



SLOVENSKI STANDARD

SIST EN 3844-2:2019

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Nadomešča:

SIST EN 3844-2:2012

Aeronavtika - Vnetljivost nekovinskih materialov - 2. del: Preskus majhnih gorilnikov, vodoravni - Ugotavljanje vodoravnega širjenja ognja

Aerospace series - Flammability of non metallic materials - Part 2: Small burner test, horizontal - Determination of the horizontal flame propagation

Luft- und Raumfahrt - Entflammbarkeit nichtmetallischer Werkstoffe - Teil 2: Kleinbrenner-Prüfung, waagrecht - Bestimmung der waagerechten Flammenausbreitung

Série aérospatiale - Inflammabilité des matériaux non métalliques - Partie 2 : Essai au brûleur, horizontal - Détermination de la propagation horizontale de la flamme

Ta slovenski standard je istoveten z: EN 3844-2:2019

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

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en,fr,de

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EUROPEAN STANDARD

EN 3844-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2019

ICS 49.025.15

Supersedes EN 3844-2:2011

English Version

Aerospace series - Flammability of non-metallic materials - Part 2: Small burner test, horizontal - Determination of the horizontal flame propagation

Série aérospatiale - Inflammabilité des matériaux non
métalliques - Partie 2 : Essai au brûleur, horizontal -
Détermination de la propagation horizontale de la
flamme

Luft- und Raumfahrt - Entflammbarkeit
nichtmetallischer Werkstoffe - Teil 2: Kleinbrenner-
Prüfung, waagrecht - Bestimmung der waagerechten
Flammenausbreitung

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

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European foreword

This document (EN 3844-2:2019) 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 3844-2:2011.

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 3844-2:2019 (E)**1 Scope**

This document specifies the test method for the determination of the horizontal flame propagation of non-metallic materials when subjected to a small flame in part or in whole.

This test method is also used for testing non-metallic materials which have to meet the test criteria for the horizontal 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⁾

3 Terms and definitions

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**flame spread rate**

distance travelled by a flame front during its propagation, per unit time, under specified test conditions

Note 1 to entry: In this test, it is the speed with which a flame front moves across a test specimen mounted horizontally. The flame spread rate is expressed in mm per minutes.

3.2**time of flame application**

length of time the burner flame is applied to the specimen

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

3.3

burn length

distance in millimetres from the original specimen edge to the farthest evidence of damage of the test specimen due to that area's combustion, including areas of partial consumption, charring, or embrittlement, but not including areas sooted, stained, warped or discoloured, nor areas where material has shrunk or melted away from the heat

4 Principle of method

Testing is performed on a specimen that is held horizontal. A burner flame, having defined parameters, is applied for 15 seconds to the specimen. The flame spread rate is calculated as a result of the measured burn length per unit time.

5 Designation

EXAMPLE

Description block	Identity block
HORIZONTAL BUNSEN BURNER TEST	EN3844-2

Number of this standard

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6 Test apparatus

6.1 Test cabinet

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Tests shall be conducted in a draught-free cabinet, as 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 for clearing the cabinet of smoke and fumes after each test.

6.2 Specimen holder

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

A specimen holder shall be provided, such that the exposed area of the specimen is at least 50 mm × 305 mm. An example for a construction is given in Figure 3.

Each of the rectangular frames must be 6,5 mm in thickness. An example for a construction is given in Figure 3.

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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

A flame indicator shall be used. A suitable indicator is shown in Figure 5. The indicator shall have two height indicators, e. g. prongs 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.

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6.3.5 Flame temperature

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When the height is adjusted, measure the flame temperature with the help of a calibrated temperature measurement device and an allocated thermocouple (Type K, \varnothing 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 flame application and the time of the specimen burning.

6.5 Ruler

A ruler or a scale, calibrated and graduated to the nearest 1 mm, shall be used to measure the burn length and for specimen preparation.

7 Test specimens

7.1 Number of specimens

At least three specimens shall be prepared and tested.

7.2 Specimens orientation

For materials which may have anisotropic flammability properties (i.e. different properties in different directions, such as machine and cross-machine direction for extrusions, warp and weft for woven fabrics, etc.), the specimens shall be tested in both directions.

The values for every direction have to be averaged and reported separately.

7.3 Specimens size

The specimens shall be a rectangle of at least 75 mm × 305 mm, unless the actual size used in the aircraft is smaller.

The specimen thickness shall be no thicker than the minimum thickness to be qualified for use in the aircraft. The specimen thickness will not exceed 3 mm.

7.4 Specimens preparation

Mark gauge lines on the back surface (opposite the exposed surface) of the specimen as shown in Figure 6.

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 (standards.iteh.ai)

- a) Assure that the air supply to the burner is shut off.
<https://standards.iteh.ai/catalog/standards/sist/86e30d5a-c9a6-4b7c-9a4b-5cf0/sist-en-3844-2-2019>
- b) Open the stopcock in the gas line fully.
<https://standards.iteh.ai/catalog/standards/sist/86e30d5a-c9a6-4b7c-9a4b-5cf0/sist-en-3844-2-2019>
- 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.

Place the burner at least 76 mm away from the test position.

Mount the specimen into the specimen holder so that the clamped edges are held securely. One short edge of the specimen has to be flush with the open end of the specimen holder.

The exposed surface of the specimen, defined in the test specification shall be face down.

Insert the holder with the specimen into the cabinet.

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

Assure that the lower edge of the specimen is 19 mm above the level of the top of the burner.