SLOVENSKI STANDARD
SIST EN 4608-004:2015

01-september-2015

Aeronavtika - Električni ognjevzdržni kabli - Enožilni in posukani večžilni kabli, zaslonjeni (opleteni) in oplaščeni - Delovne temperature med –65 °C in 260 °C - 004. del: Družina DW - Lahki - Z možnostjo UV-laserskega tiskanja - Standard za proizvod

Aerospace series - Cable, electrical, fire resistant - Single and twisted multicore assembly, screened (braided) and jacketed - Operating temperatures between - 65 °C and 260 °C - Part 004: DW family - Lightweight - UV Laser printable - Product standard

Luft- und Raumfahrt - Feuerbeständige elektrische Leitungen - Einzel- und mehradrig verdrillte Leitungen, geschirmt (Geflecht) und ummantelt - Betriebstemperaturen zwischen - 65 °C und 260 °C - Teil 004: DW-Familie - Leichte Bauweise - UV Laser bedruckbar - Produktnorm

Série aérospatiale - Câbles électriques blindés résistant au feu - Simple et multifilaire blindé (tresse) gainé - Températures de fonctionnement comprises entre - 65 °C et 260 °C - Partie 004: Famille DW - Fil allégé - Marquable laser UV - Norme de produit

Ta slovenski standard je istoveten z: **EN 4608-004:2015**

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

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This European Standard was approved by CEN on 21 June 2014.

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

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Contents

Page

European foreword

This document (EN 4608-004:2015) 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of an identical text or by endorsement, at the latest by December 2015, and conflicting national standards shall be withdrawn at the latest by December 2015.

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1 Scope

This European Standard specifies the characteristics of lightweight fire proof, screened, electrical cables for use in the on-board electrical systems of aircraft at operating temperature between – 65 °C and 260 °C.

These cables are UV Laser printable in accordance with EN 3838.

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

EN 2346-005, *Aerospace series — Cable, electrical, fire resistant — Operating temperatures between − 65 °C and 260 °C — Part 005: DW family, single UV laser printable and multicore assembly — Light weight — Product standard*

EN 3475 (all parts), *Aerospace series — Cables, electrical, aircraft use — Test methods*

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

EN 4608-001, *Aerospace series — Cable, electrical, fire resistant — Single and twisted multicore assembly, screened (braided) and jacketed — Operating temperatures between − 65 °C and 260 °C — Part 001: Technical specification*

EN 4608-002, *Aerospace series — Cable, electrical, fire resistant — Single and twisted multicore assembly, screened (braided) and jacketed — Operating temperatures between − 65 °C and 260 °C — Part 002: General*

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

3 Terms and definitions

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

4 Materials and construction

4.1 Materials

These cables shall consist of the following:

— Cores according to EN 2346-005;

— Number of cores: 1 to 3.

2 and 3-core shall be twisted together according to EN 4608-001.

Screen:

— Nickel plated copper braid;

— See Table 1 for strand diameter;

— Material according to EN 2083, tests according to EN 3475-100;

— Construction according to EN 4608-001.

Outer jacket:

— Sintered wrapped PTFE UV laser printable.

4.2 Construction

See Table 1.

