
Aeronavtika ñ Eno- ali vel' ñilni elektril' ni kabli za sploño uporabo ñ Delovne temperature med ñ55 ÅC in 200 ÅC ñ 003. del: Oklopljeni (spiral) in oplagl' eni, z moñnostjo brizganega tiskanja ñ Standard za proizvod

Aerospace series - Cables, electrical, single and multicore for general purpose - Operating temperatures between - 55 °C and 200 °C - Part 003: Screened (spiral) and jacketed, ink jet printable - Product standard

Luft- und Raumfahrt - Leitungen, elektrisch, ein- und mehradrig, für allgemeine Verwendung - Betriebstemperaturen zwischen - 55 °C und 200 °C - Teil 003: Geschirmt (Umseilung) und ummantelt, Tintenstrahl bedruckbar - Produktnorm

SIST EN 2713-003:2006
Série aérospatiale - Câbles électriques, mono et multiconducteurs d'usage général - Températures de fonctionnement comprises entre - 55 °C et 200 °C - Partie 003 : Blindés (guipés) et gainés, marquables au jet d'encre - Norme de produit

Ta slovenski standard je istoveten z: EN 2713-003:2005

ICS:

49.060

SIST EN 2713-003:2006

en

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English Version

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This European Standard was approved by CEN on 28 October 2005.

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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 Central Secretariat has the same status as the official versions.

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Foreword

This European Standard (EN 2713-003:2005) 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of an identical text or by endorsement, at the latest by June 2006, and conflicting national standards shall be withdrawn at the latest by June 2006.

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1 Scope

This standard specifies the characteristics of ink jet printable single and multicore screened (spiral) and jacketed electrical cables for use in the on-board electrical systems of aircraft, at operating temperatures between – 55 °C and 200 °C.

It shall also be possible to mark these cables by hot stamp printing.

These markings shall be in accordance with EN 3838.

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 2083, *Aerospace series — Copper and copper alloy conductors for electrical cables — Product standard*

EN 2235, *Aerospace series — Cables, electrical, single and multicore, screened and jacketed — Technical specification*¹⁾

EN 2266-003, *Aerospace series — Cables, electrical, for general purpose — Operating temperatures between – 55 °C and 200 °C — Part 003: Ink jet printable — Product standard*²⁾

EN 2713-002, *Aerospace series — Cables, electrical, single and multicore for general purpose — Operating temperatures between – 55 °C and 200 °C — Part 002: Screened and jacketed — General*

EN 3475-100 (series), *Aerospace series — Cables, electrical, aircraft use — Test methods — Part 100: General*

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

EN 9133, *Aerospace series — Quality management systems — Qualification procedure for aerospace standard parts*¹⁾

3 Definitions and symbols

See EN 3475-100

4 Materials and construction

4.1 Materials

These cables shall consist of the following:

- cores according to EN 2266-003, top coat dispersion fluorocarbon;
- number of cores 1 to 4.

2 to 4-core cables shall be twisted together according to EN 2235.

Filler cores shall not be permitted.

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

2) In preparation at the date of publication of this standard

Screen:

- nickel-plated copper stranded spiral screen;
- for dimensions of strands, see Table 1;
- material according to EN 2083, tests according to EN 3475-100;
- construction according to EN 2235.

Outer jacket:

- layer of polyimide with total wall thickness (nominal value) of 30 µm, coated on both sides with a layer 2,5 µm thick of fluorocarbon;
- direction of winding immaterial — overlap 67 % min.; or two layers — winding direction of first immaterial, overlap 51 % min. and second layer in opposite direction with 20 % min. overlap;
- top coat of dispersion fluorocarbon, wall thickness 15 µm min. including the necessary additives for the acceptance of user-applied ink jet marking.

4.2 Construction

See EN 2083 and Table 1.

