SLOVENSKI STANDARD
SIST EN 4641-102:2009

01-maj-2009

Aeronavtika - Kabli, optiļ ni, zunanji premer obloge 125 Õm - 102. del: Poltrdi kabli lahke izvedbe GI 62,5/125 Õm, zunanji premer vlakna 1,8 mm - Standard za proizvod

Aerospace series - Cables, optical 125 εm outside diameter cladding - Part 102: Semi-loose 62,5/125 Õm GI fibre nominal 1,8 mm outside diameter - Product standard

Luft- und Raumfahrt - Lichtwellenleiterkabel, Claddingdurchmesser 125 µm - Teil 102: Halbfester Leiteraufbau GI 62,5/125 µm, Faser Kabelaußendurchmesser 1,8 mm - Produktnorm

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Série aérospatiale - Câble, optique, diamètre extérieur de la gaine optique 125 µm - Partie 102 : Câble à structure semi libre, fibre à gradient d'indice 62,5/125 µm, diamètre extérieur 1,8 mm - Norme de produit

Ta slovenski standard je istoveten z: EN 4641-102:2009

ICS:

49.060	Letalska in vesoljska elektriļ na oprema in sistemi	Aerospace electric equipment and systems

SIST EN 4641-102:2009 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 4641-102

February 2009

ICS 49.060

English Version

Aerospace series - Cables, optical 125 µm outside diameter cladding - Part 102: Semi-loose 62,5/125 µm GI fibre nominal 1,8 mm outside diameter - Product standard

Série aérospatiale - Câble, optique, diamètre extérieur de la gaine optique 125 µm - Partie 102 : Câble à structure semi libre, fibre à gradient d'indice 62,5/125 µm, diamètre extérieur 1,8 mm - Norme de produit

Luft- und Raumfahrt - Lichtwellenleiterkabel, Claddingdurchmesser 125 µm - Teil 102: Halbfester Leiteraufbau GI 62,5/125 µm, Faser Kabelaußendurchmesser 1,8 mm - Produktnorm

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Ref. No. EN 4641-102:2009: E

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Foreword

This document (EN 4641-102:2009) 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 2009, and conflicting national standards shall be withdrawn at the latest by August 2009.

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1 Scope

This product standard specifies the general characteristics, conditions for qualification, acceptance and quality assurance for a fibre optic cable with a 62,5/125 µm Graded Index fibre nominal, 1,8 mm outside diameter and of semi-loose buffer construction.

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 2812, *Aerospace series — Stripping of electrical cables* [1]

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

EN 3745-100*, *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 100: General*

EN 3838, *Aerospace series — Requirements and tests on user-applied markings on aircraft electrical cables* [1]

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* [1]

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

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ISO 1817, *Rubber, vulcanized — Determination of the effect of liquids*

ISO 11075, *Aircraft — De-icing/anti-icing fluids — ISO type I*

ISO 11078, *Aircraft — De-icing/anti-icing fluids — ISO types II, III and IV*

TR 4647, *Aerospace series — Fibres and cables, optical aircraft use — Technical Report — Termination procedure for EN 4639 contact* [2]

STANAG 3748, *Hydraulic fluid, petroleum (H-515, H-520 and C-635) and polyalphaolefin (H-537, H-538 and H-544)* [3]

MIL-PRF-87252C, *Coolant fluid, hydrolytically stable, dielectric* [4]

AMS 1428, *Fluid, aircraft deicing/Anti-icing, non-Newtonian (pseudoplastic), SAE types II, III, and IV* [5]

NSA 307110, *Fluid — Hydraulic phosphate ester — Base fire resistant*

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* And all parts quoted in this standard.

1 Published as ASD Prestandard at the date of publication of this standard.

2 In preparation at the date of publication of this standard.

3 Published by: NATO Military Agency for Standardization (MAS); B-1110 Brussels, Belgium.

4 Published by: Department of Defense (DoD), the Pentagon, Washington, DC 20301, USA.

5 Published by: Society of Automotive Engineers, Inc. (SAE), 400 Commonwealth Drive, Warrendale, PA 15096-0001, USA.

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3 Terms and definitions

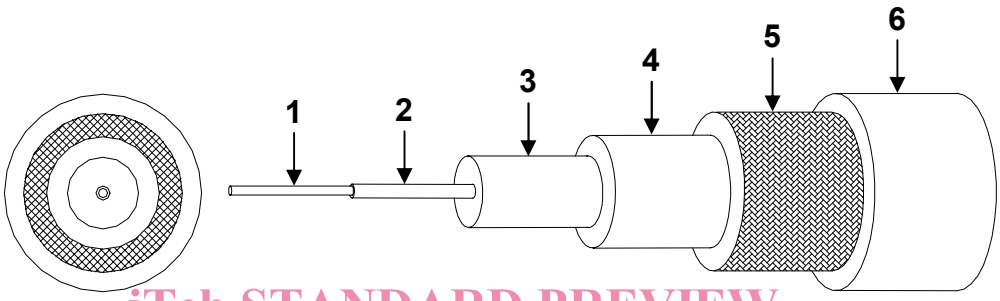
For the purposes of this document, the terms and definitions given in EN 3745-100 apply.

