SLOVENSKI STANDARD
SIST EN 4612-012:2019

01-november-2019

Nadomešča:
SIST EN 4612-012:2011

Aeronavtika - Eno- in večžilni električni kabli za splošne namene - Družina XLETFE - Oplaščeni ali zaslonjeni in oplaščeni - 012. del: Ponikljani baker - Obratovalne temperature med –65 °C in 150 °C - Dvojno ekstrudirana izolacija za zunanjo uporabo s plaščem in zaslonom (opletom) - Potiskljiva z UV-laserjem - Standard za proizvod

Aerospace series - Cables, electrical, for general purpose, single and multicore assembly - XLETFE Family - Jacketed or screened and jacketed - Part 012: Nickel plated copper - Operating temperatures, between – 65 °C and 150 °C - Dual extruded wall for open applications, with jacket and screen (braid) - UV laser printable - Product standard

Luft- und Raumfahrt - Ein- und mehradrige elektrische Leitungen für allgemeine Verwendung - XLETFE Familie - mit Mantel oder geschirmt und Mantel - Teil 012: Kupfer vernickelt - Betriebstemperaturen zwischen – 65 °C und 150 °C - Doppelt extrudierte Isolierung für externe Verwendung, mit Mantel und Schirm (Geflecht) - UV-Laser bedruckbar - Produktnorm

Ta slovenski standard je istoveten z: **EN 4612-012:2019**

ICS:

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

SIST EN 4612-012:2019 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 4612-012

September 2019

ICS 49.060

Supersedes EN 4612-012:2011

English Version

Aerospace series - Cables, electrical, for general purpose, single and multicore assembly - XLETFE Family - Jacketed or screened and jacketed - Part 012: Nickel plated copper - Operating temperatures, between - 65 °C and 150 °C - Dual extruded wall for open applications, with jacket and screen (braid) - UV laser printable - Product standard

Série aérospatiale - Câbles, électriques, d'usage général, mono et multiconducteurs - Famille XLETFE - Gainés ou blindés et gainés - Partie 012 : Cuivre nickelé - Températures de fonctionnement comprises entre - 65 °C et 150 °C - Fil double isolé pour applications externes, gainé et blindé (tressé) - Marquable au laser UV - Norme de produit

Luft- und Raumfahrt - Ein- und mehradrige elektrische Leitungen für allgemeine Verwendung - XLETFE Familie - mit Mantel oder geschirmt und Mantel - Teil 012: Kupfer vernickelt - Betriebstemperaturen zwischen - 65 °C und 150 °C - Doppelt extrudierte Isolierung für externe Verwendung, mit Mantel und Schirm (Geflecht) - UV-Laser bedruckbar - Produktnorm

This European Standard was approved by CEN on 5 May 2019.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 4612-012:2019) 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 March 2020, and conflicting national standards shall be withdrawn at the latest by March 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 4612-012:2011.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This document specifies the characteristics of UV laser printable jacket, nickel plated copper conductor, electrical cables crosslinked ethylene tetra fluoro ethylene co-polymer (XLETFE) family for use in the on-board electrical systems of aircraft at operating temperatures between – 65 °C and 150 °C, operating at voltages not exceeding 600 V rms. This insulation system has been used in aerospace applications using 115 V (phase-to-neutral) 400 Hz ac and 28 Vdc. Verification of the suitability of cables for use on other electrical systems is the responsibility of the user.

These cables are suitable for airframe use without additional protection. In case of conflict between this document and other referenced documents the requirements of this document shall take precedence.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 or copper alloy conductors for electrical cables — Product standard*

EN 2235, *Aerospace series — Single and multicore electrical cables, screened and jacketed — Technical specification*[1)]

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

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 4612-002, *Aerospace series — Cables, electrical, for general purpose, single and multicore assembly — XLETFE Family — Jacketed or screened and jacketed — Part 002: General*[1)]

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at http://www.iso.org/obp
- IEC Electropedia: available at http://www.electropedia.org/

1) Published as ASD-STAN Prestandard at the date of publication of this standard by AeroSpace and Defence industries Association of Europe — Standardization (ASD-STAN), http://www.asd-stan.org/

4 Materials and construction

4.1 Materials

These cables shall consist of the following:

- cores according to EN 4611-007;
- number of cores 1 (one) to 4 (four).

