
Aeronavtika - Kabli, optični, zunanji premer obloge 125 µm - 104. del: Poltrdi kabli lahke izvedbe 62,5/125 µm, zunanji premer vlakna 4,95 mm - Standard za izdelek

Aerospace series - Cables, optical 125 µm diameter cladding - Part 104: Semi-loose, ruggedized duplex construction 62,5/125 µm GI fibre nominal, 4,95 mm outside diameter - Product standard

Luft- und Raumfahrt - Lichtwellenleiterkabel, Claddingdurchmesser 125 µm - Teil 104: Halbfester Leiteraufbau GI 62,5/125 µm, Faser Kabelaußendurchmesser 4,95 mm - Produktnorm
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Série aérospatiale - Câble optique, diamètre extérieur de la gaine optique 125 µm - Partie 104 : Câble à structure semi libre renforcée, double voie fibre à gradient d'indice 62,5/125 µm, diamètre extérieur 4,95 mm - Norme de produit

Ta slovenski standard je istoveten z: EN 4641-104:2010

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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EN 4641-104

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ICS 49.060

English Version

**Aerospace series - Cables, optical 125 μm diameter cladding -
Part 104: Semi-loose, ruggedized duplex construction 62,5/125
 μm GI fibre nominal, 4,95 mm outside diameter - Product
standard**

Série aérospatiale - Câble, optique, diamètre extérieur de la gaine optique 125 μm - Partie 104 : Câble à structure semi-libre, renforcée, double voie fibre à gradient d'indice 62,5/125 μm , diamètre extérieur 4,95 mm - Norme de produit

Luft- und Raumfahrt - Lichtwellenleiterkabel, Claddingdurchmesser 125 μm - Teil 104: Halbfester Leiteraufbau GI 62,5/125 μm , Faser Kabelaußendurchmesser 4,95 mm - Produktnorm

This European Standard was approved by CEN on 2 July 2010.

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 4641-104:2010) 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 May 2011, and conflicting national standards shall be withdrawn at the latest by May 2011.

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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EN 4641-104:2010 (E)**1 Scope**

This product standard specifies the general characteristics, conditions for qualification, acceptance and quality assurance for a fibre optic cable with two 62,5/125 μm graded index fibre cores, 4,95 mm nominal outside diameter and of semi-loose construction. The basic construction is a pair of the cables defined in EN 4641-102 with added sheaths for ruggedized usages.

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

EN 4641-102, *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*

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

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TR 4647, *Aerospace series — Termination procedure for EN 4639 optical contact* ²⁾

3 Terms and definitions

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

4 Required characteristics

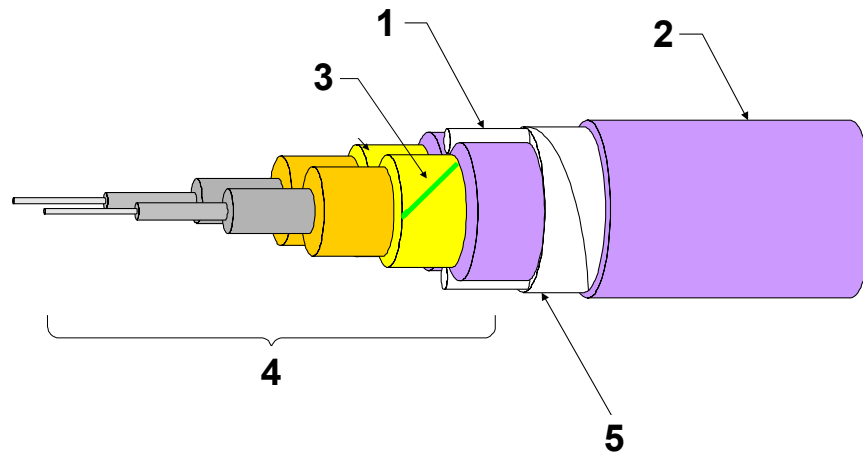
The characteristics of the cables, tested according to the methods described hereafter shall comply with the values defined in this product standard.

