SLOVENSKI STANDARD
SIST EN 2346-003:2009

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Aeronavtika - Električni, ognjevzdržni kabli - Delovne temperature med -65 °C in 260 °C - 003. del: Družina DL, enožilni kabli - Standard za proizvod

Aerospace series - Cable, electrical, fire resistant - Operating temperatures between - 65 °C and 260 °C - Part 003: DL family, single core - Product standard

Luft- und Raumfahrt - Feuerbeständige elektrische Leitungen - Betriebstemperaturen zwischen - 65 °C und 260 °C - Teil 003: DL-Familie, eine Leitung - Produktnorm

Série aérospatiale - Câbles électriques résistant au feu - Températures de fonctionnement comprises entre - 65 °C et 260 °C - Partie 003 : Famille DL, fil simple - Norme de produit

Ta slovenski standard je istoveten z: **EN 2346-003:2006**

ICS:

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

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Contents

Page

Foreword

This European Standard (EN 2346-003:2006) has been prepared by the European Association of Aerospace Manufacturers - Standardization (AECMA-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 AECMA, 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of an identical text or by endorsement, at the latest by December 2006, and conflicting national standards shall be withdrawn at the latest by December 2006.

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1 Scope

This standard specifies the characteristics of fire resistant electrical cables for use in the on-board electrical systems of aircraft at operating temperatures between – 65 °C and 260 °C.

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.

IEC 28:1925, *International standard of resistance for copper.*

EN 2234, *Aerospace series – Cable, electrical, fire resistant – Technical specification.* [1)]

EN 2346-002, *Aerospace series – Cable, electrical, fire resistant – Operating temperatures between – 65 °C and 260 °C – Part 002: General.*

EN 3475-100*, *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 and definitions

For the purposes of this standard, the terms and definitions given in EN 3475-100 apply.

4 Materials and construction

4.1 Materials

4.1.1 Conductors

Individual strands used for the conductors shall be cylindrical and shall be:

— of nickel clad copper alloy for nominal cross sections of 0,4 mm^2 (code 004);

— of nickel clad copper for nominal cross sections ≥ 0,6 mm^2 (codes ≥ 006).

The copper shall meet the requirements of IEC 28 and the copper alloy the requirements of EN 2234.

4.1.2 Insulation

The insulation shall comply with the requirements of EN 2234.

4.2 Construction

See Table 1.

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* And all parts quoted in this standard.

1) Published at AECMA Prestandard at the date of publication of this standard.

Table 1

Code number	Nominal cross section	AWG [a]	Number of strands	Nominal diameter of strands	Conductive resistance at 20 °C	Conductor diameter	External diameter		Mass	Number of missing strands
	mm^2			mm	Ω/km	mm	mm	mm	g/m	
					max.	max.	min.	max.	max.	
004	0,4	22	19	0,15	80,90	0,80	1,90	2,10	9,0	0
006	0,6	20	19	0,20	44,30	1,04	2,15	2,36	12,7	0
010	1,0	18	19	0,25	27,90	1,29	2,40	2,65	16,9	0
012	1,2	16	19	0,30	18,80	1,53	2,60	2,90	20,8	0
020	2	14	37	0,25	13,90	1,82	2,95	3,20	27,7	0
030	3	12	37	0,32	8,94	2,28	3,40	3,75	40,2	0
050	5	10	37	0,40	5,61	2,88	3,95	4,30	58,5	0
090	9	8	127	0,30	3,14	4,40	5,40	5,85	104,0	0
140	14	6	27 × 7	0,30	1,98	5,50	6,45	7,00	156,0	0
220	22	4	37 × 12	0,25	1,25	6,80	7,90	8,40	237,0	0
340	34	2	37 × 19	0,25	0,81	8,60	9,65	10,30	364,0	2
420	42	1	37 × 23	0,25	0,60	9,50	10,60	11,25	444,0	2
530	53	0	37 × 29	0,25	0,52	10,70	11,75	12,45	557,0	3
680	68,0	00	37 × 37	0,25	0,40	12,10	13,00	14,00	698,0	3

[a] Closest American Wire Gage.

4.3 Number of cores

See EN 2346-002.

4.4 Colour coding of cores

See EN 2346-002.

5 Required characteristics

According to EN 2234 and EN 3475-100.

See Table 2 and Table 3.

6 Tests

See Table 2.

Table 2

EN 3475-	Designation of the test	Remarks
201	Visual examination	Applicable.
202	Mass	Applicable Table 1.
203	Dimensions	Applicable Table 1.
301	Ohmic resistance per unit length	Applicable Table 1.
302	Voltage proof test – Immersion test	Applicable EN 2234.
302	Voltage proof test – Dry spark test	Applicable EN 2234.
303	Insulation resistance	Applicable EN 2234.
304	Surface resistance	Applicable EN 2234.
305	Overload resistance	Applicable to code 006 EN 2234. $T_1 = (310 \pm 5)$ °C. $T_2 = (450 \pm 5)$ °C.
401	Accelerated ageing	Applicable EN 2234. Temperature: (310 ± 5) °C.
402	Shrinkage and delamination	Applicable. Temperature: (310 ± 5) °C. Maximum shrinkage: 1,5 mm.
403	Delamination and blocking	Applicable EN 2234. Temperature: (310 ± 5) °C.
404	Thermal shock	Applicable EN 2234. Temperature: (260 ± 5) °C. Maximum shrinkage: 1,5 mm
405	Bending at ambient temperature	Applicable EN 2234.
406	Cold bend test	Applicable EN 2234. Temperature: (– 55 ± 2) °C.
407	Flammability – Method 1	Applicable EN 2234. Extinction time: 3 s.
408	Fire resistance	Applicable, load 170 g for code 004 and 340 g for codes ≥ 006.
409	Air-excluded ageing	Applicable. Temperature: (180 ± 5) °C – 336 h.
410	Thermal endurance	Applicable EN 2234. 40 000 h at 260 °C.
411	Resistance to fluids	Applicable EN 2234.
412	Humidity resistance	Not applicable.
413	Wrap back test	Applicable.
414	Differential scanning calorimeter (DSC test)	Not applicable.

continued

Table 2 *(concluded)*

EN 3475-	Designation of the test	Remarks
501	Dynamic cut-through	Applicable to codes 004 to 050 included. Temperature 260 °C – 1 h. See Table 3.
502	Notch propagation	Applicable to codes 004 to 050 included. Depth notch: 0,25 mm.
503	Scrape abrasion	Applicable to codes 004 to 050 included. See Table 3.
504	Torsion	Applicable to codes 004 to 050 included. $T_3 = (260 \pm 5)$ °C. $T_4 = (275 \pm 5)$ °C.
505	Tensile test on conductors and strands	Applicable.
506	Plating continuity	Applicable.
507	Adherence of plating	Applicable.
508	Plating thickness	Applicable.
509	Solderability	Not applicable.
510	Tensile strength and elongation of extruded insulation, sheath and jacket material	Not applicable.
511	Cable-to-cable abrasion	Not applicable.
512	Flexure endurance	Not applicable.
601	Smoke density	Not applicable.
602	Toxicity	Not applicable.
603	Resistance to wet arc tracking	Not applicable.
604	Resistance to dry arc propagation	Not applicable.
605	Wet short circuit test	Not applicable.
701	Strippability and adherence of insulation to the conductor	Strippability applicable. Adherence not applicable.
702	Screen pushback capability	Not applicable.
703	Permanence of manufacturer's marking	Applicable.
704	Flexibility	Not applicable.
705	Contrast measurement	Not applicable.
706	Laser markability	Not applicable.