



SLOVENSKI STANDARD
SIST EN 3475-407:2004
01-maj-2004

Aerospace series - Cable, electrical, aircraft use - Test methods - Part 407: Flammability

Aerospace series - Cable, electrical, aircraft use - Test methods - Part 407: Flammability

Luft- und Raumfahrt - Elektrische Leitungen für Luftfahrt, Verwendung - Prüfverfahren - Teil 407: Entflammbarkeit

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Série aérospatiale - Câbles électriques à usage aéronautique - Méthodes d'essais - Partie 407 : Tenue a la flamme

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Ta slovenski standard je istoveten z: EN 3475-407:2002

ICS:

49.060 Štejni sistemi in oprema za letalstvo in zrakoplovstvo Aerospace electric equipment and systems

SIST EN 3475-407:2004 en

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EUROPEAN STANDARD
NORME EUROPÉENNE
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ICS 13.220.40; 49.060

English version

Aerospace series - Cables, electrical, aircraft use - Test methods - Part 407: Flammability

Série aérospatiale - Câbles électriques à usage
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Verwendung - Prüfverfahren - Teil 407: Entflammbarkeit

This European Standard was approved by CEN on 6 August 2001.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Foreword

This document (EN 3475-407:2002) has been prepared by the European Association of Aerospace Manufacturers (AECMA).

After inquiries 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 AECMA, prior to its presentation to CEN.

This European Standard shall be given the status of a national standards, either by publication of an identical text or by endorsement, at the latest by August 2002, and conflicting national standards shall be withdrawn at the latest by August 2002.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This standard specifies two methods of determining the flammability characteristics of a finished cable. It shall be used together with EN 3475-100.

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 3475-100 Aerospace series – Cables, electrical, aircraft use – Test methods – Part 100: General

3 Equipment

The following equipment shall be required for these tests :

a) **Test chamber:** this shall be a chamber measuring not less than 700 mm high × 500 mm wide × 300 mm deep, enclosed at the top, open at the front and situated in a draught-free environment but with sufficient air supply to provide normal combustion. General arrangements are shown in figures 1 and 2.

b) **Bunsen type gas burner:** the burner shall have a 6 mm inlet, a needle valve in the base for gas adjustment, a nominal bore of 9 mm and a barrel of approximately 100 mm above the air inlets. The gas supply shall be capable of achieving the test requirements defined in 4.1.2 and 4.2.2.

WARNING NOTE: Care should be exercised in setting up and performing this test as toxic fumes may be given off during combustion. The test chamber shall be placed in a fume cabinet that will allow evacuation of gaseous products of combustion at the end of the test.

4 Procedures

4.1 Method 1

4.1.1 Preparation of test specimens

Cut three specimens, approximately 900 mm in length, consecutively from the same coil. Strip each end and place them in an atmosphere of (50 ± 5) % relative humidity at a temperature of (21 ± 3) °C for a period of not less than 24 h. Keep the specimens in the conditioning area until just prior to testing.

4.1.2 Flame temperature

4.1.2.1 Adjust the Bunsen burner to produce a flame with an inner blue cone approximately one-third of the overall flame height. Insert a bare copper wire of $(0,7 \pm 0,025)$ mm diameter, and having a free length of not less than 100 mm, into the flame, the end of the wire being immediately above the tip of the inner cone.

NOTE For initial setting-up purposes, an overall flame height of approximately 75 mm may be found suitable.

