

SLOVENSKI STANDARD

SIST EN 4612-013:2012

01-februar-2012

Aeronavtika - Kabli, električni, za splošne namene, eno- in večžilni - Družina XLETFE - Oplaščeni ali zaslonjeni in oplaščeni - 013. del: SX, TC in UC - Ponikljani baker - Obratovalne temperature med -65 °C in 135 °C - Enojno ekstrudirana izolacija samo za opremo, s plaščem in zaslonom (povitje) - Potiskljiva z UV-laserjem - Standard za izdelek

Aerospace series - Cables, electrical, for general purpose, single and multicore assembly - XLETFE Family - Jacketed or screened and jacketed - Part 013: SX, TC and UC - Nickel plated copper - Operating temperatures, between - 65 °C and 150 °C - Single extruded wall for equipment only, with jacket and screen (spiral) - UV laser printable - Product standard

[SIST EN 4612-013:2012](http://standards.iten.si/sist-en-4612-013-2012)

Luft- und Raumfahrt - Ein- und mehradrige elektrische Leitungen für allgemeine Verwendung - XLETFE Familie - Mit Mantel oder geschirmt und Mantel - Teil 013: SX, TC und UC - Kupfer vernickelt - Betriebstemperaturen zwischen – 65 °C und 150 °C - Einfach extrudierte Isolierung nur für Geräteverdrahtung, mit Mantel und Schirm (Umseilung) - UV-Laser bedruckbar - Produktnorm

Série aéronautique - Câbles, électriques, d'usage général, mono et multiconducteurs - Famille XLETFE - Gainés ou blindés et gainés - Partie 013: SX, TC et UC - Cuivre nickelé - Températures de fonctionnement comprises entre – 65 °C et 150 °C - Fil simple isolé pour circuits électriques uniquement, gainé et blindé (guipé) - Marquable au laser UV - Norme de produit

Ta slovenski standard je istoveten z: EN 4612-013:2011

ICS:

49.060

Letalska in vesoljska
električna oprema in sistemi

Aerospace electric
equipment and systems

SIST EN 4612-013:2012

en,fr

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 4612-013

October 2011

ICS 49.060

English Version

Aerospace series - Cables, electrical, for general purpose, single and multicore assembly - XLETFE Family - Jacketed or screened and jacketed - Part 013: SX, TC and UC - Nickel plated copper - Operating temperatures, between - 65 °C and 150 °C - Single extruded wall for equipment only, with jacket and screen (spiral) - UV laser printable - Product standard

Série aérospatiale - Câbles, électriques, d'usage général, mono et multiconducteurs - Famille XLETFE - Gainés ou blindés et gainés - Partie 013: SX, TC et UC - Cuivre nickelé - Températures de fonctionnement comprises entre - 65 °C et 150 °C - Fil simple isolé pour circuits électriques uniquement, gainé et blindé (guipé) - 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 013: SX, TC und UC - Kupfer vernickelt - Betriebstemperaturen zwischen - 65 °C und 150 °C - Einfach extrudierte Isolierung nur für Geräteverdrahtung, mit Mantel und Schirm (Umseilung) - UV-Laser bedruckbar - Produktnorm

PRESTANDARD PREVIEW
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This European Standard was approved by CEN on 20 August 2011.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This document (EN 4612-013:2011) 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 April 2012, and conflicting national standards shall be withdrawn at the latest by April 2012.

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

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard 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 $-65\text{ }^{\circ}\text{C}$ and $150\text{ }^{\circ}\text{C}$, operating at voltages not exceeding 600 V r.m.s and frequencies not exceeding 2 000 Hz. These cables are suitable for airframe use without additional protection. In case of conflict between this standard and other referenced documents the requirements of this standard shall take precedence.

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 alloys conductors for electrical cables — Product standard*

EN 2235, *Aerospace series — Single and multicore electrical cables, screened and jacketed*

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

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 $-65\text{ }^{\circ}\text{C}$ and $150\text{ }^{\circ}\text{C}$ — 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 standard¹⁾*

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

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

3 Terms, definitions and symbols

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

4 Materials and construction

4.1 Materials

These cables shall consist of the following:

- cores according to EN 4611-009;
- number of cores 1 (one) to 3 (three).

1) Published as ASD-STAN Prestandard at the date of publication of this standard (www.asd-stan.org).

2 (two) core to 3 (three) 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 — Multicore screened and jacketed

Number of cores and type code	Code for nominal section	AWG	Linear resistance at 20 °C Ω/km max.	Screen strands nominal diameter mm	External diameter mm max.	Mass kg/km max.
1, SX	002 ^b	24	114,0	0,08	1,54	6,22
	004	22	60,0		1,69	7,70
	006	20	33,2		1,94	11,28
	010	18	21,1		2,20	15,70
2, TC	002 ^b	24	117,4	0,08	2,40	10,69
	004	22	61,8		2,77	14,04
	006	20	34,2	0,10	3,34	20,26
	010	18	21,7		3,84	30,53
3, UC	002 ^b	24	117,4	0,08	2,60	15,55
	004	22	61,8		2,94	20,66
	006	20	34,2	0,10	3,55	32,66
	010	18	21,7		4,10	46,64
^a AWG = Closest American Wire Gage.						
^b Nickel plated copper alloy conductor.						

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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

EN 3475-	Test	Details
201	Visual examination	Applicable
202	Mass	Applicable; see Table 1.
203	Dimensions	Applicable; see Table 1.
–	Lay Factor	Less than 3 in accordance with Annex A
–	Screen coverage, see EN 2235.	Applicable
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 size 002 to 010 Cores: 0,80 mm on size 002 to 006 1,00 mm on size 010
403	Delamination and blocking	Applicable Temperature (150 ± 5) °C

continued

Table 2 (continued)

EN 3475-	Test	Details
404	Thermal shock	Applicable Temperatures (-65 ± 2) °C and (260 ± 5) °C Maximum shrinkage at each end of cable: Jacket: 2 mm on size 002 to 010 Cores: 0,80 mm on size 002 to 006 1,00 mm on size 010
405	Bending at ambient temperature	Applicable
406	Cold bend test	Applicable Temperature (-65 ± 2) °C
407	Flammability	Applicable Methods 1 and 2 Flame application 15 s Extinguishing time: 3 s max.
408	Fire resistance	Not applicable
409	Air-excluded ageing	Not applicable
410	Thermal endurance	Not applicable
411	Resistance to fluids	Applicable single core cable only No crazing or delamination, 5 % maximum swell, colour changes or removal of marking
412	Humidity resistance	Applicable Method B Temperature (90 ± 2) °C Duration 672 hours
413	Wrap back test	Not applicable
414	Differential scanning calorimeter (DSC test)	Not applicable
501	Dynamic cut-through	Not applicable
502	Notch propagation	Not applicable

continued