SLOVENSKI STANDARD
SIST EN 3844-3:2012

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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

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

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 flammes

Ta slovenski standard je istoveten z: **EN 3844-3:2011**

ICS:

13.220.99	Drugi standardi v zvezi z varstvom pred požarom	Other standards related to protection against fire
49.025.99	Drugi materiali	Other materials

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EUROPEAN STANDARD

NORME EUROPÉENNE

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EN 3844-3

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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

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Foreword

This document (EN 3844-3:2011) 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of an identical text or by endorsement, at the latest by May 2012, and conflicting national standards shall be withdrawn at the latest by May 2012.

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

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1 Scope

This European Standard specifies the test for the determination of the resistance of non metallic materials 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 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 referenced documents are indispensable for the application 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, *A laboratory burner used for small-scale burning test on plastic materials* [1)]

3 Terms and definitions

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

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

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

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 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.

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

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

Description block	Identity block
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, as shown in Figure 1. Details and dimensions of the test cabinet are given in Figure 2.

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.

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

6.2 Specimen holder

A specimen holder shall be provided, such that the exposed area of the specimen is 203 mm × 203 mm.

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

Each of the rectangular frames shall be at least 2 mm in thickness. 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

Bottled 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 at least 5 kPa at the burner inlet shall be installed between the gas supply and the burner.

6.3.4 Flame height indicator

There shall be a flame height indicator spaced 25 mm from the burner barrel and extending above the burner, as shown in Figure 5. The indicator shall 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 shall be removable.

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

— Assure that the air supply to the burner is shut off.

— Open the stopcock in the gas line fully.

— Light the burner.

— 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 1 s.

Determine whether flame penetration occurred.

After both flaming and glowing have ceased:

— open the cabinet door slowly to clear the test cabinet of fumes and smoke;

— 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.

11 Report

The test report shall include the following data:

— complete description of the specimen material and specimen construction (material designation, manufacturer's identification, manufacturing number, construction, specimen thickness, density, etc.);

— manufacturer/supplier and order number;

— statement of conformity given by the quality assurance of specimen manufacturer;

— designation of the test method;

— the after flame time for each specimen tested and the average value;

— the after glow time for each specimen tested to the nearest 1 s and the average value;

— a statement if flame penetration occurred;

— observations about melting, sagging, delamination, or other behaviour that affected the exposed surface area or mode of burning occurred, and the time in seconds at which such behaviour occurred;

— changes in test procedure required by the test specification;

— name and address of the test laboratory/organisation;

— date of testing;

— operator's name and signature of the responsible engineer.