Table 1

No. of core	Code No.	Nominal cross section	AWG [a]	Number of strands	Nominal diameter of strands	Conductive resistance at 20 °C	Nominal diameter of shield strands	External diameter	Mass	Number of missing strands
		mm^2			mm	max. Ohm/km	mm	max. mm	max. g/m	
1	002	0,2	24	19	0,12	131,00	0,10	2,61	14,15	0
	004	0,4	22	19	0,15	80,90	0,10	2,73	16,51	
	006	0,6	20	19	0,20	44,30	0,10	3,01	21,54	
	010	1,0	18	19	0,25	27,90	0,12	3,57	31,19	
	012	1,2	16	19	0,30	18,80	0,12	3,72	36,94	
	020	2,0	14	37	0,25	13,90	0,12	4,24	46,40	
	030	3,0	12	37	0,32	8,9	0,12	4,79	62,87	
2	002	For GPB 24, see EN 4608-005.								
	004	0,4	22	19	0,15	82,50	0,12	4,30	29,66	0
	006	0,6	20	19	0,20	45,20	0,12	4,90	40,51	
	010	1,0	18	19	0,25	28,50	0,12	5,90	56,25	
	012	1,2	16	19	0,30	19,20	0,12	6,20	65,71	
	020	2,0	14	37	0,25	14,20	0,12	7,20	85,98	
	030	3,0	12	37	0,32	9,1	0,12	8,30	118,48	
3	002	0,2	24	19	0,12	133,60	0,12	4,40	33,61	0
	004	0,4	22	19	0,15	82,50	0,12	4,50	39,15	
	006	0,6	20	19	0,20	45,20	0,12	5,20	54,46	
	010	1,0	18	19	0,25	28,50	0,12	6,20	77,01	
	012	1,2	16	19	0,30	19,20	0,12	6,60	90,47	
	020	2,0	14	37	0,25	14,20	0,15	7,80	125,75	
	030	3,0	12	37	0,32	9,1	0,15	9,00	174,02	

[a] Closest American Wire Gauge.

4.3 Colour code

See EN 4608-002.

5 Required characteristics

See EN 4608-001 and Table 2.

- Operating temperature: 260 °C max. continuous;
- Operating voltage: 600 V AC;
- Use frequency: 2 000 Hz max.

6 Tests

See Table 2.

Table 2 — Tests *(1 of 3)*

EN 3475-	Title	Details
201	Visual examination	Applicable. NOTE For qualification laser marked samples are also to be tested.
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.
302	Voltage proof test – Dry test	Applicable.
303	Insulation resistance	Applicable.
304	Surface resistance	Applicable.
305	Overload resistance	Not applicable.
306	Continuity of conductors	Applicable.
401	Accelerated ageing	Applicable. Temperature: (310 ± 5) °C. NOTE For qualification laser marked samples are also to be tested.
402	Shrinkage and delamination	Applicable. Temperature: (310 ± 5) °C. Maximum shrinkage at each end of the jacket: — 2 mm on AWG 24 to 18 — 3 mm on AWG 16 to 12 Core: according to EN 2346.
403	Delamination and blocking	Applicable. Temperature: (310 ± 5) °C.

Table 2 *(2 of 3)*

EN 3475-	Title	Details
404	Thermal shock	Applicable. Temperature (260 ± 5) °C. Maximum shrinkage at each end of the jacket: — 2 mm on AWG 24 to 18 — 3 mm on AWG 16 to 12 Core: according to EN 2346.
405	Bending at ambient temperature	Applicable. NOTE For qualification laser marked samples are also to be tested.
406	Cold bend test	Applicable. Temperature: (– 65 ± 2) °C.
407	Flammability – Method 1	Applicable. Extinction time: 3 s.
408	Fire resistance	Applicable. 15 min. Insulation resistance: 10 000 ohms. Load: 170 g for 004; 340 g for ≥ 006.
409	Air-excluded ageing	Not applicable.
410	Thermal endurance	Not applicable.
411	Resistance to fluids	Applicable. NOTE For qualification laser marked samples are also to be tested.
412	Humidity resistance	Not applicable.
413	Wrap back test	Not applicable.
414	Differential scanning calorimeter (DSC test)	Applicable (only if PTFE in the construction)
415	Rapid change of temperature	Not applicable.
416	Thermal stability	Not applicable.
417	Fire resistance of cables confined inside a harness	Not applicable.
501	Dynamic cut-through	Applicable to codes 004 to 020 included. Temperature 260 °C, 1 h. See Table 3.
502	Notch propagation	Applicable to codes 004 to 020 included. Depth notch: 0,10 mm.
503	Scrape abrasion	Applicable on single core screened jacketed only. Load, see Table 3.
504	Torsion	Not applicable.
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.