
Aeronavtika - Električni kabli, namestitve - Zaščitne obojke - Preskusne metode - 309. del: Požarna odpornost pri vgradnji kablov

Aerospace series - Electrical cables, installation - Protection sleeves - Test methods - Part 309: Fire resistance when fitted on a cable bundle

Luft- und Raumfahrt - Elektrische Leitungen, Installation - Schutzschläuche - Prüfverfahren - Teil 309: Feuerbeständigkeit wenn um Kabelbündel installiert

Série aérospatiale - Câbles électriques, installation - Gaines de protection - Méthodes d'essais - Partie 309 : Résistance au feu une fois installée sur un toron de câbles

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Ta slovenski standard je istoveten z: EN 6059-309:2018

ICS:

13.220.40	Sposobnost vžiga in obnašanje materialov in proizvodov pri gorenju	Ignitability and burning behaviour of materials and products
29.060.20	Kabli	Cables
49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems

SIST EN 6059-309:2018

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 6059-309

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ICS 13.220.40; 49.060

English Version

**Aerospace series - Electrical cables, installation -
Protection sleeves - Test methods - Part 309: Fire
resistance when fitted on a cable bundle**

Série aérospatiale - Câbles électriques, installation -
Gaines de protection - Méthodes d'essais - Partie 309 :
Résistance au feu une fois installée sur un toron des
câbles

Luft- und Raumfahrt - Elektrische Leitungen,
Installation - Schutzschläuche - Prüfverfahren - Teil
309: Feuerbeständigkeit wenn um Kabelbündel
installiert

This European Standard was approved by CEN on 6 November 2017.

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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.

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

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European foreword

This document (EN 6059-309:2018) 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 2019, and conflicting national standards shall be withdrawn at the latest by February 2019.

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.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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EN 6059-309:2018 (E)

1 Scope

This European Standard specifies a method of testing the fire resistance of wire harnesses protected with fire resistant sleeve for aerospace application.

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.

EN 3909, *Aerospace series — Test fluids and test methods for electrical and optical components and sub-assemblies*

ISO 2685:1998, *Aircraft — Environmental test procedure for airborne equipment — Resistance to fire in designated fire zones*

3 Terms and definitions

No terms and definitions are listed in this document.

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>

4 Specimen composition

Standard cable = Type of non-fire proof/resistant cables, shall be in accordance with the product standard.

Fire resistant electrical harness built with non-fire resistant wires protected by a fire resistant external envelope.

Standard bundle:

- A. Bundle Figure 1 shall be made at least with twisted pairs AWG24 and jacketed shielded twisted pairs AWG24 standard cables. The bundle diameter shall be less than or equal to 10 mm. Bundle shall be twisted with a maximum twisting pitch of twice diameter of the burner. The fireproof external envelope shall be installed in accordance with the installation specification.

Other bundles if requested:

- B. Bundle shall be made at least with twisted pairs AWG24 and shielded twisted pairs AWG24 standard cables in external position of the bundle. The bundle diameter shall be greater than or equal to 20 mm. The fireproof external envelope shall be installed in accordance with its installation specification.
- C. Bundle with specific cables or specific composition. Specific cables shall face the burner. Bundle shall be twisted with a minimum twisting pitch of 300 mm or twice the bundle diameter. The fireproof external envelope shall be installed in accordance with its installation specification.
- D. Bundle with shield. The fireproof external envelope shall be installed in accordance with its installation specification.

5 Preparation of specimens

5.1 Equipotentials

Preparation of the equipotentials

The conductors of the same equipotential shall be short-circuited at the extremity (conductors in parallel). See Figure 2.

