SLOVENSKI STANDARD
oSIST prEN 2267-012:2022

01-september-2022

Aeronavtika - Električni kabli za splošno uporabo - Delovne temperature med –55 °C in 260 °C - 012. del: Družina DZ, enožilni kabli z možnostjo UV-laserskega tiskanja za uporabo v nizkotlačni atmosferi - Standard za proizvod

Aerospace series - Cables, electrical, for general purpose - Operating temperatures between -55 °C and 260 °C - Part 012: DZ family, single UV laser printable for use in low pressure atmosphere - Product standard

Luft- und Raumfahrt - Leitungen, elektrisch, für allgemeine Verwendung - Betriebstemperaturen zwischen -55 °C und 260 °C - Teil 012: DZ-Familie, einadrige Leitungen, UV-Laser-bedruckbar, zur Anwendung bei niedrigem Luftdruck - Produktnorm

Série aérospatiale - Câbles, électriques, d'usage général - Températures de fonctionnement comprises entre -55 °C et 260 °C - Partie 012 : Famille DZ, fil simple marquable au laser UV pour emploi en basse pression - Norme de produit

Ta slovenski standard je istoveten z: **prEN 2267-012**

ICS:

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

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 2267-012

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ICS

Will supersede EN 2267-012:2015

English Version

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ASD-STAN.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 2267-012:2022) 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 document has received the approval of the National Associations and the Official Services of the member countries of ASD-STAN, prior to its presentation to CEN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 2267-012:2015.

For a list of the changes between prEN 2267-012:2022 and EN 2267-012:2015, see Annex A.

1 Scope

This document specifies the characteristics of UV laser printable electrical wires DZ family for use in the on board:

— 115 V (phase to neutral) or 200 V (phase to phase) electrical network of aircraft;

— 230 V (phase to neutral) or 400 V (phase to phase) electrical network of aircraft and particularly use in non-pressurized areas.

This cable family is used at operating temperature between -65 °C and 260 °C. These cables are demonstrated to be arc resistant for both networks (115 V and 230 V).

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 2084:2018, *Aerospace series - Cables, electrical, general purpose, with conductors in copper or copper alloy - Technical specification*

EN 2267-002, *Aerospace series - Cables, electrical, for general purpose - Operating temperatures between -55 °C and 260 °C - Part 002: General*

EN 3475-100:2010, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 100: General*

EN 3475-201, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 201: Visual examination*

EN 3475-202, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 202: Mass*

EN 3475-203, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 203: Dimensions*

EN 3475-301, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 301: Ohmic resistance per unit length*

EN 3475-302, *Aerospace series - Cable, electrical, aircraft use - Test methods - Part 302: Voltage proof test*

EN 3475-303, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 303: Insulation resistance*

EN 3475-304, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 304: Surface resistance*

EN 3475-305, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 305: Overload resistance*

EN 3475-306, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 306: Continuity of conductors*

EN 3475-307, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 307: Corona extinction voltage*

EN 3475-401, *Aerospace series - Cables, electrical, aircraft use - Test Methods - Part 401: Accelerated ageing*

EN 3475-402, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 402: Shrinkage and delamination*

EN 3475-403, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 403: Delamination and blocking*

EN 3475-404, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 404: Thermal shock*

EN 3475-405, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 405: Bending at ambient temperature*

EN 3475-406, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 406: Cold bend test*

EN 3475-407, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 407 : Flammability*

EN 3475-410, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 410: Thermal endurance*

EN 3475-411, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 411: Resistance to fluids*

EN 3475-412, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 412: Humidity resistance*

EN 3475-413, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 413: Wrap back test*

EN 3475-414, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 414: Differential scanning calorimeter (DSC test)*

EN 3475-501, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 501: Dynamic cut-through*

EN 3475-502, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 502: Notch propagation*

EN 3475-503, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 503: Scrape abrasion*

EN 3475-504, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 504: Torsion*

EN 3475-505, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 505: Tensile test on conductors and strands*

