

**SLOVENSKI STANDARD**  
**oSIST prEN 16854:2015**  
**01-junij-2015**

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**Toplotnoizolacijski proizvodi za opremo stavb in industrijske inštalacije -  
Ugotavljanje požarne odpornosti saj toplotnoizolacijskih proizvodov za dimnike**

Thermal insulation products for building equipment and industrial installations -  
Determination of soot fire resistance of thermal insulation products for the use in  
chimneys

Wärmedämmstoffe für die technische Gebäudeausrüstung und für betriebstechnische  
Anlagen in der Industrie - Bestimmung der Rußbrandbeständigkeit von  
Wärmedämmstoffen bei der Verwendung in Abgasanlagen

Produits isolants thermiques pour l'équipement du bâtiment et les installations  
industrielles - Détermination de la résistance au feu de cheminée des produits isolants  
thermiques destinés à être utilisés dans des conduits de fumée

**Ta slovenski standard je istoveten z: prEN 16854**

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**ICS:**

13.220.50	Požarna odpornost gradbenih materialov in elementov	Fire-resistance of building materials and elements
91.060.40	Dimniki, jaški, kanali	Chimneys, shafts, ducts
91.100.60	Materiali za toplotno in zvočno izolacijo	Thermal and sound insulating materials

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**en,fr,de**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 16854**

April 2015

ICS 91.060.40; 91.100.60

English Version

## Thermal insulation products for building equipment and industrial installations - Determination of soot fire resistance of thermal insulation products for the use in chimneys

Wärmedämmstoffe für die technische Gebäudeausrüstung  
und für betriebstechnische Anlagen in der Industrie -  
Bestimmung der Rußbrandbeständigkeit von  
Wärmedämmstoffen bei der Verwendung in Abgasanlagen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 88.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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## Foreword

This document (prEN 16854:2015) has been prepared by Technical Committee CEN/TC 88 “Thermal insulating materials and products”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This European Standard is one of a series of standards that specify test methods for determining dimensions and properties of thermal insulating materials and products. It supports a series of product standards for thermal insulating materials and products that derive from the Council Directive of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products (Directive 89/106/EEC) through the consideration of the essential requirements.

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prEN 16854:2015 (E)

## Introduction

This European Standard has been prepared for products used to insulate building equipment and industrial installations, but it may also be applied to products used in other areas.

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## 1 Scope

This European Standard applies to thermal insulation products for use in chimneys. It describes the durability test against soot fire.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 590, *Automotive fuels - Diesel - Requirements and test methods*

EN 1443, *Chimneys - General requirements*

EN 1856-1, *Chimneys - Requirements for metal chimneys - Part 1: System chimney products*

EN 13063-1, *Chimneys - System chimneys with clay/ceramic flue liners - Part 1: Requirements and test methods for sootfire resistance*

EN 13063-2, *Chimneys - System chimneys with clay/ceramic flue liners - Part 2: Requirements and test methods under wet conditions*

EN 13063-3, *Chimneys - System chimneys with clay/ceramic flue liners - Part 3: Requirements and test methods for air flue system chimneys*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions used in EN 1443, EN 1856-1 and EN 13063-1, EN 13063-2 and EN 13063-3 apply.

## 4 Principle

This test method describes the determination of the soot fire resistance of the thermal insulation products for the use in chimneys. This requirement is deemed to have been satisfied if the surface temperature at the test specimen shall not exceed the rise in temperature during the initial exposure after three test cycles by more than 10 %.

## 5 Apparatus

The test rig comprises the fire box (5.1), the burner (5.2) and the measuring equipment (5.3). The test rig shall be set up in a closed room (test room). The dimensions of the fire box, including floor, ceiling, walls and openings, shall be in accordance with Figure 1.

### 5.1 Fire box

The walls of the fire box shall be made of fire bricks with a density of between 1,9 kg/dm<sup>3</sup> and 2,1 kg/dm<sup>3</sup> placed in a steel frame. The ceiling and floor shall be made of refractory concrete with a density of between 2,0 kg/dm<sup>3</sup> and 2,2 kg/dm<sup>3</sup>. The external surface of the test rig shall be clad in sheet steel with a thickness of around 2 mm.

