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**Aeronavtika - Kabli, optični, zunanji premer obloge 125 µm - 103. del: Poltrdi kabli lahke izvedbe 62,5/125 µm GI, zunanji premer vlakna 2,74 mm - Standard za izdelek**

Aerospace series - Cables, optical 125 µm diameter cladding - Part 103: Semi-loose, ruggedized simplex construction 62,5/125 µm GI fibre nominal 2,74 mm, outside diameter - Product standard

Luft- und Raumfahrt - Lichtwellenleiterkabel, Claddingdurchmesser 125 µm - Teil 103: Halbfester Leiteraufbau, widerstandsfähige Simplexkonstruktion GI 62,5 µm/125 µm Faser, Kabelaußendurchmesser 2,74 mm - Produktnorm

Série aérospatiale - Câble, optique, diamètre extérieur de la gaine optique 125 µm - Partie 103 : Câble à structure semi libre, renforcée, monovoie fibre à gradient d'indice 62,5 µm/125 µm, diamètre extérieur 2,74 mm - Norme de produit

**Ta slovenski standard je istoveten z: prEN 4641-103**

**ICS:**

33.180.10	(Optična) vlakna in kabli	Fibres and cables
49.090	Oprema in instrumenti v zračnih in vesoljskih plovilih	On-board equipment and instruments

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 4641-103**

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ICS 49.090

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English Version

**Aerospace series - Cables, optical 125  $\mu\text{m}$  diameter  
cladding - Part 103: Semi-loose, ruggedized simplex  
construction 62,5/125  $\mu\text{m}$  GI fibre nominal 2,74 mm,  
outside diameter - Product standard**

Série aérospatiale - Câble, optique, diamètre extérieur  
de la gaine optique 125  $\mu\text{m}$  - Partie 103 : Câble à  
structure semi libre, renforcée, monovoie fibre à  
gradient d'indice 62,5  $\mu\text{m}$ /125  $\mu\text{m}$ , diamètre extérieur  
2,74 mm - Norme de produit

Luft- und Raumfahrt - Lichtwellenleiterkabel,  
Claddingdurchmesser 125  $\mu\text{m}$  - Teil 103: Halbfester  
Leiteraufbau, widerstandsfähige Simplexkonstruktion  
GI 62,5  $\mu\text{m}$ /125  $\mu\text{m}$  Faser, Kabelaußendurchmesser  
2,74 mm - Produktnorm

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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## European foreword

This document (prEN 4641-103:2023) 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 4641-103:2010.

The main changes with respect to the previous edition are as follows:

- EN 4641-103 (P1), 11/2010 — Editorial improvements and update of the scope to change “single mode fibre core” to “simplex fibre”.

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[oSIST prEN 4641-103:2023](https://standards.iteh.ai/catalog/standards/sist/14952d2d-2a3a-4b15-9099-9d32b4cd9b90/osist-pren-4641-103-2023)

<https://standards.iteh.ai/catalog/standards/sist/14952d2d-2a3a-4b15-9099-9d32b4cd9b90/osist-pren-4641-103-2023>

**prEN 4641-103:2023 (E)****1 Scope**

This document specifies the general characteristics, conditions for qualification, acceptance and quality assurance for a fibre optic cable with a 62,5 µm/125 µm simplex fibre, 2,74 mm outside cable diameter and of semi-loose construction. The basic construction is the cable defined in EN 4641-102 with added sheaths for ruggedized usages.

**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 2424, *Aerospace series - Marking of aerospace products*

EN 2812, *Aerospace series - Stripping of electric cables*

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

EN 3745-201, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 201: Visual examination*

EN 3745-203, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 203: Cable dimensions*

EN 3745-205, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 205: Cable longitudinal dimensional stability*

EN 3745-301, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 301: Attenuation*

EN 3745-306, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 306: Variation of attenuation during temperature cycling*

EN 3745-402, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 402: Temperature cycling*

EN 3745-404, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 404: Thermal shock*

EN 3745-406, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 406: Cold bend test*

EN 3745-407, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 407: Flammability*

EN 3745-503, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 503: Scrape abrasion*