4.1.2.2 Adjust the burner so that the wire starts to melt within 4 s to 6 s of being inserted into the flame.

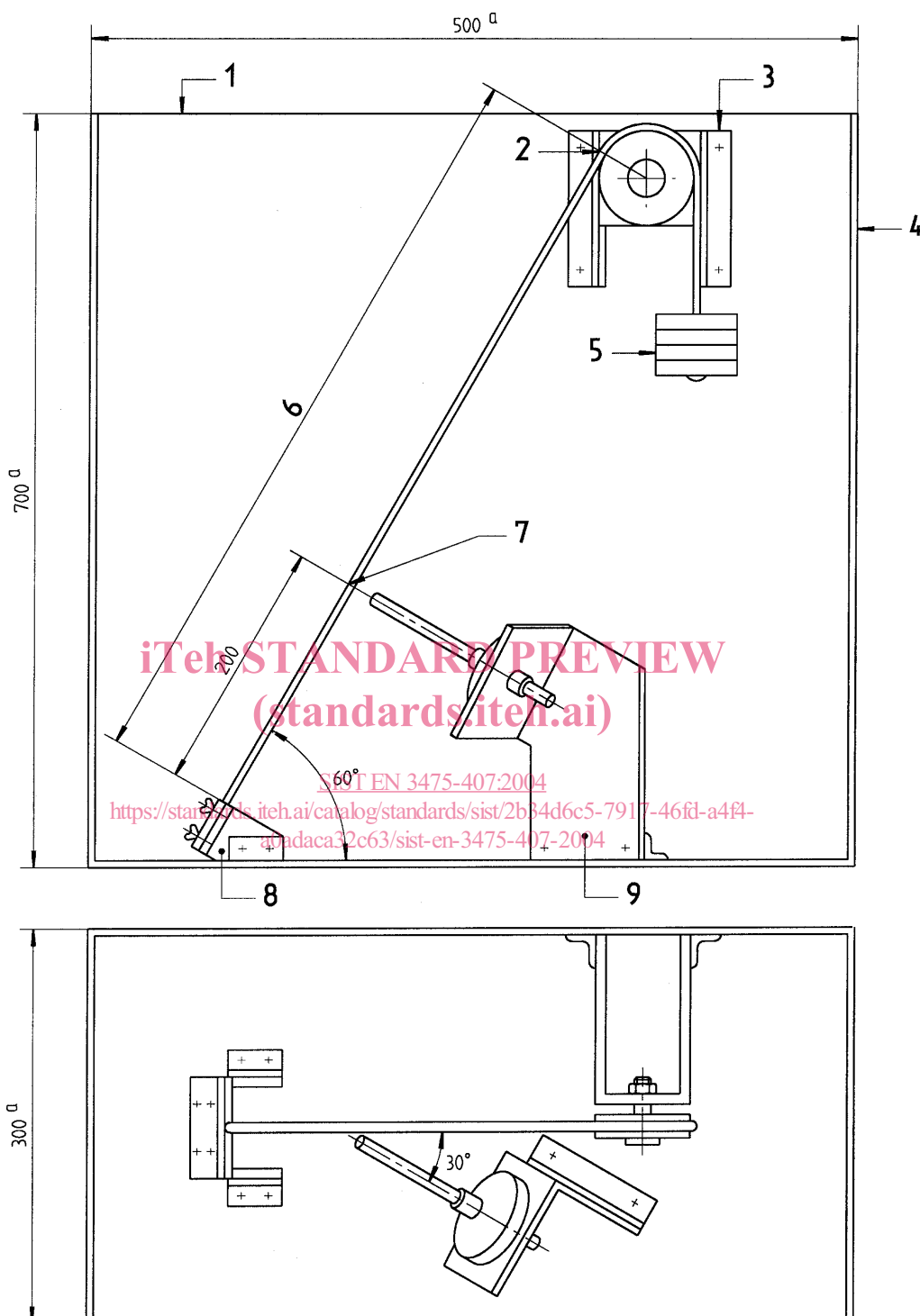
NOTE Alternatively for 4.1.2.1 and 4.1.2.2, a 0,8 mm to 0,81 mm diameter wire may be used in which case adjust the burner so that the wire starts to melt within 7 s to 9 s.

4.1.3 Mounting configuration

4.1.3.1 Mount the specimen in the test chamber as shown in figure 1 at an angle of (60 ± 2) ° to the horizontal, parallel to, and approximately 150 mm from the front end of the test chamber. Clamp the conductor at the bottom of the apparatus. Pass the cable over the upper pulley and attach it to a weight which is just sufficient to keep the specimen straight within the test zone.

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EN 3475-407:2002 (E)
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**Key**

- | | | | |
|---|---|---|--|
| 1 | Box construction aluminium alloy 3,15 mm | 6 | 600 - Distance between reference marks |
| 2 | Upper datum point | 7 | Flame application point (flame centre datum) |
| 3 | Pulley support bracket (low thermal conductivity) | 8 | Bottom clamp support (low thermal conductivity) |
| 4 | Support frame open at front | 9 | Bunsen burner support (low thermal conductivity) |
| 5 | Weights as required | | |

^a approx.

Figure 1

EN 3475-407:2002 (E)

4.1.3.2 Make a mark 200 mm above the lower clamp point and position the burner in the plane of this mark, perpendicular to the specimen and directed towards the specimen at an angle of 30° to the vertical plane as shown in figure 1, i.e. at 90° to the axis of the cable such that the flame will impinge directly onto the 200 mm mark.

4.1.3.3 Set the distance of the burner from the specimen such that the tip of the inner cone of the flame is immediately below the specimen.

4.1.4 Flame application

Apply the flame to the specimen for a period of 15 s and then immediately remove the burner. Make a second test for a period of 30 s.

