BS EN 4608-003:2012

BSI Standards Publication

Aerospace series — Cable, electrical, fire resistant — Single and twisted multicore assembly, screened (braided) and jacketed — Operating temperatures between -65 °C and 260 °C

Part 003: DN family — Lightweight — UV Laser printable — Product standard

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Aerospace series - Cable, electrical, fire resistant - Single and twisted multicore assembly, screened (braided) and jacketed - Operating temperatures between -65 °C and 260 °C - Part 003: DN family - Lightweight - UV Laser printable - Product standard

Série aérospatiale - Câbles électriques blindés résistant au feu - Simple et multifilaire blindé (tressé) et gainé - Températures de fonctionnement comprises entre - 65 °C et 260 °C - Partie 003: Famille DN - Fil allégé - Marquable laser UV - Norme de produit

Luft- und Raumfahrt - Feuerberständige elecktrische Leitungen - Einzel- und mehradrig verdrillte Leitungen, geschirmt (Geflecht) und ummantelt - Betriebstemperaturen zwischen -65 °C und 260 °C - Teil 003: DN Familie - leichte Bauweise - UV Laser bedruckbar - Produktnorm

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Foreword

This document (EN 4608-003:2012) 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.

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1 Scope

This European Standard specifies the characteristics of a light weight fire resistant, 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 referenced document, 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 2346-004, *Aerospace series — Cable, electrical, fire resistant — Operating temperatures between -65 °C and 260 °C — Part 004 : DN family, single UV laser printable and multicore assembly — Light weight — Product standard*

EN 3475, *Aerospace series — Cables, electrical, aircraft use — Test methods* [1)]

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 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 2346-004

— Number of cores: 1 to 3

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

1) Including all its parts

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

Table 1

No. of cores	Code No.	Nominal cross section (mm^2)	AWG [a]	Number of strands	Nominal diameter of strands (mm)	Conductive resistance at 20°C Ohm/km max.	Nominal diameter of shield strands (mm)	Shield diameter max. (mm)	External diameter max. (mm)	Mass max. (g/m)	Number of missing strands
1	004	0,4	22	19	0,15	80,90	0,10	2,08	2,78	17,3	0
	006	0,6	20	19	0,20	44,30	0,10	2,32	3,00	21,25	0
	010	1,0	18	19	0,25	27,90	0,12	2,65	3,30	27,7	0
	012	1,2	16	19	0,30	18,80	0,12	2,89	3,60	34,2	0
	020	2,0	14	37	0,25	13,90	0,12	3,39	4,10	43,8	0
2	004	0,4	22	19	0,15	82,50	0,12	3,84	4,70	31,7	0
	006	0,6	20	19	0,20	45,20	0,12	4,32	5,20	40,1	0
	010	1,0	18	19	0,25	28,50	0,12	4,82	5,60	49,5	0
	012	1,2	16	19	0,30	19,20	0,12	5,30	6,10	62,5	0
	020	2,0	14	37	0,25	14,20	0,12	6,30	7,10	81,2	0
3	004	0,4	22	19	0,15	82,50	0,12	4,09	5,0	41,8	0
	006	0,6	20	19	0,20	45,20	0,12	4,61	5,5	53,9	0
	010	1,0	18	19	0,25	28,50	0,12	5,15	5,90	67,8	0
	012	1,2	16	19	0,30	19,20	0,12	5,66	6,50	86,5	0
	020	2,0	14	37	0,25	14,20	0,15	6,86	7,70	118,7	0

[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: 2000 Hz max.

6 Tests

See Table 2.

Table 2

EN 3475 Test No.	Title	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	Immersion test applicable
302	Voltage proof test	Dry test applicable
303	Insulation resistance	Applicable
304	Surface resistance	Applicable
305	Overload resistance	Not Applicable
401	Accelerated ageing	Applicable Temperature: 310°C ± 5°C
402	Shrinkage and delamination	Applicable Temperature: 310°C ± 5°C Maximum shrinkage: 1,5 mm
403	Delamination and blocking	Applicable. Temperature: 310°C ± 5°C
404	Thermal shock	Applicable Temperature 260°C Maximum shrinkage: 1,5 mm
405	Bending at ambient temperature	Applicable

(continued)

Table 2 *(continued)*

EN 3475 Test No.	Title	Details
406	Cold bend test	Applicable Temperature: –55 °C ± 2 °C.
407	Flammability	Method 1 applicable Extinction time: 3 s
408	Fire resistance	Applicable 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.
412	Humidity resistance	Not applicable
413	Wrap back test	Not applicable
414	Differential scanning calorimeter (DSC test)	Not applicable
501	Dynamic cut-through	Applicable to codes 004 to 020 included Temperature 260 °C 1 hour See Table 3
502	Notch propagation	Applicable to codes 004 to 020 included Depth notch: 0,10 mm
503	Scrape abrasion	Applicable to codes 004 to 020 included 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

(continued)

Table 2 *(concluded)*

EN 3475 Test No.	Title	Details
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 tracking and electric 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	Applicable
703	Permanence of manufacturer's marking	Applicable
704	Flexibility	Not applicable
705	Contrast measurement	Applicable ≥ 50%
706	Laser markability	Applicable

Table 3

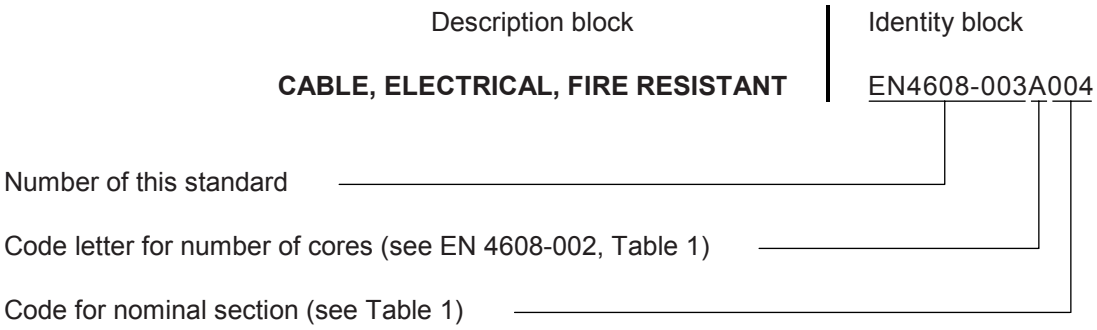
Code number	Nominal cross section (mm^2)	Test 501 Dynamic cut-through (N)	Test 503 Scrape abrasion Load N	
			20 °C	260 °C
004	0,4	45	6	3
006	0,6	55	6	3,5
010	1,0	70	7	4
012	1,2	85	7	4
020	2,0	95	8	4

7 Quality assurance

See EN 9133.

8 Designation

EXAMPLE



NOTE If necessary, the code I9005 should be placed between the description block and the identity block.

9 Identification and marking

See EN 4608-002.

10 Packaging, labelling and delivery lengths

See EN 4608-001.

11 Technical specification

See EN 4608-001.

Bibliography

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

TR 6058, *Aerospace series — Cable code identification list* [2]

[2] Published as ASD STAN Technical Report at the date of publication of this European Standard.

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