are tested unrestrained, while ducts exposed to fire from the inside (horizontal only) are tested restrained.

The test takes into account the effect of fire exposure from the outside, where a 300 Pa underpressure is maintained in the duct, as well as the effect of fire entering the ducts under conditions where forced air movement ~~might or might not~~ [is potentially \(but not necessarily\)](#) present, by maintaining an air velocity of 3 m/s.

Ducts exposed to fire from the inside are supplied with air in a manner that is representative of the “fan off” and “fan on” situations that can arise in practice.

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# Fire containment — Elements of building construction —

## Part 1: Ventilation ducts

**CAUTION**— The attention of all persons concerned with managing and carrying out this fire resistance test is drawn to the fact that fire testing can be hazardous and that there is the possibility that toxic and/or harmful smoke and gases can be evolved during the test. Mechanical and operational hazards can also arise during the construction of the test elements or structures, their testing and the disposal of test residues.

~~It is strongly recommended that the~~The duct assembly should be allowed to cool completely after the fire test, before dismantling, to minimize the possibility of ignition of combustible residues.

An assessment of all potential hazards and risks to health shall be made and safety precautions shall be identified and provided. Written safety instructions shall be issued. Appropriate training shall be given to relevant personnel. Laboratory personnel shall ensure that they follow written safety instructions at all times.

### 1 Scope

This ~~part of ISO 6944~~document specifies a method for determining the fire resistance of vertical and horizontal ventilation ducts under standardized fire conditions. The test examines the behaviour of ducts exposed to fire from the outside (duct A) and fire inside the duct (duct B). ~~This document~~ is intended ~~that this part of ISO 6944~~to be used in conjunction with ISO 834-1.

This ~~part of ISO 6944~~document is not applicable to: ~~944-1~~

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a) ducts whose fire resistance depends on the fire resistance performance of a ceiling;

b) ducts containing fire dampers at points where they pass through fire separations;

c) doors of inspection openings, unless included in the duct to be tested;

d) two-sided or three-sided ducts;

e) the fixing of suspension devices to floors or walls;

f) ~~Kitchen~~extract ducts (see ISO 6944-2).

NOTE [Annex A](#) provides general guidance and gives background information.

### 2 Normative references

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

ISO 5167-1, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 1: General principles and requirements*

ISO 5167-2, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 2: Orifice plates*

ISO 5167-3, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 3: Nozzles and Venturi nozzles*

ISO 13943, *Fire safety — Vocabulary*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 834-1 and 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](https://www.iso.org/obp)

— [IEC Electropedia: available at https://www.electropedia.org/](https://www.electropedia.org/)

**3.1**  
**fire-resisting duct**  
duct used for the distribution or extraction of air and designed to provide a degree of fire resistance

**3.2**  
**suspension device**  
components used for supporting and fixing a duct from a floor or supporting a duct from a wall

**3.3**  
**supporting devices construction device**  
wall, partition or floor through which the duct passes during the test

**3.4**  
**compensator**  
device that is used to prevent damage from the forces generated by expansion

### 4 Apparatus

**4.1** In addition to the test equipment specified in ISO 834-1, the following apparatus is required.

**4.2 Furnace**, capable of subjecting ventilation ducts to the standard heating conditions specified in ISO 834-1 and suitable for testing ducts in the vertical (see [Figure 1](#))~~Figure 1~~) or horizontal (see [Figure 2](#))~~Figure 2~~) orientation.

[Figures 1 and 2](#)~~Figures 1 and 2~~ show two ducts being tested together. When two ducts are tested together, they shall be separated by a minimum of 500 mm. It is also permitted to test each duct singularly in the furnace.

**4.3 Fan A**, capable of producing an underpressure of  $(300 \pm 15)$  Pa within duct A (see [Figure 3](#))~~Figure 3~~) at the start and throughout the test, and [which](#) shall be connected, either directly or by a suitable length of flexible ducting, to the [volume flow](#)-measuring station ~~(4.5)~~~~(4.5)~~.

**4.4 Fan B**, capable of producing an air velocity when extracting gas from duct B (see [Figure 4](#))~~Figure 4~~) of at least 3 m/s measured at ambient temperature in the duct before the test.

It shall be connected, either directly or by a suitable length of flexible ducting, to the velocity-measuring station ~~(4.8)~~~~(4.8)~~. The fan shall be provided with a by-pass vent that can be opened prior to shutting the damper ~~(4.7)~~~~(4.7)~~.

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Dimensions in millimetres

