
Aeronavtika - Kabli, optični, zunanji premer obloge vlakna 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, Mantelaußendurchmesser 125 µm - Teil
301: Fester Aufbau, 50/125 µm GI-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

[SIST EN 4641-301:2024](https://standards.iteh.ai/SIST/EN/4641-301/2024)

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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

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

This European Standard was approved by CEN on 19 May 2024.

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European foreword

This document (EN 4641-301:2024) has been prepared by 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 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2025, and conflicting national standards shall be withdrawn at the latest by February 2025.
- Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.
- This document supersedes EN 4641-301:2022.

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

- EN 4641-301 (P2), 03/2022 — General editorial improvements and update of Clause 2 with addition of references from the bibliography.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this document: 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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EN 4641-301:2024 (E)**1 Scope**

This document 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 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 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 3745-202, *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 202: Fibre dimensions*

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 3745-302, *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 302: Numerical aperture*

EN 3745-303, *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 303: Bandwidth*

EN 3745-305, *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 305: Immunity to ambient light coupling*

EN 3745-306,¹ *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 306: Variation of attenuation during temperature cycling*

EN 3745-401, *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 307: Accelerated ageing*

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

¹ Published as ASD-STAN prEN at the date of publication of this document, available at: <https://www/asd-stan.org/>.

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

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

EN 3745-410, *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 410: Thermal life*

EN 3745-411, *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 411: Resistance to fluids*

EN 3745-412, *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 412: Humidity resistance*

EN 3745-501, *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 501: Optical fibre proof test*

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

EN 3745-504, *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 504: Micro bending test*

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: Sensibilité à la pliure*

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 3745-517, *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 517: Cable tie clamping test*

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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: Mesure de contraste*

EN 4056-001, *Aerospace series — Cable ties for harnesses — Part 001: Technical specification*

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

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:

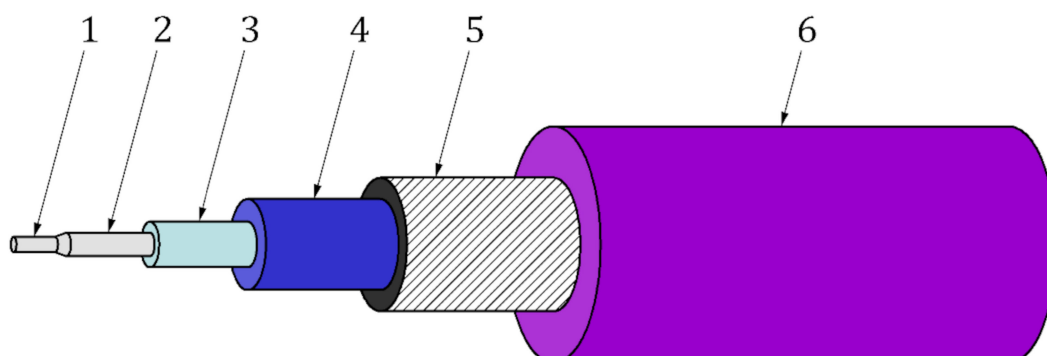
- ISO Online browsing platform: available at <https://www.iso.org/obp/>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Required characteristics

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

5 Cable construction

Cable construction shall be in accordance with Figure 1 and Table 1.



Key

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

Figure 1 — Cable construction

Table 1 — Cable dimensional information

Property	Value
Core diameter	$(50 \pm 3,0) \mu\text{m}$
Cladding diameter	$(125 \pm 2,0) \mu\text{m}$
Core/cladding concentricity	$\leq 3 \mu\text{m}$
Core non circularity	$\leq 5 \%$
Cladding non circularity	$\leq 2 \%$
Primary buffer	$(245 \pm 15) \mu\text{m}$
Attenuation at 850 nm (+ 20 °C)	$\leq 5 \text{ dB/km}$
Attenuation at 1 300 nm (+ 20 °C)	$\leq 3 \text{ dB/km}$
Finished cable diameter	$(1,80 \pm 0,1) \text{ mm}$
Cable mass	$\leq 5 \text{ kg/km}$
Operating temperature	$-60 \text{ °C to } 135 \text{ °C}$
Minimum bend radius (+ 20 °C)	Installation: 18 mm Long term: 18 mm Storage: 36 mm
Strength member weave pitch	$3 \text{ mm} \leq p \leq 20 \text{ mm}$
Tensile strength	$> 200 \text{ N}$

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6 Materials

Materials shall be in accordance with Table 2.

Table 2 — Cable materials

Element		Material
Fibre	Core	Silica
Fibre	Cladding	Silica
Primary buffer		Polyacrylate
Secondary buffer		Polymer
Mechanical strength reinforcement		Aramid/aramid-fibre glass
Jacket(s)		Polymer

7 Test methods and performances

7.1 Tests in accordance with EN 3745-100

7.1.1 Optical fibre

Optical fibre performance requirements are given in Table 3.

Table 3 — Optical fibre performance requirements

Test method - part of the EN 3745 series	Designation of the test	Test conditions and results
EN 3745-201	Visual examination	Pass
EN 3745-202	Fibre dimensions, core	Method A: Core diameter = $(50 \pm 3) \mu\text{m}$
EN 3745-501	Optical fibre proof test	> 1 %
EN 3745-202	Fibre dimensions, cladding	Cladding diameter: $(125 \pm 2) \mu\text{m}$ Method A or B Sample should be in accordance with test methods Number of samples: 1
EN 3745-203	Primary coating outside diameter	Not applicable
EN 3745-202	Fibre dimensions, core non-circularity	Core non circularity: $\leq 5 \%$ ($3 \mu\text{m}$) Number of samples: 1
EN 3745-202	Fibre dimensions, cladding non-circularity	Cladding non-circularity: $\leq 2 \%$ ($2,5 \mu\text{m}$) Number of samples: 1
EN 3745-202	Fibre dimensions, concentricity error	Concentricity error: $\leq 3 \mu\text{m}$ Number of samples: 1