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**Požarni preskusi - Sobni preskus v naravnem merilu za obložne izdelke (prevzet standard ISO 9705:1993 in tehnični popravek ISO 9705:1993/Cor.1:1993 z metodo platnice)**

Fire tests - Full-scale room test for surface products

Essais au feu - Essai dans une pièce en vraie grandeur pour les produits de surface

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SIST ISO 9705:1995

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## UVOD

Standard SIST ISO 9705 (en), Požarni preskusi - Sobni preskus v naravnem merilu za obložne izdelke, prva izdaja, 1995, ima status slovenskega standarda in je z metodo platnice prevzet mednarodni standard ISO 9705, Fire tests - Full-scale room test for surface products, 1993, skupaj s tehničnim popravkom 1:1993, v angleškem jeziku.

## NACIONALNI PREDGOVOR

Mednarodni standard ISO 9705:1993 in tehnični popravek 1:1993 je pripravil tehnični odbor Mednarodne organizacije za standardizacijo ISO/TC 92 Požarni preskusi gradbenih materialov, elementov in konstrukcij, pododbor SC 1 Odzivnost materialov na ogenj.

Odločitev za prevzem tega standarda je sprejel tehnični odbor USM/TC POO Požarno preskušanje materialov in konstrukcij.

Ta slovenski standard je dne 1995-10-09 odobril direktor USM.

## ZVEZA S STANDARDOM

S prevzemom tega mednarodnega standarda velja naslednja zveza:

SIST ISO 3261:1995 (sl) Požarni preskusi - Slovar

## OSNOVA ZA IZDAJO STANDARDA

Prevzem standarda ISO 9705:1993 in tehničnega popravka ISO 9705:1993/Cor.1:1993

## OPOMBI

- Popsod, kjer se v besedilu standarda uporablja izraz mednarodni standard, v SIST ISO 9705:1995 to pomeni slovenski standard
- Uvod in nacionalni predgovor nista sestavni del standarda.

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# INTERNATIONAL STANDARD

# ISO 9705

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## Fire tests — Full-scale room test for surface products

**iTeh STANDARD PREVIEW**  
([standards.iteh.ai](https://standards.iteh.ai))

*Essais au feu — Essai dans une pièce en vraie grandeur pour les produits  
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Reference number  
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## Annexes

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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.

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.

International Standard ISO 9705 was prepared by Technical Committee ISO/TC 92, *Fire safety*, Subcommittee SC 1, *Reaction to fire*.

Annex A forms an integral part of this International Standard. Annexes B, C, D, E, F, G and H are for information only.

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## Introduction

This method is intended to describe the fire behaviour of a product under controlled laboratory conditions.

The test method may be used as part of a fire hazard assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use.

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# Fire tests — Full-scale room test for surface products

**WARNING** — So that suitable precautions can be taken to safeguard health, the attention of all concerned in fire tests is drawn to the possibility that toxic or harmful gases can be evolved during combustion of test specimens.

The test procedures involve high temperatures and combustion processes from ignition to a fully developed room fire. Therefore, hazards can exist for burns, ignition of extraneous objects or clothing. The operators should use protective clothing, helmet, face-shield and equipment for avoiding exposure to toxic gases.

Means for extinguishing a fully developed fire should be available.

## 1 Scope

This International Standard specifies a test method that simulates a fire that under well ventilated conditions starts in a corner of a small room with a single open doorway.

The method is intended to evaluate the contribution to fire growth provided by a surface product using a specified ignition source.

A standard ignition source is specified, but other alternatives are allowed. It should, however, be noted that the type, position and heat output of the ignition source will considerably influence the fire growth.

The method is especially suitable for products that for some reason cannot be tested in a small laboratory scale, for example thermoplastic materials, the effect of an insulating substrate, joints, surfaces with great irregularity.

The method is not intended to evaluate the fire resistance of a product.

A test performed in accordance with the method specified in this International Standard provides data for the early stages of a fire from ignition up to flashover.

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## 2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3261:1975, *Fire tests — Vocabulary*.

## 3 Definitions

For the purposes of this International Standard, the definitions given in ISO 3261 and the following definitions apply.

**3.1 assembly:** Fabrication of materials and/or composites, for example, sandwich panels.

NOTE 1 An assembly may include an air gap.

**3.2 composite:** Combination of materials which are generally recognized in building construction as discrete entities, for example, coated or laminated materials.

**3.3 exposed surface:** That surface of the product subjected to the heating conditions of the test.

**3.4 material:** Single substance or uniformly dispersed mixture, for example, metal, stone, timber, concrete, mineral fibre, polymers.

**3.5 product:** Material, composite or assembly about which information is required.

**3.6 specimen:** Representative piece of the product which is to be tested together with any substrate or treatment.

NOTE 2 The specimen may include an air gap.

**3.7 surface product:** Any part of a building that constitutes an exposed surface on the interior walls and/or the ceiling such as panels, tiles, boards, wall papers, sprayed or brushed coatings.