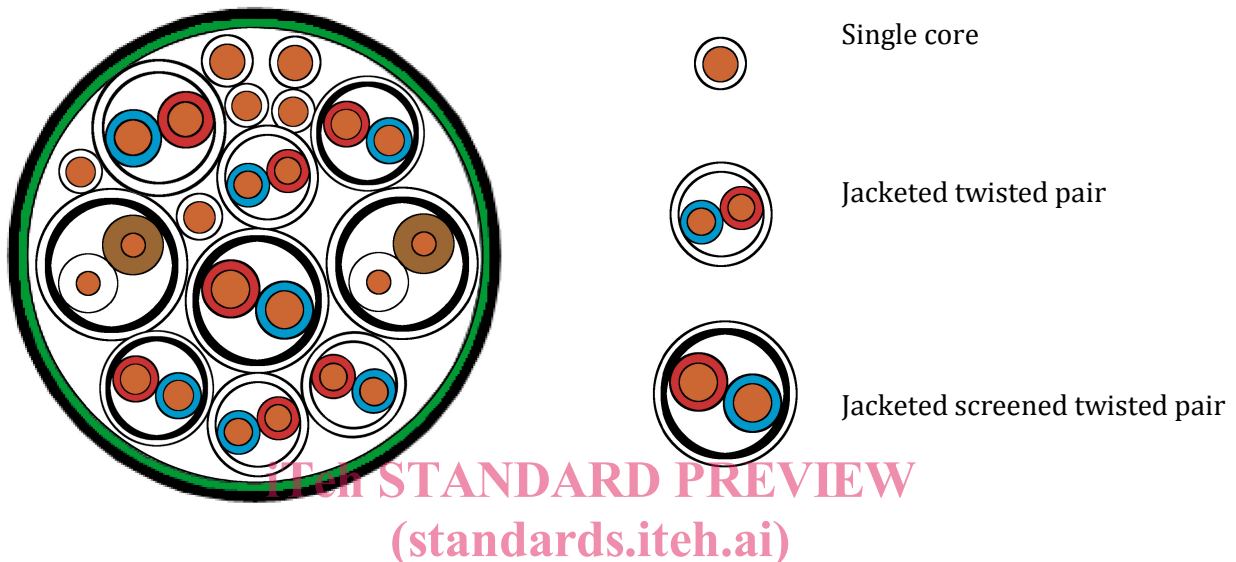


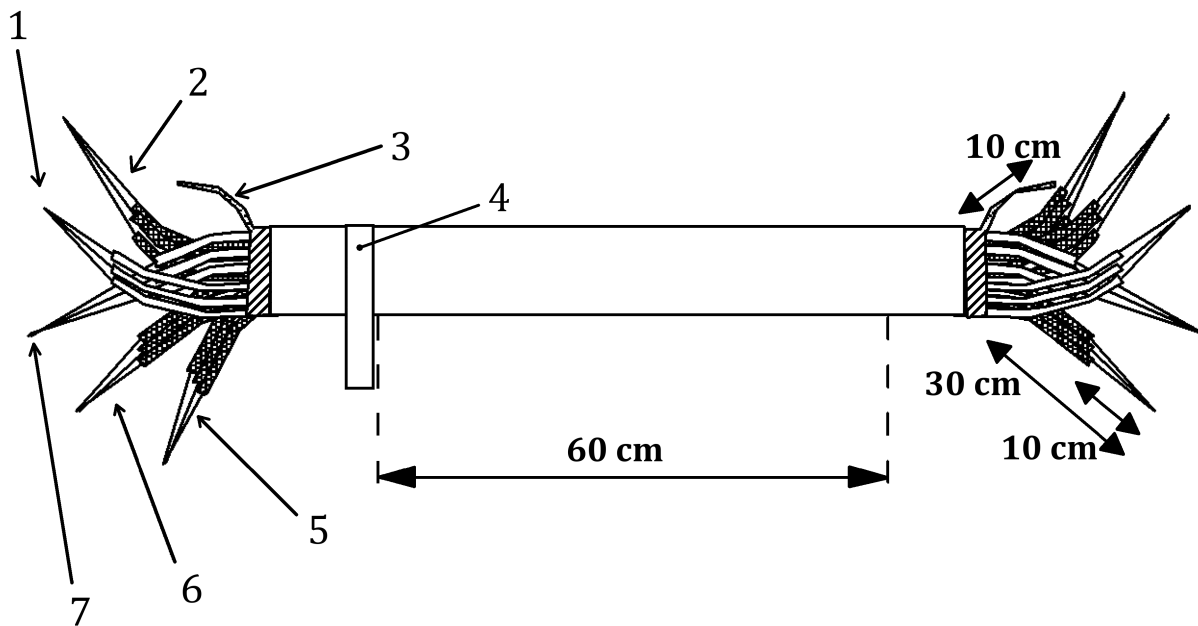
Figure 1 — Typical standard A bundle

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- Equipotential 1 = Half chosen at random of the single core cables (if applicable) and the red wires of the non-shielded pairs.
 - Equipotential 2 = The other half of the single core cables (if applicable) and all the left wires of the non-shielded pairs.
 - Equipotential 3 = All the single core cables (if applicable) and red wires of the shielded pairs.
 - Equipotential 4 = One core of the specific cables (if applicable) or else all the left wires of the shielded pairs.
 - Equipotential 5 = The left core of the specific cables (if applicable).
 - Equipotential 6 = External and individual shields.

5.2 Dimensions

See Figure 2.



Key

- 1 Equipotential 2
- 2 Equipotential 1
- 3 Equipotential 6
- 4 Identification
- 5 Equipotential 3
- 6 Equipotential 4
- 7 Equipotential 5

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Figure 2 — Typical bundle configuration

5.3 Number of specimens

Specimens for test without conditioning:

- One (1) straight specimen (type A);
- One (1) specimen of each bundle types B, C and/or D as specified in the product standard.

Specimens for test with conditioning:

- One (1) straight specimen (Type A) per fluid.

6 Apparatus

6.1 List of apparatus

The following shall be required for this test: a burner, a test fixture, and test fluids.

6.2 Burner

The burner shall be as described in Annex A of ISO 2685:1998 (6-inch gas burner).

- Specimen length exposed to the flame: 150 mm;
- Flame temperature: $1\,100\text{ °C} \pm 80\text{ °C}$ measured 75 mm above the burner;
- Heat flux density received by the calorimeter described in Annex B of ISO 2685:1998: $(116 \pm 10)\text{ kW/m}^2$.

6.3 Test fixture

Refer to Figures 3 and 4. The distance between the burner and the underside of the cable under test shall be 70 mm to 80 mm. The frame of the test fixture shall be vibrated with the following characteristics:

- Direction perpendicular to the axis of the cable;
- Frequency: $(30 \pm 5)\text{ Hz}$;
- Minimum acceleration: 4 g.

6.4 Fluids

The test fluids listed below shall be in accordance with EN 3909.

- Aircraft fuel (kerosene);
- Hydraulic fluid (phosphate base);
- Lubricant (synthetic oil).

7 Method

7.1 Conditioning

The conditioning is only applicable to the test specimens which are to be exposed to fluid contamination. At ambient temperature, the centre 300 mm section of each specimen shall be heavily soaked five times by pouring fluid over the specimen in the fluid (see Figure 3). Each soaking is to be spaced 10 min apart. After soaking the specimen shall be rested for between 16 h to 24 h, then any surplus fluid shall be removed with a lint free tissue.

7.2 Preparation

The test shall be conducted in still air.

Each sample shall be mounted onto a frame as shown in Figure 4.

Test assembly shall be adjusted so that the low side of the specimen is in the $1\,100\text{ °C}$ flame temperature zone.