EN 3475-506, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 506: Plating continuity*

EN 3475-507, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 507: Adherence of plating*

EN 3475-508, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 508: Plating thickness*

EN 3475-601, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 601: Smoke density*

EN 3475-602, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 602: Toxicity*

EN 3475-604, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 604: Resistance to dry arc propagation*

EN 3475-605, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 605: Wet short circuit test*

EN 3475-701, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 701: Strippability and adherence of insulation to the conductor*

EN 3475-703, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 703: Permanence of manufacturer's marking*

EN 3475-704, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 704: Flexibility*

EN 3475-705, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 705: Contrast measurement*

EN 3475-706, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 706: Laser markability*

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

EN 4434:2005, *Aerospace series - Copper or copper alloy lightweight conductors for electrical cables - Product standard (Normal and tight tolerances)*

EN 9133, *Aerospace series - Quality Management Systems - Qualification Procedure for Aerospace Standard Products*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 3475-100:2010 apply.

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

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

4 Materials and construction

4.1 Materials

4.1.1 Conductor

These cable conductors shall be made of copper or copper alloy and nickel plated (code D) according to EN 4434:2005, Table 2 (tight tolerances) for 001 to 140 section codes.

4.1.2 Insulation

All size codes shall be defined to satisfy all required characteristics of Clause 5.

The use of foamed insulation material is forbidden.

To minimize partial discharges effect:

— size and number of cavities (gas trap) inside the insulation shall be as low as possible;

— at minimum bend radius, there shall be no wrinkles outside the insulation (EN 3475-405).

Minimum bend radius shall be in accordance with bending diameter given in Table 4 of EN 2084:2018.

It shall be possible to mark the outer layer of the insulation by UV laser printing.

4.2 Construction

It shall be according to EN 4434 and Table 1.

Proposition to add new Variant code for lightweight version by introducing “L” in section code and to be controlled and specified in Table 1 below.

Table 1

Code for nominal section	**Nominal section** mm²	**AWG** [a]	**Linear resistance at 20 °C** Ω/km max.	**External diameter** mm min.	mm max.	**Mass** kg/km max.
012	1,2	16	14,5	2,38	2,70	23
L12[b]	1,2	16	14,5	2,30	2,60	20,5
030	3	12	6,8	3,23	3,61	41
L30[b]	3	12	6,8	2,85	3,25	37,5
051	5	10	4,1	3,68	4,21	62
L51[b]	5	10	4,1	3,40	3,90	57,5
090	9	8	2.3	4,35	4,95	102

[a] AWG = closest American Wire Gauge.

[b] L code specifies Light weight version with optimised AWG diameter.

4.3 Number of cores

This document specifies a UV laser markable single core.

4.4 Colour coding of cores

It shall be according to EN 2267-002.

5 Required characteristics

According to EN 2084 and EN 3475-100.

See Table 2.

Table 2 *(1 of 4)*

EN 3475-	Test	Details
201	Visual examination	Applicable including laser marked specimen
202	Mass	Applicable; see Table 1
203	Dimensions	Applicable; see 4.2 and Table 1
301	Electrical resistance per unit length	Applicable; see Table 1
302	Voltage proof test	Applicable with — immersion test 2,5 kV r.m.s. (non-delivered samples) — dry spark test 2,5 kV r.m.s. — dry impulse test 4,0 kV r.m.s.
303	Insulation resistance	Applicable
304	Surface resistance	Applicable
305	Overload resistance	Applicable T_1 = (310 ± 5) °C; T_2 = (450 ± 5) °C
306	Continuity of conductors	Applicable
307	Corona extinction voltage	Applicable prior to each delivery — Method B at 45 000 feet (145 mbar) and 150 °C PDIV ≥ 566 V r.m.s. (800 V peak), PDEV ≥ 509 V r.m.s. (720 V peak)
401	Accelerated ageing	Applicable Temperature (310 ± 5) °C