Table 1

Number of cores	Code for nominal section	Nominal section	AWG ^b	Linear resistance at 20 °C	Screen strands nominal diameter mm	External diameter	Mass
		mm ²		Ω/km max.		mm max.	kg/km max.
1	001	0,15	26	160,0	0,08	1,28	4,3
	002	0,25	24	114,0	0,08	1,37	5,3
	004	0,4	22	60,0	0,08	1,53	6,9
	006	0,6	20	33,2	0,08	1,80	10,2
	010	1	18	21,1	0,08	2,05	14,1
	012	1,2	16	14,5	0,10	2,35	19,7
	020	2	14	10,9	0,10	2,59	25,1
	030	3	12	6,8	0,10	3,15	38,3
	050	5	10	4,2	0,12	3,85	60,7
	051 ^a	5	10	4,1	0,12	3,90	63,3
2	001	0,15	26	165,00	0,08	2,12	7,6
	002	0,25	24	117,00	0,08	2,31	9,6
	004	0,4	22	61,70	0,08	2,62	12,7
	006	0,6	20	34,10	0,10	3,17	20,3
	010	1	18	21,70	0,10	3,70	28,1
	012	1,2	16	14,90	0,12	4,22	39,1
	020	2	14	11,20	0,12	4,80	50,1
	030	3	12	6,99	0,15	5,85	78,8
	050	5	10	4,32	0,20	7,24	127,5
	051 ^a	5	10	4,22	0,20	7,36	131,5
3	001	0,15	26	165,00	0,08	2,25	10,5
	002	0,25	24	117,00	0,10	2,50	14,0
	004	0,4	22	61,70	0,10	2,85	18,7
	006	0,6	20	34,10	0,12	3,45	29,2
	010	1	18	21,70	0,12	4,00	41,4
	012	1,2	16	14,90	0,12	4,55	55,6
	020	2	14	11,20	0,15	5,10	74,6
	030	3	12	6,99	0,20	6,30	119,2
4	001	0,15	26	165,0	0,10	2,50	13,8
	002	0,25	24	117,0	0,10	2,72	17,4
	004	0,4	22	61,7	0,10	3,10	23,7
	006	0,6	20	34,1	0,12	3,75	37,7
	010	1	18	21,7	0,12	4,45	53,0
	012	1,2	16	14,9	0,15	5,10	74,5
	020	2	14	11,2	0,20	5,80	101,5

^a Flexible construction which may be used as an alternative

^b AWG = Closest American Wire Gauge

4.3 Colour coding of cores and jacket

See EN 2713-002

5 Required characteristics

According to EN 2235 and EN 3475-100

See Table 2.

Table 2

EN 3475-	Test	Details
201	Visual examination	Applicable
202	Mass	Applicable; see Table 1
203	Dimensions	Applicable; see Table 1
301	Electrical resistance per unit length	Applicable; see Table 1
302	Voltage proof test	Applicable
303	Insulation resistance	Applicable
304	Surface resistance	Applicable
305	Overload resistance	Not applicable
306		Applicable
401	Accelerated ageing	Applicable Temperature (250 ± 5) °C
402	Shrinkage and delamination	Applicable Temperature (250 ± 5) °C Maximum shrinkage at each end of cable: jacket 2 mm, core insulation, see EN 2266-003
403	Delamination and blocking	Applicable Temperature (250 ± 5) °C
404	Thermal shock	Applicable Temperature (250 ± 5) °C Maximum shrinkage at each end of cable: jacket 2 mm, core insulation, see EN 2266-003
405	Bending at ambient temperature	Applicable
406	Cold bend test	Applicable
407	Flammability	Applicable Extinguishing time: 3 s max.
408	Fire resistance	Not applicable
409	Air-excluded ageing	Not applicable
410	Thermal endurance	Applicable 40 000 h (temperature 200 °C)
411	Resistance to fluids	Applicable
412	Humidity resistance	Not applicable
413	Wrap back test	Not applicable
414	Differential scanning calorimeter (DSC test)	Not applicable
415	Rapid change of temperature	Not applicable
416	Thermal stability	Not applicable

Table 2 (concluded)

EN 3475-	Test	Details
501	Dynamic cut-through	Not applicable
502	Notch propagation	Applicable Notch depth: 40 µm
503	Scrape abrasion	Applicable Test force on needle for cables 0,15 mm ² to 0,60 mm ² = 8 N 1,00 mm ² to 1,20 mm ² = 10 N 2,00 mm ² to 5,00 mm ² = 12 N
504	Torsion	Not applicable
505	Tensile test on concentric 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
513	Deformation resistance (Installation with plastic cable ties)	Not applicable
601	Smoke density	Applicable
602	Toxicity	Applicable
603	Resistance to wet arc tracking and electric arc propagation	Not applicable
604	Resistance to dry arc tracking and electric arc propagation	Not applicable
701	Strippability and adherence of insulation to the conductor	Applicable
702	Braid screen pushback capability	Not applicable
703	Permanence of manufacturer's marking	Applicable

6 Quality assurance

See EN 3042