

SLOVENSKI STANDARD
SIST EN 3844-3:2019**01-november-2019****Nadomešča:****SIST EN 3844-3:2012**

Aeronavtika - Vnetljivost nekovinskih materialov - 3. del: Preskus majhnih gorilnikov, 45° - Ugotavljanje odpornosti materiala proti širjenju ognja in tlenju ter pregorevanju

Aerospace series - Flammability of non metallic materials - Part 3: Small burner test, 45° - Determination of the resistance of material to flame and glow propagation and to flame penetration

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Luft- und Raumfahrt - Entflammbarkeit nichtmetallischer Werkstoffe - Teil 3: Kleinbrenner-Prüfung, 45° - Bestimmung der Beständigkeit eines Materials gegen die Ausbreitung von Flammen und Glimmen und gegen Durchbrennen

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Série aérospatiale - Inflammabilité des matériaux non métalliques - Partie 3 : Essai au brûleur, 45° - Détermination de la résistance du matériau à la propagation de la flamme et de l'incandescence, et à la pénétration de la flamme

Ta slovenski standard je istoveten z: EN 3844-3:2019**ICS:**

13.220.40	Sposobnost vžiga in obnašanje materialov in proizvodov pri gorenju	Ignitability and burning behaviour of materials and products
49.025.15	Neželezove zlitine na splošno	Non-ferrous alloys in general

SIST EN 3844-3:2019**en,fr,de**

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EUROPEAN STANDARD

EN 3844-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2019

ICS 49.025.15

Supersedes EN 3844-3:2011

English Version

Aerospace series - Flammability of non-metallic materials - Part 3: Small burner test, 45° - Determination of the resistance of material to flame and glow propagation and to flame penetration

Série aérospatiale - Inflammabilité des matériaux non
métalliques - Partie 3 : Essai au brûleur, 45° -
Détermination de la résistance du matériau à la
propagation de la flamme et de l'incandescence, et à la
pénétration de la flamme

Luft- und Raumfahrt - Entflammbarkeit
nichtmetallischer Werkstoffe - Teil 3: Kleinbrenner-
Prüfung, 45° - Bestimmung der Beständigkeit eines
Materials gegen die Ausbreitung von Flammen und
Glimmen und gegen Durchbrennen

This European Standard was approved by CEN on 12 May 2019.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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[baa1353ba5a4/sist-en-3844-3-2019](https://standards.iteh.ai/catalog/standards/sist/b438ee93-34e2-4d12-8a02-baa1353ba5a4/sist-en-3844-3-2019)

European foreword

This document (EN 3844-3:2019) has been prepared by the Aerospace and Defence Industries Association of Europe — Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2020, and conflicting national standards shall be withdrawn at the latest by February 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 3844-3:2011.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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EN 3844-3:2019 (E)**1 Scope**

This document specifies the test for the determination of the resistance of non-metallic materials in part or in whole to flame and glow propagation and to flame penetration.

This test method is also used for testing non-metallic materials which have to meet the test criteria for the 45° Bunsen burner test.

It is used for evaluation of non-metallic materials or constructions used in the interiors of aerospace vehicles but also may be used in other applications as specified in applicable procurement and regulatory documents.

This standard should be used to measure and describe the properties of non-metallic materials, products or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use.

2 Normative references

The following documents are referred to in the 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.

ASTM-D 5025, *Standard Specification for Laboratory Burner Used for Small-Scale Burning Tests on Plastic Materials* ¹⁾

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3 Terms and definitions

<https://standards.iteh.ai/catalog/standards/sist/b438ee93-34e2-4d12-8a02-baa1353ba5a4/sist-en-3844-3-2019>

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1**time of flame application**

length of time the burner flame is applied to the specimen

3.2**after flame time**

time in seconds for which the specimen continues to flame after the burner flame has been removed from the specimen

Note 1 to entry: The time is expressed in seconds.

¹⁾ Published by: ASTM National (US) American Society for Testing and Materials <http://www.astm.org/>.

3.3**after glow time**

length of time in seconds for which the specimen continues to glow, without flaming combustion, after any flaming combustion ceases following the removal of flame application

Note 1 to entry: The time is expressed in seconds.

3.4**flame penetration**

flame penetration occurs if the Bunsen burner flame penetrates (passes through) the test specimen during the time of flame application

Note 1 to entry: Flame penetration is defined to have occurred if the burner flame passes through a hole or crack in the specimen that forms during the test. Flaming combustion on the top of the specimen that results from auto ignition is not considered flame penetration in this test.