## 4 Principle

The potential for fire spread to other objects in the room, remote from the ignition source, is evaluated by measurements of the total heat flux incident on a heat flux meter located on the centre of the floor.

The potential for fire spread to objects outside the room of origin is evaluated by the measurement of the total rate of heat release of the fire.

An indication of the toxic hazard is provided by the measurement of certain toxic gases.

The hazard of reduced visibility is estimated by the measurement of production of light-obscuring smoke.

The fire growth is visually documented by photographic and/or video recording.

NOTE 3 If further information is required, measurements of the gas temperature in the room and the mass flow in and out the doorway may be performed.

## 5 Fire test room

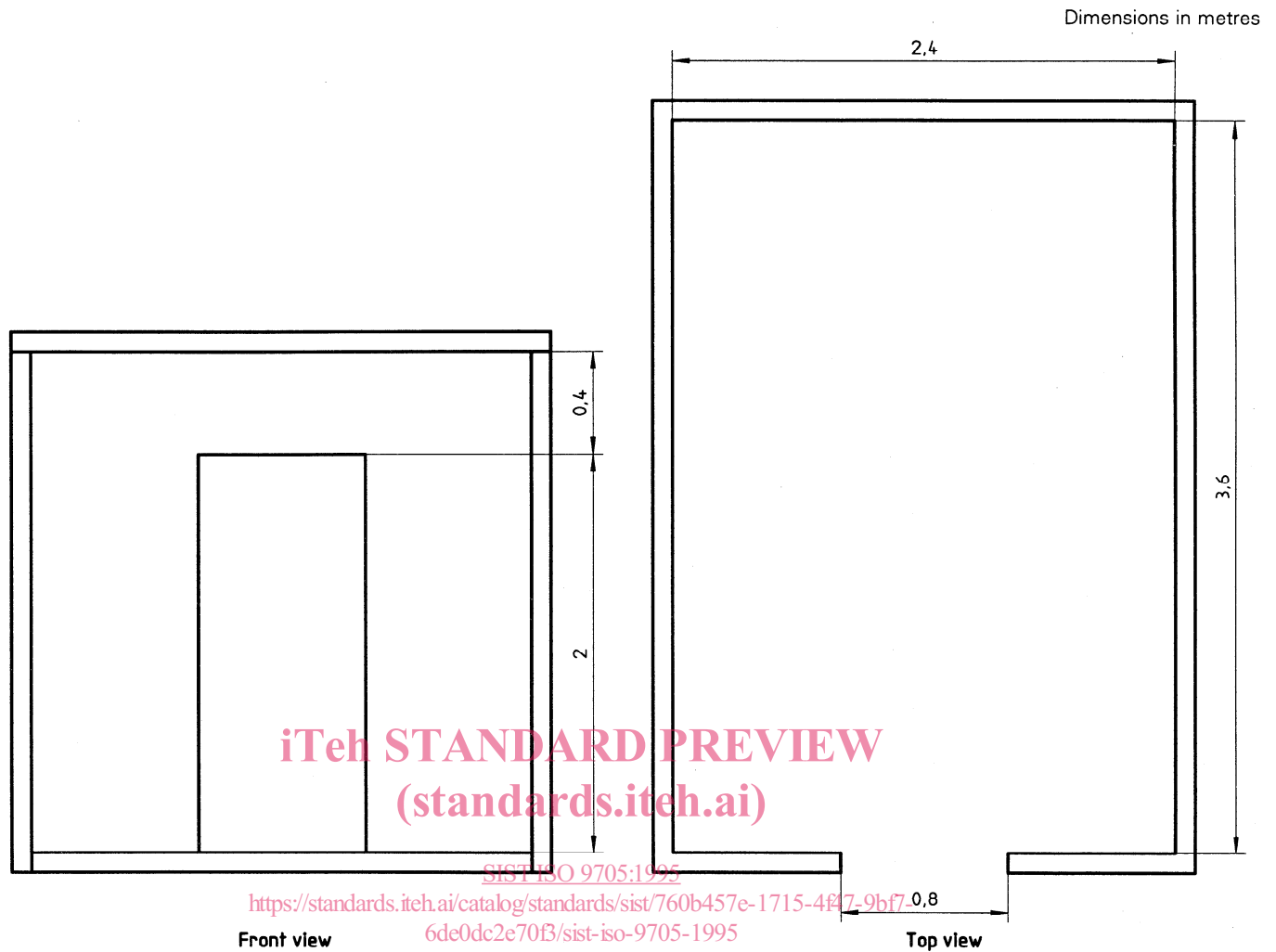
**5.1** The room (see figure 1) shall consist of four walls at right angles, a floor and a ceiling and shall have the following inner dimensions:

- a) length: 3,6 m  $\pm$  0,05 m;
- b) width: 2,4 m  $\pm$  0,05 m;
- c) height: 2,4 m  $\pm$  0,05 m.

The room shall be placed indoors in an essentially draught free, heated space, large enough to ensure that there is no influence on the test fire. In order to facilitate the mounting of the instruments and of the ignition source, the test room may be placed so that the floor can be reached from beneath.

