SLOVENSKI STANDARD
SIST EN 4641-301:2011

01-november-2011

Aeronavtika - Optični kabli, premer vlakna z oklepom 125 µm - 301. del: Kompaktna struktura 50/125 µm GI, imenski zunanji premer kabla 1,8 mm - Standard za izdelek

Aerospace series - Cables, optical 125 µm diameter cladding - Part 301: Tight structure 50/125 µm GI fibre nominal 1,8 mm outside diameter - Product standard

Luft- und Raumfahrt - Lichtwellenleiterkabel, Claddingdurchmesser 125 µm - Teil 301: Festaderaufbau GI 50/125µm, Faser Kabelaußendurchmesser 1,8 mm - Produktnorm

Série Aérospatiale - Câbles, optiques, diamètre extérieur de la gaine optique 125 µm - Partie 301 : Câble à structure serrée, fibre à gradient d'indice 50/125 µm, diamètre extérieur 1,8 mm - Norme de produit

Ta slovenski standard je istoveten z: **EN 4641-301:2011**

ICS:

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

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EUROPEAN STANDARD

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 4641-301:2011) 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of an identical text or by endorsement, at the latest by November 2011, and conflicting national standards shall be withdrawn at the latest by November 2011.

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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.

1 Scope

This product standard specifies the general characteristics, conditions for qualification, acceptance and quality assurance for a fibre optic cable with a 50/125 µm Graded Index fibre core, 1,8 mm outside diameter for non pull-proof contact designs.

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 2424, *Aerospace series — Marking of aerospace products*

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

EN 3745 (all parts), *Aerospace series — Fibres and cables, optical, aircraft use — Test methods*

EN 3909, *Aerospace series — Test fluids and test methods for electric components and sub-assemblies*

EN 4641-001, *Aerospace series — Cables, optical, 125 µm diameter cladding — Part 001: Technical specification*

TR 4667, *Aerospace series — Termination procedure for EN 4639 optical contact* [1)]

3 Terms, definitions, symbols and abbreviations

For the purposes of this document, the terms, definitions, symbols and abbreviations detailed in EN 3745-100 apply.

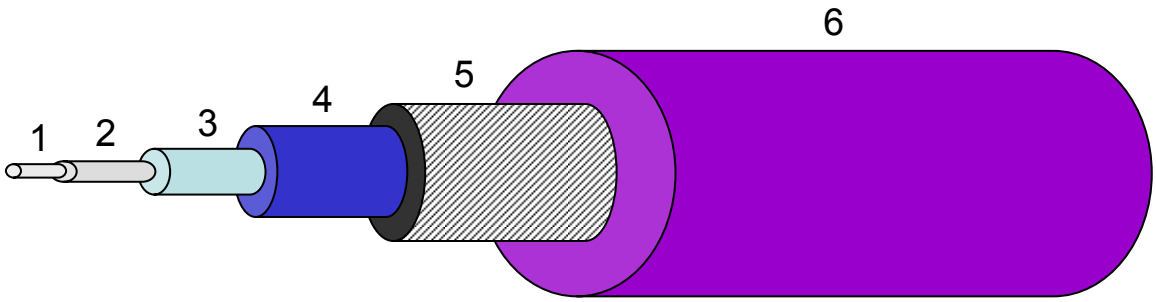
4 Required characteristics

The characteristics of the cables, tested according to the methods described hereafter shall comply with the values defined in this product standard.

1) Published as ASD-STAN Technical Report at the date of publication of this standard by Aerospace and Defence Industries Association of Europe-Standardization (ASD-STAN), (www.asd-stan.org).

5 Cable construction

See Figure 1 and Table 1.



Key

1 Core
2 Cladding
3 Primary buffer
4 Secondary buffer
5 Strength member
6 Outer jacket

Figure 1

Table 1

Property	Value
Core diameter	(50 ± 3,0) µm
Cladding diameter	(125 ± 2,0) µm
Core/cladding concentricity	≤ 3 µm
Core non circularity	≤ 5 %
Cladding non circularity	≤ 2 %
Primary buffer	(245 ± 15) µm
Attenuation at 850 nm (20 °C)	< 5 dB/km
Attenuation at 1300 nm (20 °C)	< 3 dB/ km
Finished cable diameter	(1,80 ± 0,1) mm
Cable mass	≤ 5 kg/km
Operating temperature	– 60 °C to 135 °C
Minimum bend radius (20 °C)	Installation: 20 mm (10 × outside diameter) Long term: 20 mm (10 × outside diameter) Storage: 40 mm (20 × outside diameter)
Strength member weave pitch	3 mm < p < 20 mm
Tensile strength	> 200 N

6 Materials

See Table 2.

Table 2

Element		Material
Fibre	Core	Silica
	Cladding	
Primary buffer		High Temperature Polyacrylate
Secondary buffer		High Temperature Polymer(s)
Mechanical strength reinforcement		Aramid/Aramid-Fibreglass Woven Braid
Jacket(s)		High Temperature Polymer

7 Test methods and performances

7.1 Tests in accordance with EN 3745-100

7.1.1 Optical fibre

See Table 3.

Table 3 — Optical fibre performance requirements

Test method EN 3745-	Designation of test	Test conditions and results
201	Fibre visual examination	Pass
202	Fibre core dimension	Method A: core diameter = (50 ± 3) µm
501	Optical fibre proof test	> 1 %
202	Fibre cladding dimension	Cladding diameter: (125 ± 2) µm Method A or B Sample should be in accordance with test methods Number of sample: 1
203	Primary coating outside diameter	Not applicable
202	Fibre dimension core non circularity	Core non circularity : ≤ 5 % (3 µm) Number of sample: 1
202	Fibre dimension cladding non circularity	Cladding non circularity : ≤ 2 % (2,5 µm) Number of sample: 1

continued

Table 3 — Optical fibre performance requirements *(concluded)*

Test method EN 3745-	Designation of test	Test conditions and results
202	Fibre dimension concentricity error	Concentricity error ≤ 3 µm Number of sample: 1
301 Method A	Fibre attenuation	Maximum attenuation: ≤ 5 dB/km at 850 nm, ≤ 3 dB/km at 1 300 nm at 20 °C Minimum sample length: 100 m
302	Numerical aperture	Numerical aperture: 0,2 ± 0,015 at λ = (850 ± 20) nm Sample length: 2 m
303	Bandwidth	Bandwidth ≥ 500 MHz/km at 850 nm ≥ 500 MHz/km at 1 300 nm Number of sample: 1 Minimum sample length: 1 km Central wavelengths: (850 ± 10) nm (1 300 ± 10) nm Spectral width (– 3 dB): ≤ 10 nm for 850 nm

7.1.2 Fibre optic cable

See Table 4.

Table 4 — Fibre optic cable performance requirements

Test method EN 3745-	Designation of test	Test conditions and results
201	Visual Inspection	The outer jacket shall have the correct identification as specified in this standard. The jacket shall be continuous and free of visible defects such as lumps, abrasions, cracks, splits or blisters. Number of sample: 1 Sample length: 3 m.
203	Buffer diameter	(925 ± 75) µm
203	Outer jacket outside diameter	(1,80 ± 0,1) mm
205 Method A	Longitudinal stability	Visual examination in accordance with EN 3745-201 Shrinkage or elongation < 0,5 % Sample length: 5 m Number of samples: 1 Number of temperature cycles (EN 3745-402): 25.
301 Method A	Cable attenuation	Maximum attenuation: ≤ 5 dB/km at 850 nm, ≤ 3 dB/km at1 300 nm at 20 °C. Minimum sample length: 200 m.

continued