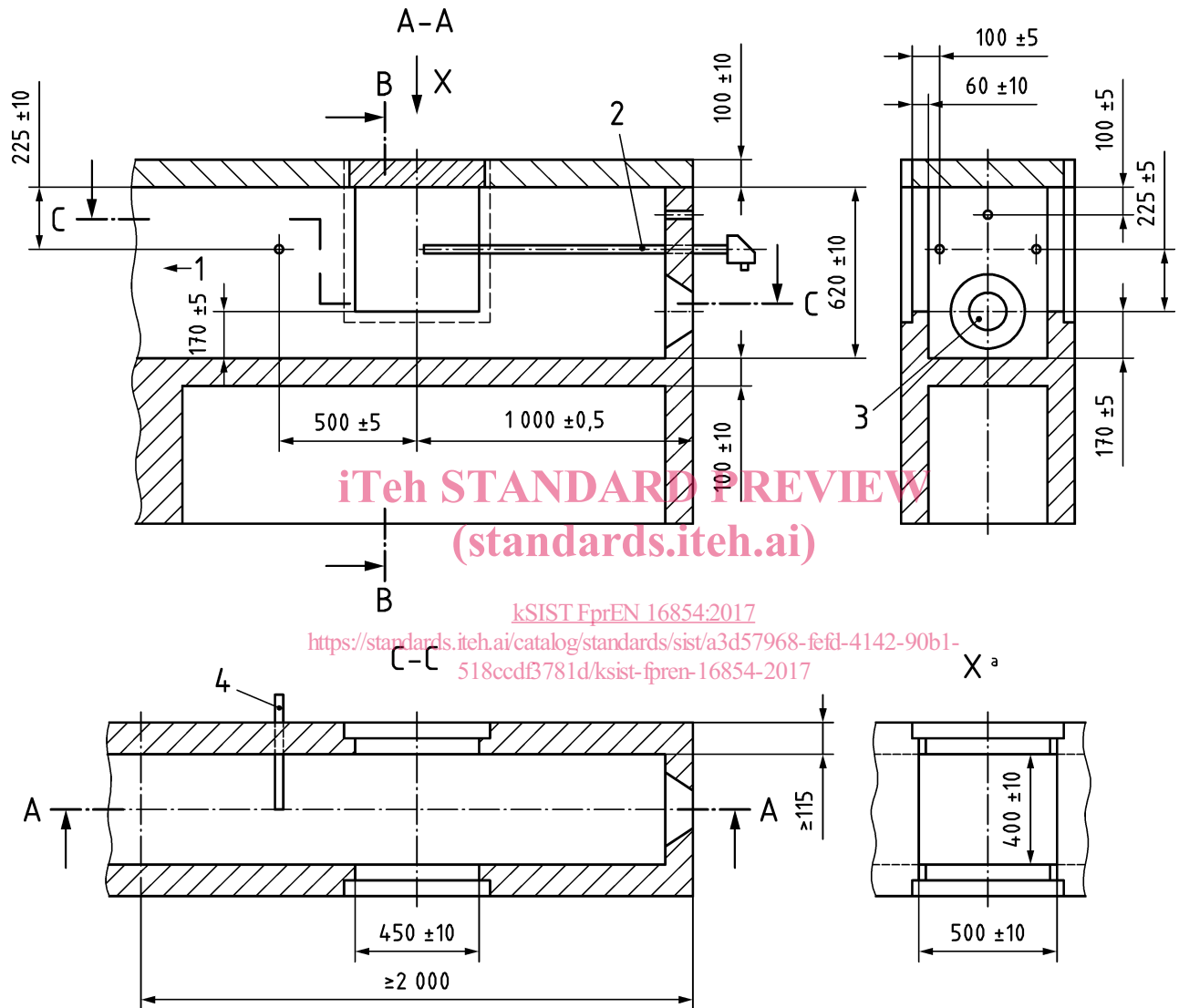
Each of the long walls and the ceiling may feature a single opening to accommodate the test specimen. A maximum of two closable observation openings, each with a maximum clear area of 100 cm<sup>2</sup>, are permitted.

The exhaust gases shall be conveyed in such a way that an excess pressure of up to 12 Pa compared with the test room can be achieved and maintained in the fire box after the first five minutes of the test.

5.2 Burner

The burner shall be an atomizing oil burner capable of generating a continuous flame. The room temperature in the test room shall not drop below 15 °C or exceed 25 °C for a period of at least 24 h prior to the fire test. The burner shall be fuelled with heating oil or diesel fuel in accordance with EN 590.