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), (www.asd-stan.org).

2) 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 Filler – 2 places
- 2 Jacket – Extruded fluoropolymer
- 3 Green tracer or laser ID
- 4 EN 4641-102 fibre cable
- 5 PTFE barrier tape

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Figure 1

Table 1

Property	Value
EN 4641-102 — Fibre optic cable	(1,80 ± 1,2) mm
Finished cable diameter	4,95 mm
Cable mass	26,5 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: 50 mm (10 × outside diameter) Long term: 50 mm (10 × outside diameter) Storage: 100 mm (20 × cable outside diameter)

6 Materials

See Table 2.

Table 2

Element	Material
2 - Fibre cable components	EN 4641-102 — Fibre optic cable
2 fillers	PTFE
Barrier tape	PTFE
Outer jacket	Extruded fluoropolymer

7 Test methods and performances in accordance with EN 3745-100

7.1 Optical fibre tests

In accordance with EN 4641-102.

7.2 Fibre optic component cable tests

In accordance with EN 4641-102.

7.3 Ruggedized fibre optic cable

Tests in accordance with Table 3.

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Table 3 — Ruggedized fibre optic cable test methods

Designation of the 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. Sample length: 3 m
Outer jacket outside diameter	203	$(4,95 \pm 0,25)$ mm
Outer jacket wall thickness	203	Minimum wall $\geq 0,20$ mm
Cable longitudinal dimensional stability	205	The change in longitudinal dimensions between A and B shall not exceed the maximum value of ≤ 5 mm. Number of samples: 3 – Sample Length: $(3,5 \pm 0,03)$ m Test Method EN 3745-402 – 25 cycles
Fibre 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 coupling	305	Not applicable. This is an EN 4641-102 component test.
Cable accelerated ageing	401	Not applicable if jacket materials are the same. This is an EN 4641-102 component test.

continued

Table 3 — Ruggedized fibre optic cable test methods (continued)

Designation of the test	Test method EN 3745-	Test conditions and results
Variation of attenuation during temperature cycling	306	Visual examination in accordance with EN 3745-201. Maximum variation of attenuation: $a \leq 0,25$ 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: ≥ 5 m
Thermal shock	404	Visual examination in accordance with EN 3745-201. Maximum permissible variation in attenuation during test sequence and after 24 h: $\Delta\alpha \leq 0,25$ dB at 850 nm and 1 300 nm. High temperature: 150 °C – Low temperature: – 65 °C Duration at extreme temperatures: 30 minutes Number of samples: 3 – Sample Length: ≥ 10 m Number of temperature cycles: 10
Cold bend	406	Maximum permissible variation in attenuation: $\Delta\alpha < 0,25$ dB at 850 nm and 1 300 nm. Visual examination in accordance with EN 3745-201. 1 hour soak at: – 65 °C – Mandrel size: (50 ± 1) mm Mandrel wraps: 10 Number of samples: 3 – Sample Length: ≥ 10 m
Flammability	407	No flaming particles shall fall from the sample during the test and the tissue paper shall not be ignited. Period of flame application: 30 seconds Maximum burn length: 75 mm – Self extinguish after 5 seconds Number of samples: 3 – Sample length: $(1 \pm 0,05)$ m
Thermal life	410	Not applicable if jacket materials are the same. This is an EN 4641-102 component test.
Resistance to fluids	411 Method 2	Not applicable if jacket materials are the same. This is an EN 4641-102 component test.
Humidity resistance	412	Not applicable if jacket materials are the same. This is an EN 4641-102 component test.
Scrape abrasion	503	Maximum variation in attenuation: $\Delta\alpha \leq 0,25$ dB at 850 nm and 1 300 nm. Visual examination in accordance with EN 3745-201. Number of samples: 3 – Sample length: ≥ 3 m Test at ambient temperature: Load: 7 N – Number of cycles: 500 Test at high temperature: 150 °C Load: 22 N – Number of cycles: 500

continued