BS EN 4611-002:2012

BSI Standards Publication

Aerospace series — Cables, electrical, for general purpose, single and multicore assembly — XLETFE Family

Part 002: General

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National foreword

This British Standard is the UK implementation of EN 4611-002:2012.

The UK participation in its preparation was entrusted to Technical Committee ACE/6, Aerospace avionic electrical and fibre optic technology.

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

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Luft- und Raumfahrt - Ein- und mehradrige elektrische Leitungen zur allgemeinen Verwendung, XLETFE-Familie - Teil 002: Allgemeines

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Foreword

This document (EN 4611-002:2012) 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.

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of an identical text or by endorsement, at the latest by August 2012, and conflicting national standards shall be withdrawn at the latest by August 2012.

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1 Scope

This European Standard specifies the list of product standards and common characteristics of electrical cables for use in the on-board electrical systems of aircraft operating at temperatures between –65 °C to 135 °C and 150 °C dependant upon conductor type, operating at voltages not exceeding 600 V r.m.s and frequencies not exceeding 2 000 Hz. (unless otherwise specified in product standards).

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 2084, *Aerospace series – Cables, electric, single-core, general purpose, with conductors in copper or copper alloy – Technical specification*

EN 3475-100, *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*

TR 6058, *Aerospace series – Cable code identification list*[1)]

ISO 2635, *Aircraft – Conductors for general purpose aircraft electrical cables and aerospace applications – Dimensions and characteristics*

3 Terms, definitions, symbols and abbreviations

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

1) Published as AECMA Technical Report at the date of publication of this European Standard

4 List of product standards

EN 4611-003, *Aerospace series – Cables, electrical, for general purpose, single and multicore assembly – XLETFE Family – Part 003: Tin plated copper – Operating temperatures, between –65 °C and 135 °C – Single extruded wall for enclosed applications – UV laser printable – Product standard*

EN 4611-004, *Aerospace series – Cables, electrical, for general purpose, single and multicore assembly – XLETFE Family – Part 004: Tin plated copper – Operating temperatures, between –65 °C and 135 °C – Dual extruded wall for open applications – UV laser printable – Product standard*

EN 4611-005, *Aerospace series – Cables, electrical, for general purpose, single and multicore assembly – XLETFE Family – Part 005: Silver plated copper – Operating temperatures, between –65 °C and 150 °C – Single extruded wall for enclosed applications – UV laser printable – Product standard*

EN 4611-006, *Aerospace series – Cables, electrical, for general purpose, single and multicore assembly – XLETFE Family – Part 006: Silver plated copper – Operating temperatures, between –65 °C and 150 °C – Dual extruded wall for open applications –UV laser printable – Product standard*

EN 4611-007, *Aerospace series – Cables, electrical, for general purpose, single and multicore assembly – XLETFE Family – Part 007: Nickel plated copper – Operating temperatures, between –65 °C and 150 °C – Dual extruded wall for open applications – UV laser printable – Product standard*

EN 4611-008, *Aerospace series – Cables, electrical, for general purpose, single and multicore assembly – XLETFE Family – Part 008: BP – Nickel plated copper – Operating temperatures, between –65 °C and 150 °C – Dual extruded wall for open applications, with additional protection, in areas of high vibration, cable flexing and fluid contamination – UV laser printable – Product standard*

EN 4611-009, *Aerospace series – Cables, electrical, for general purpose, single and multicore assembly – XLETFE Family – Part 009: BJ – Nickel plated copper – Operating temperatures, between –65 °C and 150 °C – Single extruded wall for use as cable cores or within equipment, in areas of high vibration, cable flexing and fluid contamination – UV laser printable – Product standard*

5 Materials and construction

5.1 Materials

The cable conductors shall be made of copper or copper alloy and nickel or silver or tin-plated conforming to ISO 2635 Table 2 or as specified in product standards.

5.2 Construction

See individual product standards.

5.2.1 Number of cores

See Table 1.

Table 1

Number of cores	1	2	3	4	5	6	7	8	9	10
Specified code	A	B	C	D	E	F	G	H	J	K

5.2.2 Colour coding of single core cables

Unless specified by the purchaser coding shall be as follows:

See Table 2.

Table 2 – Colour code

Code	Colour [a]
A	Red (2)
B	Blue (6)
C	Yellow (4)
D	Green (5)
E	White (9)
F	Black (0)
G	Brown (1)
H	Orange (3)
J	Purple (7)
K	Grey (8)
L	Light Red (2L)
M	Not allocated
N	Not allocated
P	Not allocated
Q	Not allocated
R	Not allocated
S	Not allocated
T	Not allocated
U	Not allocated
V	Not allocated
W	Not allocated

[a] For information: International colour code

Unless otherwise specified in the product standard or contract when UV markable red is specified as the cable outer insulation or jacket then light red (2L) shall be used. Light red shall be a good match to Munsell 2.5R 6.9 to 7.4 or Federal Standard 595B - 31638 to 31668 or RAL 3015.

5.2.3 Colour coding of unscreened, multicore cables

Unless specified by the purchaser coding shall be as follows:

See Table 3.