Dimensions in millimetres  
B-B



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Key

- 1 to smoke extractor with butterfly valve
- 2 mantle thermocouple
- 3 burner opening
- 4 pressure measuring point with internal diameter (15 ± 5) mm

<sup>a</sup> The ceiling slab and the thermocouples are not shown in view X.

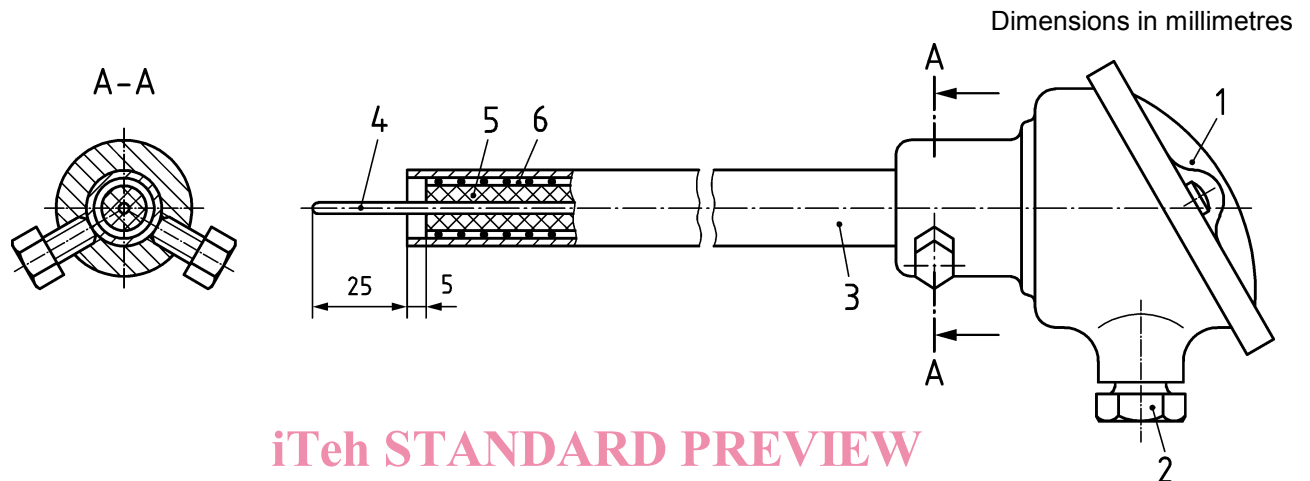
Figure 1 — Test furnace with example of arrangement of thermocouples



### 5.3 Measuring equipment

A thermocouple with a closed protective shield, an external diameter of 3 mm and a protective tube as shown in Figure 2 shall be used to measure the temperature in the fire box. The protective shield and tube shall be made of steel that is resistant to scaling. The thermocouple shall be introduced into the fire box in such a way that its junction is  $(100 \pm 5)$  mm from the centre of the surface of the test specimen. A steel pipe with an internal diameter of  $(15 \pm 5)$  mm shall be used to measure the static pressure in the fire box. The pipe shall be placed as shown in Figure 1, sections A-A and C-C.

NOTE Not given there.



