
Aeronavtika - Kabli, električni, za splošne namene, z vodniki iz aluminija ali pobakrenega aluminija - 002. del: Splošno

Aerospace series - Cables, electric, general purpose, with conductors in aluminium or copper-clad aluminium - Part 002: General

Luft- und Raumfahrt - Elektrische Leitungen, für allgemeine Verwendung, mit Leitern aus Aluminium oder kupferbeschichtetem Aluminium - Teil 002: Allgemeines

Série aérospatiale - Câbles électriques, d'usage général, avec conducteurs en aluminium ou en aluminium chemisé cuivre - Partie 002: Généralités

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EUROPEAN STANDARD

EN 4681-002

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This European Standard was approved by CEN on 25 February 2012.

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Foreword

This document (EN 4681-002:2012) 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of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.

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.

According to the CEN/CENELEC Internal Regulations, the national standards organisations 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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EN 4681-002:2012 (E)**1 Scope**

This European Standard specifies the list of product standards and common characteristics of electrical cables for general purpose with conductors in aluminium or copper-clad aluminium, intended for installation in aircraft electrical systems.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 3719, *Aerospace series — Aluminium or aluminium alloy conductors for electrical cables — Product standard*

EN 3838, *Aerospace series — Requirements and tests on user-applied markings on aircraft electrical cables*

EN 4651, *Aerospace series — Copper-clad aluminium alloy conductors for electrical cables — Product standard*¹⁾

EN 4681-001, *Aerospace series — Cables, electric, general purpose, with conductors in aluminium or copper-clad aluminium — Part 001: Technical specification*

EN 4681-003, *Aerospace series — Cables, electric, general purpose, with conductors in aluminium or copper-clad aluminium — Part 003: AD family, single UV laser printable — Product standard*²⁾

EN 4681-004, *Aerospace series — Cables, electric, general purpose, with conductors in aluminium or copper-clad aluminium — Part 004: ADA family, single and multicore assembly — Product standard*²⁾

EN 4681-005, *Aerospace series — Cables, electric, general purpose, with conductors in aluminium or copper-clad aluminium — Part 005: AZ family, single UV laser printable for use in low pressure atmosphere — Product standard*²⁾

EN 4681-006, *Aerospace series — Cables, electric, general purpose, with conductors in aluminium or copper-clad aluminium — Part 006: AZA family, single and multicore assembly for use in low pressure atmosphere — Product standard*²⁾

ISO 2574, *Aircraft — Electrical cables — Identification marking*

TR 4684, *Aerospace series — Electrical Technology and component definition*²⁾

TR 6058, *Aerospace series — Cable code identification list*³⁾

1) Published as ASD-STAN Prestandard at the date of publication of this standard (www.asd-stan.org).

2) In study at the date of publication of this standard.

3) Published as ASD-STAN Technical Report at the date of publication of this standard (www.asd-stan.org).

3 Terms, definitions and symbols

For the purposes of this standard, the terms, definitions and symbols given in TR 4684 apply.

4 List of product standards

EN 4681-003, *Aerospace series — Cables, electric, general purpose, with conductors in aluminium or copper-clad aluminium — Part 003: AD family, single UV laser printable — Product standard*

EN 4681-004, *Aerospace series — Cables, electric, general purpose, with conductors in aluminium or copper-clad aluminium — Part 004: ADA family, single and multicore assembly — Product standard*

EN 4681-005, *Aerospace series — Cables, electric, general purpose, with conductors in aluminium or copper-clad aluminium — Part 005: AZ family, single UV laser printable for use in low pressure atmosphere — Product standard*

EN 4681-006, *Aerospace series — Cables, electric, general purpose, with conductors in aluminium or copper-clad aluminium — Part 006: AZA family, single and multicore assembly for use in low pressure atmosphere — Product standard*

5 Materials and construction

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5.1 Materials

These cable conductors shall be made of aluminium or copper clad aluminium and nickel-plated according to EN 3719 or EN 4651 code D (except otherwise specified in product standards).

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5.2 Construction

5.2.1 Number of cores

See Table 1.

Table 1

Number of cores	1	2	3	4	5
Code	A	B	C	D	E
Factor for overall dimensions	1	2,00	2,15	2,40	2,70

For two cores or more:

- The lay length of the outer lay shall not be less than eight times and not more than 16 times the nominal diameter of the cabled cores.
- The core shall not be spliced.

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Where filler cores are used, on 4 (four) cores and 5 (five) cores assembly, materials shall be compliant with the operating temperatures.

- factor for mass: 1,03;
- factor for ohmic resistance: 1,03.

5.2.2 Colour coding of single core cables

For differentiation with copper cables, all single core cables shall be of Light GREY – colour code K as defined in Table 2, and markings shall be as defined in Clause 6.

Table 2 — Colour code

Code	Colour ^a
A	Red (2)
B	Blue (6)
C	Yellow (4)
D	Green (5)
E	White (9)
F	Black (0)
G	Brown (1)
H	Orange (3)
J	Violet (7)
K	Grey (8)
^a For information: international colour code.	

5.2.3 Colour coding of unscreened, multicore cables

See Table 3, differentiation with copper cables shall be given by markings as defined in Clause 6.

Table 3 — Code P

Number of cores in cables	Colours (light colours acceptable)									
2	Red	Blue								
3	Red	Blue	Yellow							
4	Red	Blue	Yellow	Green						
5	Red	Blue	Yellow	Green	White					
NOTE Jacket (if requested): Light grey, manufacturer markings according to Table 4.										

Table 4 — Colour of manufacturer identification markings

Colours	Nominal conductor cross-section mm ²	AWG ^a
Blue	0,25	24
	0,6	20
	1,2	16
	3	12
	9	8
	22	4
Green	0,15	26
	0,4	22
	1	18
	2	14
	5	10
	14	6
Black	28	3
	107	0 000

^a AWG = Closest American Wire Gauge.

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6 Identification and marking

The identification and marking of cables by the manufacturer shall be in accordance with ISO 2574 and this standard.

As the designation, required for orders, is generally too long for use in electrical drawings, a shorter cross designation (without colour information) is given in TR 6058 plus the corresponding nearest AWG (gauge code).

To facilitate further manufacturing operations and differentiate these aluminium cables from copper cables, markings are necessary on both core(s) and jacket (when there is a jacket).

Dark spots are not necessary on jacket.