- EN 3745-505, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 505: Cable tensile strength*
- EN 3745-506, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 506: Impact resistance*
- EN 3745-507, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 507: Cut-through*
- EN 3745-508, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 508: Torsion*
- EN 3745-509, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 509: Kink test*
- EN 3745-510, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 510: Bending test*
- EN 3745-511, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 511: Cable to cable abrasion*
- EN 3745-512, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 512: Flexure endurance*
- EN 3745-513, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 513: Crush resistance*
- EN 3745-516, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 516: Severe cable bend test*
- EN 3745-517, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 517: Cable tie clamping test*
- EN 3745-601, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 601: Smoke density*
- EN 3745-602, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 602: Toxicity*
- EN 3745-701, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 701: Strippability*
- EN 3745-703, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 703: Durability of manufacturer's marking*
- EN 3745-705, *Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 705: Contrast measurement*
- EN 3838, *Aerospace series - Requirements and tests on user-applied markings on aircraft electrical cables*
- EN 4641-001, *Aerospace series - Cables, optical, 125  $\mu\text{m}$  diameter cladding - Part 001: Technical specification*
- EN 4641-102, *Aerospace series - Cables, optical 125  $\mu\text{m}$  outside diameter cladding - Part 102: Semi-loose 62,5/125  $\mu\text{m}$  GI fibre nominal 1,8 mm outside diameter - Product standard*

**prEN 4641-103:2023 (E)**

TR 4647,<sup>1</sup> *Aerospace series — Termination procedure for EN 4639 optical contact*

**3 Terms and definitions**

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

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

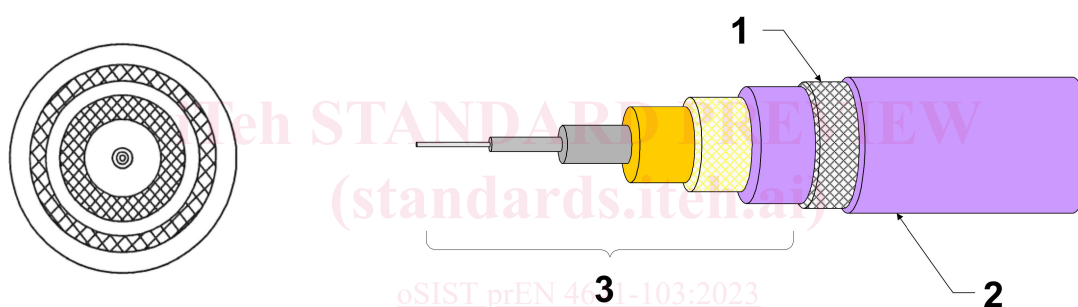
- ISO Online browsing platform: available at <https://www.iso.org/obp/>
- IEC Electropedia: available at <https://www.electropedia.org/>

**4 Required characteristics**

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

**5 Cable construction**

See Figure 1 and Table 1.

**Key**

- |   |                                 |
|---|---------------------------------|
| 1 | Glass braid                     |
| 2 | Jacket – Extruded fluoropolymer |
| 3 | EN 4641-102 fibre cable         |

**Figure 1**

<sup>1</sup> Published as ASD-STAN Technical Report at the date of publication of this document by AeroSpace and Defence industries Association of Europe — Standardization (ASD-STAN), <https://www.asd-stan.org/>.



**Table 1**

Property	Value
EN 4641-102 — Fibre optic cable	(1,80 ± 0,12) mm
Finished cable diameter	(2,74 ± 0,25) mm
Cable mass	10,7 g/m
Operating temperature	-65 °C to 150 °C
Attenuation at 850 nm (20 °C)	≤ 4,0 dB/km
Attenuation at 1 300 nm (20 °C)	≤ 2,0 dB/km
Numerical aperture	0,275 ± 0,015
Minimum bend radius (20 °C)	Installation: 27 mm (10 × outside diameter) Long term: 27 mm (10 × outside diameter) Storage: 54 mm (20 × cable outside diameter)

## 6 Materials

See Table 2.

**Table 2**

Element	Material
Fibre cable component	EN 4641-102 — Fibre optic cable
Overall braid	Fibre glass woven braid
Outer jacket	Extruded fluoropolymer

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

### 7.1 Optical fibre tests

Optical fibre tests shall be in accordance with EN 4641-102.

### 7.2 Fibre optic component cable tests

Fibre optic component cable tests shall be in accordance with EN 4641-102.

### 7.3 Ruggedized fibre optic cable

Tests shall be in accordance with Table 3.

Table 3 — Ruggedized fibre optic cable test methods (1 of 5)

Test	Test method EN 3745-	Test conditions and results
Visual examination	201	The outer jacket shall have the correct identification as specified in this document. 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	(2,74 ± 0,25) mm
Outer jacket wall thickness	203	Minimum wall ≥ 0,20 mm
Longitudinal 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 ± 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	305	Not applicable. This is a EN 4641-102 component test.
Attenuation during temperature cycling	306	Visual examination in accordance with EN 3745-201. Maximum variation of attenuation: $\alpha \leq 0,25$ 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: ≥ 20 m