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#### Key

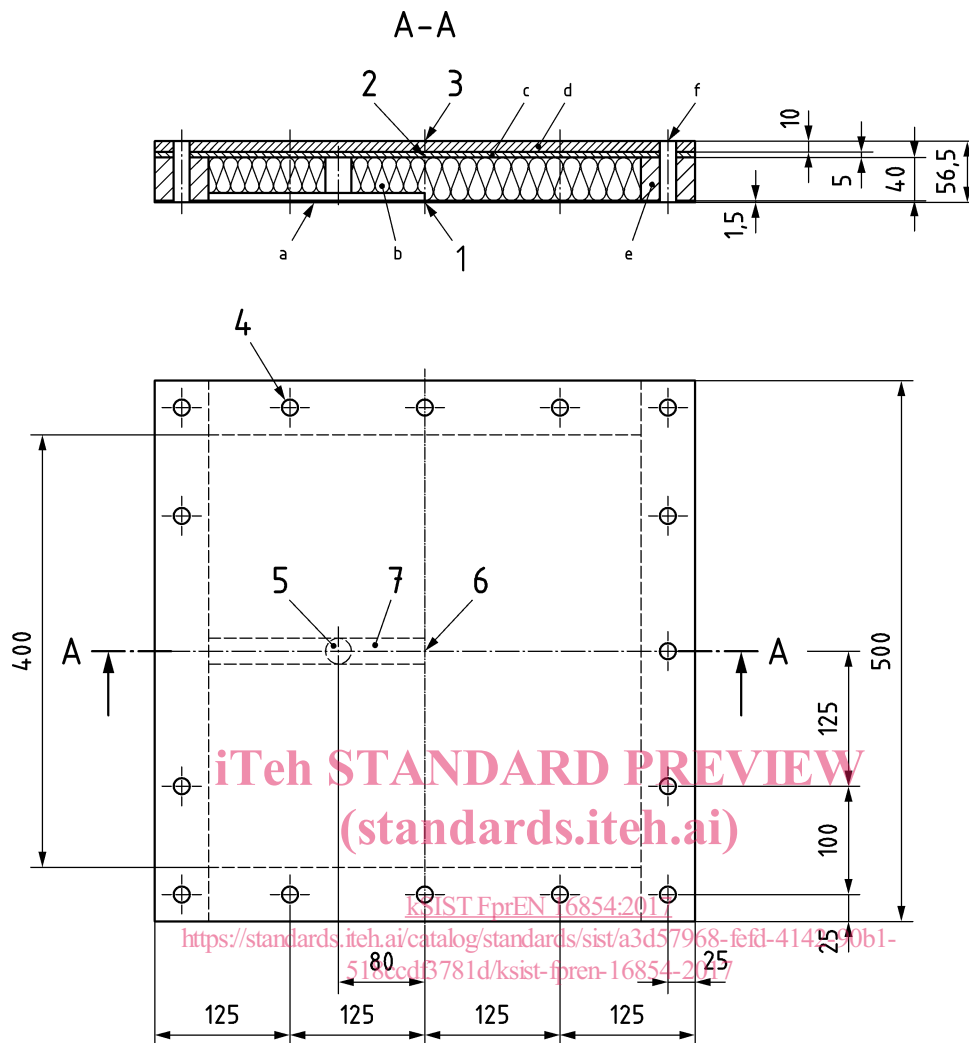
- |   |                          |   |  |
|---|--------------------------|---|--|
| 1 | connecting head, shape A | 4 | thermocouple wires isolated from protective covering   |
| 2 | threaded insert          | 5 | insulating pipe, external diameter 16 mm, inside diameter 5 mm, length 100 mm, made of ceramic insulating material |
| 3 | protective pipe          | 6 | braided mineral fibre cable  |

Figure 2 — Measuring equipment

### 6 Test specimens

Two specimens with the dimensions shown in Figure 3 shall be prepared for testing the durability of the thermal insulation property. The specimens shall be unpacked and conditioned in a dry room for at least 7 days immediately prior to testing and subsequently dried at  $105\text{ °C}$  until constant mass is achieved. Specimens used for testing flat insulation materials shall be cut out of insulation slabs as supplied. Specimens used for testing cylindrical insulation materials with a concentric layer of fibres shall be prepared from the resinated (uncured) raw wool. Specimens used for testing cylindrical insulation materials with a turbulent layer of fibres shall be prepared from the flat preliminary product. Specimens used for testing granular insulation materials shall be placed in accordance with the manufacturer's method. To this end, the spacer is removed on one side of the testing device, the granular material poured in and the spacer subsequently replaced. The density of the granular material shall be determined by weighing the testing device before and after the material is poured into it.

Dimensions in millimetres

**Key**

- |   |   |   |
|---|---|---|
| 1 | insulated thermocouple, dia. 1,6 mm   | 4 |
| 2 | thermocouples made of 0,5 mm thick wires and spot-welded to the sheet steel | 5 |
| 3 | thermocouples made of 0,5 mm thick wire                                     | 6 |
|   |   | 7 |

Countersunk screw M5 × 70

Ceramic pipe with two drilled holes

Measuring locations 1 to 3

Recess for measurement cable

Section A-B

Side facing fire box

- |   |  |   |   |
|---|--|---|---|
| a | sheet steel, 1,5 mm × 500 mm × 500 mm                | d | calcium silicate slab, 10 mm × 500 mm × 500 mm, density around 850 kg/m <sup>3</sup>    |
| b | thermal insulation material, 40 mm × 400 mm × 400 mm | e | spacers, 50 mm wide and 40 mm thick, made of hydraulically bound exfoliated vermiculite |
| c | sheet steel, 5 mm × 500 mm × 500 mm                  | f | countersunk screws M5 × 70  |

**Figure 3 — Test specimens**