2 (two) core to 4 (four) core shall be twisted together according to EN 2235.

Filler cores shall not be permitted.

Screen:

- nickel plated copper stranded woven 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:

- XLETFE;
- it shall be possible to mark the jacket by UV laser printing.

4.2 Construction

See Table 1.

Table 1 — Single and multicore screened and jacketed

Number of cores	Code for nominal section	AWG [a]	Linear resistance at 20 °C max. Ω/km	Screen strands nominal diameter mm	Jacket thickness min. mm	External diameter max. mm	Mass max. kg/km
1	001 [b]	26	149,0	0,10	0,15	1,98	7,89
	002 [b]	24	106,0			2,11	9,38
	004	22	60,0			2,26	11,76
	006	20	33,2			2,47	14,88
	010	18	21,1	0,13		2,77	19,79
	012	16	15,8			2,97	23,81
	020	14	10,9		0,18	3,40	33,04
	030	12	6,8			3,83	45,09
2	001 [b]	26	153,5	0,10	0,15	3,02	12,95
	002 [b]	24	109,2			3,28	16,37
	004	22	61,8			3,58	20,69
	006	20	34,2			4,01	27,09
	010	18	21,7	0,13		4,57	36,46
	012	16	16,3			4,98	42,86
	020	14	11,2		0,18	5,92	61,61
	030	12	7,0			6,83	85,43
3	001 [b]	26	153,5	0,10	0,15	3,17	16,82
	002 [b]	24	109,2			3,45	21,43
	004	22	61,8			3,78	27,53
	006	20	34,2			4,24	36,76
	010	18	21,7	0,13		4,85	49,11
	012	16	16,3			5,31	59,83
	020	14	11,2		0,18	6,31	85,72
	030	12	7,0			7,29	121,00
4	001 [b]	26	153,5	0,10	0,15	3,50	26,19
	002 [b]	24	109,2			3,79	34,53
	004	22	61,8			4,17	34,53
	006	20	34,2			4,67	45,84
	010	18	21,7	0,13		5,36	63,25
	012	16	16,3		0,18	5,92	76,94
	020	14	11,2			7,01	111,46
	030	12	7,0			8,15	159,24

[a] AWG = Closest American Wire Gauge.

[b] Nickel plated copper alloy component conductor.

4.3 Colour coding of cores and jacket

See EN 4612-002.

5 Required characteristics

According to EN 2235 and EN 3475-100.

See Table 2.

Table 2 *(1 of 4)*

EN 3475-	Designation of the test	Details
201	Visual examination	Applicable
202	Mass	Applicable, see Table 1.
203	Dimensions	Applicable, see Table 1.
–	Lay Factor	Less than 3 (three) in accordance with Annex A (normative).
–	Screen coverage EN 2235	Applicable not less than 85 % in accordance with Annex A (normative).
301	Ohmic resistance per unit length	Applicable, see Table 1.
302	Voltage proof test	Applicable
303	Insulation resistance	Applicable (20 ± 2) °C, 500 MΩ.km minimum. (95 ± 2) °C, 1 MΩ.km minimum.
304	Surface resistance	Not applicable
305	Overload resistance	Not applicable
401	Accelerated ageing	Applicable Temperature (200 ± 3) °C
402	Shrinkage and delamination	Applicable Temperature (150 ± 5) °C Maximum shrinkage at each end of cable: Jacket: — 2 mm on sizes 001 to 010, — 3 mm on sizes 012 to 030. Cores: — 0,80 mm on sizes 001 to 006, — 1,00 mm on sizes 010 to 012, — 1,20 mm on sizes 020 to 030.