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.

5 Cable construction

See Figure 1 and Table 1.



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Key

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

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Figure 1

Table 1

Property	Value
Core	(62,5 ± 3,0) µm
Cladding	(125 ± 2,0) µm
Primary coating	(245 ± 5) µm
Finished cable diameter	(1,88 ± 0,12) mm
Cable mass	≤ 4,65 g/m
Operating temperature	– 65 °C to 150 °C
Attenuation at 850 nm (20 °C)	< 4 dB/km
Attenuation at 1 300 nm (20 °C)	< 2 dB/km
Numerical aperture	0,275 ± 0,015
Minimum bend radius (20 °C)	Installation: 20 mm (10 × outside diameter) Long term: 20 mm (10 × outside diameter) Storage: 40 mm (20 × cable outside diameter)
Tensile strength	> 200 N

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6 Materials

See Table 2.

Table 2

Element		Material
Fibre	Core	Silica
	Cladding	
Primary coating		Polyacrylate
Primary buffer		PTFE
Secondary buffer		Polyimide
Barrier layer		PTFE (Non-sealed)
Mechanical strength reinforcement		Aramid/Fibre glass woven braid
Outer jacket		Extruded fluoropolymer

7 Test methods and performances

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7.1 Tests in accordance with EN 3745-100

7.1.1 Optical fibre

See Table 3.

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Table 3 — Optical fibre test methods

Designation of test	Test method EN 3745-	Test conditions and results
Fibre visual examination	201	Pass
Fibre dimensions	202	Method D: Core diameter: (62,5 ± 3) µm
Optical fibre proof test	501	> 1 %
Attenuation	301 Method D	Maximum attenuation ≤ 4 dB/km at 850 nm, ≤ 2 dB/km at 1 300 nm at 20 °C Minimum sample length: 100 m
Numerical aperture	302	Numerical aperture: 0,275 ± 0,015 at λ = (850 ± 20) nm Sample length: 2 m
Bandwidth	303	Bandwidth ≥ 200 MHz/km at 850 nm Bandwidth ≥ 600 MHz/km at 1 300 nm Number of samples: 1 Minimum sample length: 1 km Central wavelengths: (850 ± 10) nm, (1 300 ± 10) nm Spectral width (– 3 dB): ≤ 10 nm for 850 nm and 1 300 nm

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7.1.2 Fibre optic cable

See Table 4.

Table 4 — Fibre optic cable test methods

Designation of test	Test method EN 3745-	Test conditions and results
Visual examination	201	The outer jacket shall have the correct identification as specified in this standard. The coating shall be continuous and free of visible defects such as lumps, abrasions, cracks, splits or blisters. Number of samples: 1 – Sample length: 3 m
Primary coating outside diameter	203	(245 ± 5) µm
Buffer diameter	203	(915 ± 60) µm
Outer jacket outside diameter	203	(1,88 ± 0,12) mm
Outer jacket wall thickness	203	Minimum wall: ≥ 0,10 mm
Longitudinal stability	205	Change in longitudinal dimensions between *A* and *B*: ≤ 5 mm Number of samples: 3 – Sample Length: (3,5 ± 0,03) m Perform temperature cycling – Test method EN 3745-402 – 25 cycles
Attenuation	301 Method D	Maximum attenuation ≤ 4 dB/km at 850 nm, ≤ 2 dB/km at 1 300 nm at 20 °C Minimum sample length: 100 m
Cable immunity to ambient light	305	Level of optical power ≤ – 50 dBm Sample length exposed to light source: 10 m
Attenuation during temperature cycling	306/402	Visual examination in accordance with EN 3745-201. Maximum variation of attenuation: α ≤ 0,25 dB at 850 nm and 1 300 nm Test method EN 3745-402 – 10 cycles High temperature: 150 °C – Low temperature: – 65 °C Duration at extreme temperatures: 30 minutes Rate of change: 5 °C per minute Number of samples: 3 – Sample length: 30 m
Cable accelerated aging	401	Visual examination in accordance with EN 3745-201. Maximum variation in attenuation: < 0,25 dB Maximum variation in attenuation after 24 h: < 0,25 dB Residual maximum variation in attenuation: < 0,2 dB Mandrel diameter: 250 mm Test temperature: 150 °C – Number of temperature cycles: 1 Number of samples: 1 – Sample length: (100 ± 0,05) m

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