4.2 Method 2**4.2.1 Preparation of test specimens**

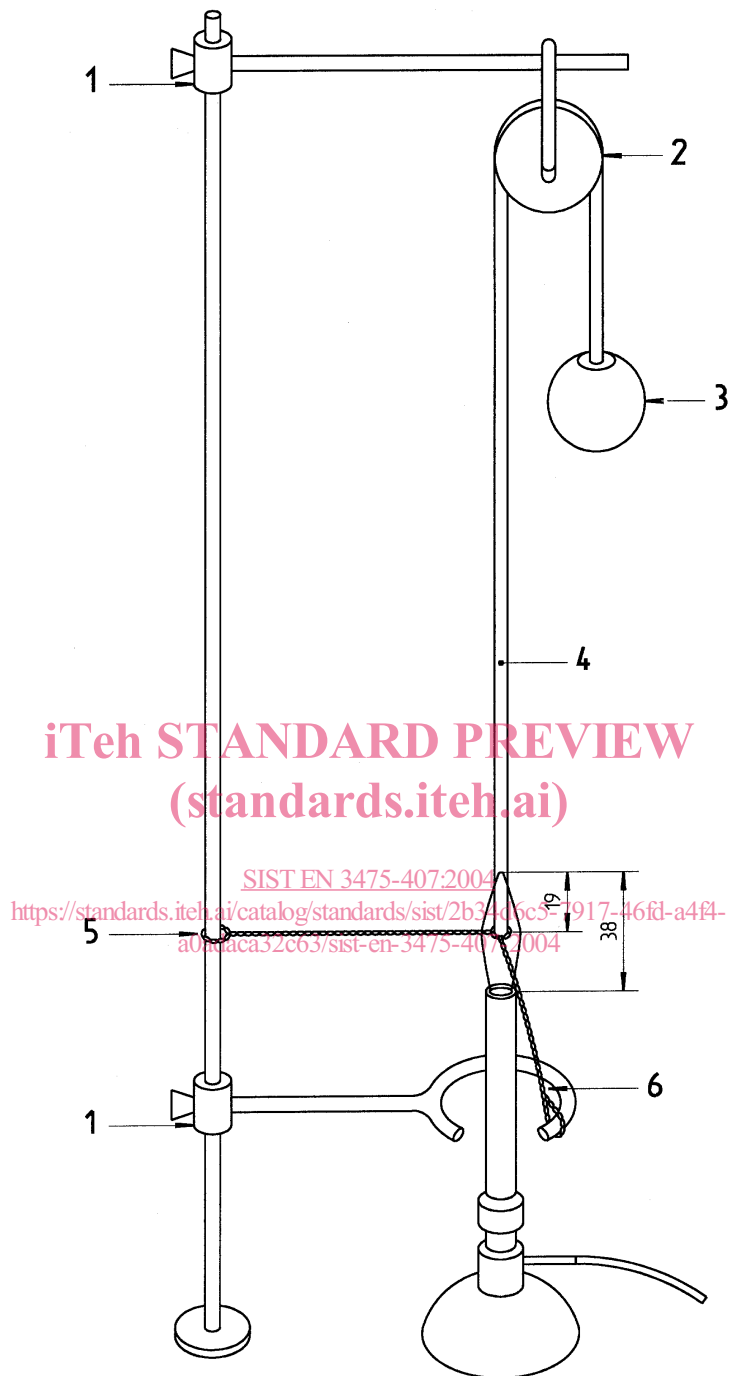
Cut three specimens, approximately 450 mm in length, consecutively from the same coil. Strip each end and place them in an atmosphere of (50 ± 5) % relative humidity at a temperature of (21 ± 3) °C for a period of not less than 24 h. Keep the specimens in the conditioning area until just prior to testing. Remove 50 mm of insulation from one end of the specimen and mount it as shown in figure 2.

4.2.2 Flame temperature

Adjust the Bunsen burner to produce a 38 mm high soft yellow flame.

4.2.3 Mounting configuration

Mount the specimen vertically in the test chamber as shown in figure 2. Fix the lower end of the conductor to the support bar and apply the fine wire to the conductor at the junction with the insulation. Pass the cable over the upper pulley and attach it to a weight which is just sufficient to keep the specimen straight within the test zone.

**Key**

- | | | | |
|---|--------|---|--------------------------|
| 1 | Clamp | 4 | Specimen |
| 2 | Pulley | 5 | Fine wire |
| 3 | Weight | 6 | Stripped conductor 50 mm |

Figure 2

Apply the 38 mm high yellow flame from the Bunsen burner to the specimen at the junction of the insulation and the bare conductor in such a manner that the lower end of the insulation is located half-way (19 mm) into the flame as shown in figure 2.

4.2.4 Flame application

Apply the flame to the specimen for a period of 15 s and then immediately remove the burner.