Table 3

Number of cores in cables	Colours									
02	Red	Blue								
03	Red	Blue	Yellow							
04	Red	Blue	Yellow	Green						
05	Red	Blue	Yellow	Green	White					
06	Red	Blue	Yellow	Green	White	Black				
07	Red	Blue	Yellow	Green	White	Black	Brown			
08	Red	Blue	Yellow	Green	White	Black	Brown	Orange		
09	Red	Blue	Yellow	Green	White	Black	Brown	Orange	Purple	
10	Red	Blue	Yellow	Green	White	Black	Brown	Orange	Purple	Grey
Jacket colour shall be white unless specified by the purchaser.										

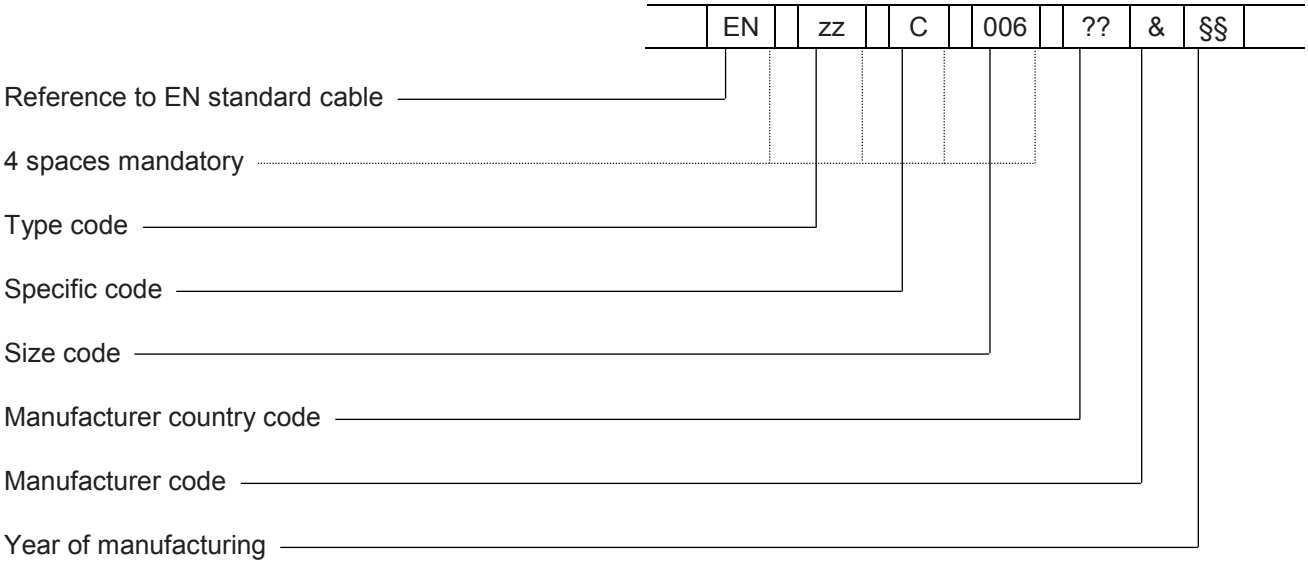
6 Identification and marking

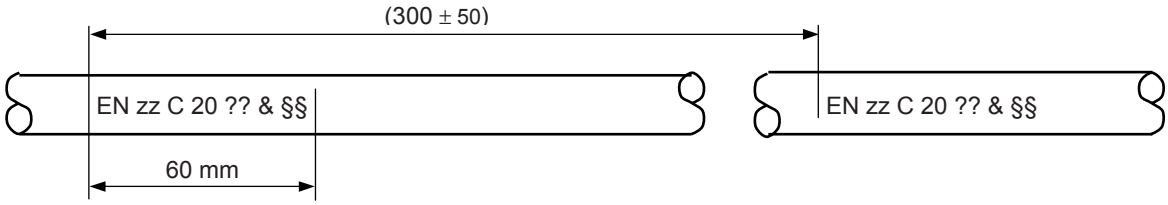
The identification and marking of cables by the manufacturer shall be in accordance with EN 2084.

As the designation, required for orders, is generally too long, for use in electrical drawings a shorter designation (without colour information) is given in TR 6058.

Example: Designation: EN 4611-004A006P
Cross reference: XLETFE 20

This shorter designation is used for identification and marking as in the following example:





For multicore cable with jacket, the marking shall be optional on core(s) and mandatory on jacket.

For multicore cable without jacket, each core shall be marked with his own designation.

The cables (single core or jacketed cable) shall be capable of being printed with user-applied UV laser markings according to EN 3838. Aggressive marking techniques are not permitted.

7 Technical specification

See EN 2084.

Bibliography

FED-STD-595B, *Colors used in government procurement*[2]

EN 4434, *Aerospace series – Copper or copper alloy lightweight conductors for electrical cables – Product standard (Normal and tight tolerances)*

[2] Published by: General Services Administration – Federal Supply Service Bureau – Specification Section – Suite 8100 – 470 East l'Enfant Plaza, SW – Washinton, DC 20407

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