**5.2** There shall be a doorway in the centre of one of the 2,4 m  $\times$  2,4 m walls and no other wall, floor or ceiling shall have any openings that allow ventilation. The doorway shall have the following dimensions:

- a) width: 0,8 m  $\pm$  0,01 m;
- b) height: 2,0 m  $\pm$  0,01 m.



**Figure 1 — Fire test room**

**5.3** The test room shall be constructed of non-combustible material with a density of  $500 \text{ kg m}^{-3}$  to  $800 \text{ kg m}^{-3}$ . The minimum thickness of the construction shall be 20 mm.

## 6 Ignition source

### 6.1 Recommended sources

It is recommended to use one of the ignition sources specified in annex A to which the following requirements apply.

**6.1.1** The ignition source shall be a propane gas burner having a square top surface layer of a porous, inert material, e.g. sand. The construction shall be such that an even gas flow is achieved over the entire opening area.

The ignition source is a propane gas burner that consumes relatively large amounts of gas. The attention is therefore drawn to the following warning.

**WARNING — All equipment such as tubes, couplings, flowmeters, etc. shall be approved for propane. The installations shall be performed in accordance with existing regulations.**

**The burner should, for reasons of safety, be equipped with a remote-controlled ignition device, for example a pilot flame or a glow wire. There should be a warning system for leaking gas and a valve for immediate and automatic cut-off of the gas supply in case of extinction of the ignition flame.**

**6.1.2** The burner shall be placed on the floor in a corner opposite to the doorway wall. The burner walls shall be in contact with the specimen.

**6.1.3** The burner shall be supplied with natural grade propane (95 % purity). The gas flow to the burner shall be measured with an accuracy of at least  $\pm 3\%$ . The heat output to the burner shall be controlled within  $\pm 5\%$  of the prescribed value.

## 6.2 Alternative sources

Alternative sources as specified in annex B may also be used.

## 7 Heat flux instrumentation in the fire room

This clause specifies minimum requirements for heat flux instrumentation in the fire room. Additional information and designs can be found in annex C.

### 7.1 Specification

The heat flux meter shall be of the Gardon (foil) or the Schmidt-Boelter (thermopile) type with a design range of about  $50 \text{ kW m}^{-2}$ . The target area shall be a flat black surface having a view angle of  $180^\circ$ . The heat flux meter shall have an accuracy of at least  $\pm 3\%$  and a repeatability within  $0,5\%$ . In operation, the meter shall be maintained at a constant temperature (within  $\pm 5^\circ\text{C}$ ) above the dew point.

### 7.2 Location

The heat flux meter shall be mounted at the geometric centre of the floor. The target area shall be 5 mm to 30 mm above the floor surface. Radiation shall not pass through any window before reaching the target.

### 7.3 Calibration

The calibration of the heat flux meter shall be checked whenever required, by comparison with two instruments held as reference standards and not used for any other purpose. One of the reference standards shall be fully calibrated at yearly intervals.

NOTE 4 An example procedure is given in BS 6809.

## 8 Hood and exhaust duct

The system for collecting the combustion products shall have a capacity and be designed in such a way that all of the combustion products leaving the fire room through the doorway during a test are collected. The system shall not disturb the fire-induced flow in the doorway. The exhaust capacity shall be at least  $3,5 \text{ m}^3 \text{ s}^{-1}$  at normal pressure and a temperature of  $25^\circ\text{C}$ .

NOTE 5 An example of one design of hood and an exhaust duct is given in annex D.

## 9 Instrumentation in the exhaust duct

This clause specifies minimum requirements for instrumentation in the exhaust duct. Additional information and designs can be found in annex E.

### 9.1 Volume flow rate

The volume flow rate in the exhaust duct shall be measured to an accuracy of at least  $\pm 5\%$ .

The response time to a stepwise change of the duct flow rate shall be a maximum of 1 s at 90 % of the final value.

### 9.2 Gas analysis

#### 9.2.1 Sampling line

The gas samples shall be taken in the exhaust duct at a position where the combustion products are uniformly mixed. The sampling line shall be made from an inert material which will not influence the concentration of the gas species to be analysed. (See annex E.)

#### 9.2.2 Oxygen

The oxygen consumption shall be measured with an accuracy of at least  $\pm 0,05\%$  (V/V) oxygen. The oxygen analyser shall have a time constant not exceeding 3 s. (See annex E.)

#### 9.2.3 Carbon monoxide and carbon dioxide

The gas species shall be measured using analysers having an accuracy of at least  $\pm 0,1\%$  (V/V) for carbon dioxide and  $\pm 0,02\%$  (V/V) for carbon monoxide. The analysers shall have a time constant not exceeding 3 s. (See annex E.)

### 9.3 Optical density

#### 9.3.1 General

The optical density of the smoke is determined by measuring the light obscuration with a system consisting of a lamp, lenses, an aperture and a photocell, (see figure 2). The system shall be constructed in such a way as to ensure that soot deposits during the test do not reduce the light transmission by more than 5 %.