



# SLOVENSKI STANDARD

## SIST EN 3719:2010

01-oktober-2010

Nadomešča:  
SIST EN 3719:2006

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**Aeronavtika - Vodniki za električne kable iz aluminija in aluminijevih zlitin - Standard za proizvod**

Aerospace series - Aluminium or aluminium alloy conductors for electrical cables - Product standard

Luft- und Raumfahrt - Leiter aus Aluminium oder Aluminiumlegierung für elektrische Leitungen - Produktnorm

STANDARD PREVIEW  
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Série aérospatiale - Conducteurs en aluminium ou en alliage d'aluminium pour câbles électriques - Norme de produit

<https://standards.iteh.ai/catalog/standards/sist/f98a80b2-99ac-464d-b56e-f7b31a2822ac/sist-en-3719-2010>

**Ta slovenski standard je istoveten z: EN 3719:2010**

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**ICS:**

49.025.20	Aluminij	Aluminium
49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 3719**

July 2010

ICS 49.060

Supersedes EN 3719:2005

English Version

## Aerospace series - Aluminium or aluminium alloy conductors for electrical cables - Product standard

Série aérospatiale - Conducteurs en aluminium ou en alliage d'aluminium pour câbles électriques - Norme de produit

Luft- und Raumfahrt - Leiter aus Aluminium oder Aluminiumlegierung für elektrische Leitungen - Produktnorm

This European Standard was approved by CEN on 4 March 2010.

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 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 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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## Contents

Page

Foreword.....	3
1 Scope .....	4
2 Normative references .....	4
3 Terms, definitions and symbols.....	4
4 Conductor materials and construction .....	4
4.1 Materials .....	4
4.2 Material for individual strands and code.....	4
4.3 Aluminium or aluminium alloy .....	5
4.4 Construction of conductors .....	5
4.4.1 Lay length .....	5
4.4.2 Joints .....	5
4.4.3 Compaction .....	5
5 Required characteristics .....	5
6 Test methods.....	6
7 Quality assurance .....	7
8 Designation .....	7
9 Marking, packaging and delivery lengths .....	7

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## Foreword

This document (EN 3719:2010) 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 January 2011, and conflicting national standards shall be withdrawn at the latest by January 2011.

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.

This document supersedes EN 3719:2005.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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**EN 3719:2010 (E)****1 Scope**

This standard specifies the dimensions, linear resistance, mechanical characteristics, construction and mass of conductors in aluminium or aluminium alloy for electrical cables for aerospace applications.

It applies to stranded conductors with nominal cross-sections of 5 mm<sup>2</sup> to 107 mm<sup>2</sup> inclusive.

**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.

EN 3475-100:2010<sup>1)</sup>, *Aerospace series — Cables, electrical, aircraft use — Test methods — Part 100: General*

EN 9133, *Aerospace series — Quality management systems — Qualification procedure for aerospace standard parts*

**3 Terms, definitions and symbols**

For the purposes of this document, the terms, definitions and symbols given in EN 3475-100:2010 apply.

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**4 Conductor materials and construction**

SIST EN 3719:2010

**4.1 Materials**

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The conductors in accordance with this standard shall consist of individual annealed aluminium (EC grade 99,7 % AL) or aluminium alloy strands with the following composition defined in Table 1.

**Table 1**

%	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	V	B	Others		Al
											singly	together	
min.	—	0,50	—	—	0,08	—	—	—	—	—	—	—	99,1
max.	0,10	0,80	0,035	0,01	0,25	0,007	0,05	0,02	0,007	0,015	0,03	0,10	—

**4.2 Material for individual strands and code**

The individual strands may be:

- pure aluminium (code E);
- aluminium alloy (code A);
- aluminium alloy with tin plating (code B);

1) As well as all parts quoted in this standard.

- aluminium alloy with silver plating (code C);
- aluminium alloy with nickel plating (code D).

Plating thickness shall be at least 1,0 µm for silver and 1,0 µm for nickel.

When tin plating is authorized, the thickness shall be sufficient to comply with the tests specified in EN 3475-506 and EN 3475-507.

### 4.3 Aluminium or aluminium alloy

The maximum resistivity shall be:  $3,0 \times 10^{-8} \Omega \cdot m$ .<sup>2)</sup>

The elongation at rupture for each individual strand shall be  $\geq 10 \%$ .

The tensile strength of each individual strand shall be at least 105 MPa (105 N/mm<sup>2</sup>).

### 4.4 Construction of conductors

#### 4.4.1 Lay length

Up to 9 mm<sup>2</sup> cross-section inclusive (code 090), concentric conductors are used. The lay for the strands of a concentric conductor, checked over the outside layer of a test piece 1 m long, shall be between eight times and 16 times the maximum diameter of this conductor.

For sectional areas between 14 mm<sup>2</sup> and 107 mm<sup>2</sup> (codes 140 to 107), the conductor comprises concentric or bunched conductors twisted together. The lay of the strands for the basic concentric or bunched conductors shall not exceed 30 times the diameter of the concentric or bunched conductor in question.

The lay for concentric (or bunched) conductors, measured over the outer layer of the conductor, shall be between eight times and 16 times the maximum conductor diameter.

In all cases the lay of the outer layer shall be left-hand.

#### 4.4.2 Joints

The conductors shall be free from any joints. Each strand comprising the conductors may, however, include soldered or brazed joints. For strands with a diameter of 0,25 mm or greater, butt joints shall be used.

The distance between two joints in individual strands shall exceed 3 m, measured between different strands.

#### 4.4.3 Compaction

Compaction of the conductor, causing deformation of the strands with damage to the plating, is not permitted.

## 5 Required characteristics

See Table 2.

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2) Or 30 Ω · m<sup>2</sup>/km.

Table 2

Code	Nominal cross-section mm <sup>2</sup>	Number of strands	Nominal diameter of strands mm	Diameter of conductor mm		Resistance at 20 °C <sup>a b</sup> Ω/km max.	Mass max. <sup>b</sup> kg/km	AWG <sup>c</sup>	Number of missing single strands
				min.	max.				
050	5	27	0,51	2,70	3,10	5,80	15,4	10	0
090	9	41	0,51	3,50	3,90	3,80	25,4	8	0
140	14	7 × 10	0,51	4,75	5,25	2,20	45,0	6	0
220	22	7 × 15	0,51	5,80	6,40	1,50	67,6	4	0
280	28	7 × 19	0,51	6,50	7,10	1,18	77,0	3	0
340	34	7 × 24	0,51	7,40	8,00	0,94	108,1	2	2
420	42	7 × 30	0,51	8,30	8,90	0,75	135,3	1	2
530	53	19 × 14	0,51	9,70	10,30	0,60	171,3	0	3
680	68	19 × 18	0,51	11,10	11,70	0,43	220,3	00	3
850	85	19 × 22	0,51	12,40	13,00	0,36	269,2	000	4
107	107	27 × 20 or Layer 1: 7 × 15	0,51						
107	107	Layer 2: 12 × 15 Layer 3: 15 × 14 + 3 × 15	0,51 0,51 0,51 0,51	14,10	14,80	0,29	347,5	0000	5

<sup>a</sup> For other temperatures this may be calculated using the formula shown in EN 3475-301.

<sup>b</sup> Not taking into consideration metal platings, assuming that their effect is minimal.

<sup>c</sup> AWG = closest American Wire Gage.

## 6 Test methods

According to EN 3475-100.

See Table 3.