4 Principle of method

Testing is performed on a specimen that is held at an angle of 45° to the horizontal plane. A burner flame, having defined parameters, is applied to the specimen for a defined period of time. The after flame time, after removal of the burner flame, and the after glow time is measured. Flame penetration is reported.

5 Designation

EXAMPLE

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Description block	Identity block
SIST EN 3844-3:2019 45° BUNSEN BURNER TEST	EN3844-3

Number of this standard _____

6 Test apparatus**6.1 Test cabinet**

Tests shall be conducted in a draught-free cabinet, like shown in Figure 1 or other equivalent enclosures. Details and dimensions of a suitable test cabinet are given in Figure 2.

Cabinets of bigger dimensions may be used if it has been proven that similar results are obtained.

1 mm thick metal sheet shall be used for the bottom surface of the cabinet.

It is recommended to paint the entire inside back walls of the cabinet mat black to facilitate the viewing of the test specimen. A mirror may be located on the inside back surface to facilitate observation of the hidden surface.

It is suggested that the cabinet be located inside an exhaust hood to facilitate clearing the cabinet of smoke and fumes after each test.

EN 3844-3:2019 (E)**6.2 Specimen holder**

A specimen holder shall be provided, such that the minimum exposed area of the specimen is 200 mm × 200 mm.

The specimen holder shall be fabricated of corrosion-resistant metal.

An example for a construction is given in Figure 3.

6.3 Burner**6.3.1 Burner type**

The burner shall be a Bunsen or Tirril type, have a 9,5 mm inside diameter barrel, and shall be equipped with a needle valve to adjust the gas flow rate and thereby adjust the flame height.

The burner shall have no air supplied either directly or by aspiration. The Bunsen burner defined in ASTM-D 5025 has been found acceptable.

6.3.2 Burner fuel

Methane gas shall be used as burner fuel. Natural gas is also acceptable if it contains more than 90 % methane.

6.3.3 Plumbing for gas supply

The necessary gas connections and the applicable plumbing shall be essentially as specified in Figure 4. A control valve system with a delivery rate designed to furnish gas to the burner under a pressure of (17 ± 2) kPa at the burner inlet shall be installed between the gas supply and the burner.

6.3.4 Flame height indicator

There may be a flame height indicator spaced 25 mm from the burner barrel and extending above the burner, as shown in Figure 5. The indicator may have two prongs, 8 mm in length, marking the distances, 22 mm and 38 mm above the top of the burner. When the flame is properly adjusted, then the tip of the flame shall be at the 38 mm prong and for pure methane the tip of the inner cone of the flame will be at the 22 mm prong. The flame height indicator may be removable.

6.3.5 Flame Temperature

When the height is adjusted, measure the flame temperature with the help of a calibrated temperature measurement device and an allocated thermocouple (Type K, \emptyset 1,5 mm). The tip of the thermocouple shall be completely in the flame. The flame temperature shall be at least 843 °C.

6.4 Timer

One or more stop-watches or other timers, calibrated and graduated to the nearest 0,1 s, shall be used to measure the time of the flame application and the after flame and after glow time.

7 Test specimens**7.1 Number of specimens**

At least three specimens shall be prepared and tested.

7.2 Specimens size

The specimen shall be a square of at least 220 mm × 220 mm.

8 Conditioning

Condition specimens at (23 ± 2) °C and at (50 ± 5) % relative humidity for min. 24 h. Remove only one specimen at a time from the conditioning environment immediately before being tested.

9 Burner adjustment

- a) Assure that the air supply to the burner is shut off.
- b) Open the stopcock in the gas line fully.
- c) Light the burner.
- d) Adjust the gas flowrate to produce a flame height of 38 mm.

10 Test procedure

Make sure that the test cabinet is essentially draught free.

Assure that the specimen is mounted in the frame so that the edges are held securely. The exposed surface of the specimen, defined in the test specification shall be faced down.

Place the burner at least 76 mm away from where the specimen will be located during the test.

Insert the specimen into the test position.

Close the cabinet door, and keep it closed during the test.

Place the burner, so that the centre of the burner barrel is under and 25 mm away from the centre of the exposed surface of the specimen, see Figure 6.

Start the timer as soon as the burner is in test position.

Apply the flame for 30 s, then withdraw the burner by moving the burner into start position.

Determine the after flame time and the after glow time for the specimen to the nearest 0,2 s.

Determine whether flame penetration occurred.

After both flaming and glowing have ceased:

- a) open the cabinet door slowly to clear the test cabinet of fumes and smoke;
- b) remove the specimen.

Remove any material from the bottom of the cabinet that fell from the specimen. If necessary, clean the test cabinet window prior to testing the next specimen.