



**SLOVENSKI STANDARD**  
**kSIST FprEN 4641-100:2014**

**01-maj-2014**

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**Aeronavtika - Kabli, optični, zunanji premer obloge 125  $\mu\text{m}$  - 100. del: Kompaktna struktura 62,5/125  $\mu\text{m}$ , zunanji premer vlakna 1,8 mm - Standard za proizvod**

Aerospace series - Cables, optical 125  $\mu\text{m}$  diameter cladding - Part 100: Tight structure 62,5/125  $\mu\text{m}$  core GI fibre 1,8 mm outside diameter - Product standard

Luft- und Raumfahrt - Lichtwellenleiterkabel, Manteldurchmesser 125  $\mu\text{m}$  - Teil 100: Festadernaufbau GI 62,5/125  $\mu\text{m}$  Faser Kabeldurchmesser 1,8 mm - Produktnorm

Série aérospatiale - Câble, optique, diamètre extérieur de la gaine optique 125  $\mu\text{m}$  - Partie 100: Câble à structure serrée fibre à gradient d'indice cœur 62,5/125  $\mu\text{m}$ , diamètre extérieur 1,8 mm - Norme de produit

**Ta slovenski standard je istoveten z: FprEN 4641-100**

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**ICS:**

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

**kSIST FprEN 4641-100:2014**

**en,fr,de**



EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**FINAL DRAFT**  
**FprEN 4641-100**

March 2014

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ICS

English Version

**Aerospace series - Cables, optical 125  $\mu\text{m}$  diameter cladding -  
Part 100: Tight structure 62,5/125  $\mu\text{m}$  core GI fibre 1,8 mm  
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This draft European Standard is submitted to CEN members for formal vote. 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: Avenue Marnix 17, B-1000 Brussels**

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## Foreword

This document (FprEN 4641-100:2014) 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 document is currently submitted to the Formal Vote.

**FprEN 4641-100:2014 (E)****1 Scope**

This European Standard specifies the general characteristics, conditions for qualification, acceptance and quality assurance for fibre optic cable: 4641-100.

**2 Normative references**

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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*

EN 3475-511, *Aerospace series — Cables, electrical, aircraft use — Test methods — Part 511: Cable-to-cable abrasion*

EN 3745-100 (all parts), *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*

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

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

TR 6058, *Aerospace series — Cable code identification list* <sup>1)</sup>

ISO 1817, *Rubber, vulcanized — Determination of the effect of liquids* <sup>2)</sup>

TIA/EIA-455-30-B, *FOTP-30 Frequency Domain Measurement of Multimode* <sup>3)</sup>

TIA/EIA-455-175-B, *FOTP175 — Chromatic Dispersion Measurement of Single-mode Optical Fibers by the Differential Phase Shift Method* <sup>3)</sup>

ANSI/EIA 4920000-A, *Generic Specification for Optical Waveguide Fibers* <sup>3)</sup>

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1) Published as ASD-STAN Technical Report at the date of publication of this standard. <http://www.asd-stan.org/>

2) Published by: International International Standardisation Organisation. <http://www.iso.ch/>

3) Published by: National (US) American National Standard Institute. <http://www.ansi.org/>

### 3 Terms and definitions

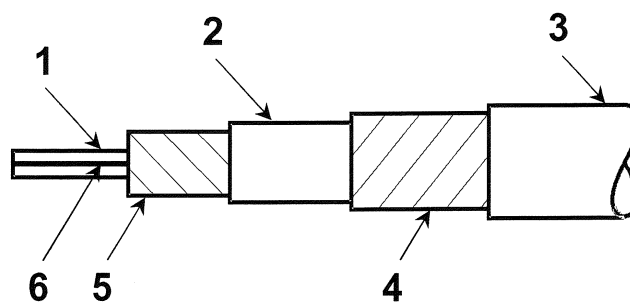
For the purposes of this document, the terms and definitions given in EN 3745-100 apply.

### 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.



#### Key

- 1 Optical cladding
- 2 Primary jacket
- 3 Outer jacket
- 4 Mechanical strength braid
- 5 Primary coating
- 6 Core

Figure 1

Table 1

| Property                    | Value   |
|-----------------------------|---|
| Mass                        | ≤ 4 g/m   |
| Operating temperature       | – 55 °C to 125 °C   |
| Minimum bend radius (20 °C) | Installation: 20 mm (10 × outside diameter)<br>Long term: 20 mm (10 × outside diameter)<br>Storage: 40 mm (20 × cable outside diameter) |
| Tensile strength            | > 200 N   |

### 6 Materials

See Table 2.

Table 2

| Element                           |          | Material                                |
|-----------------------------------|----------|---|
| Fibre                             | Core     | Silica                                  |
|                                   | Cladding |   |
| Primary coating                   |          | Silicone                                |
| Primary jacket                    |          | Halogen free high temperature copolymer |
| Mechanical strength reinforcement |          | Polymer aromatic braid                  |
| Outer jacket                      |          | High temperature copolymer              |

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

### 7.1 Optical fibre tests

See Table 3.

Table 3 — Optical fibre test methods

| Test method<br>EN 3745- | Designation of the test                  | Test conditions and results  |
|-------------------------|--|--|
| 201                     | Fibre visual examination                 | The coating shall be continuous and free of visible defects such as lumps, abrasions, cracks, splits or blisters.  |
| 202                     | Fibre core dimensions                    | Core diameter: $(62,5 \pm 3) \mu\text{m}$  |
| 202                     | Fibre dimension cladding diameter        | Cladding diameter: $(125 \pm 2) \mu\text{m}$<br>Method A or B<br>Sample should be in accordance with test methods<br>Number of sample: 1   |
| 202                     | Fibre dimension core non circularity     | Core non circularity: $\leq 5\%$ ( $3 \mu\text{m}$ )<br>Number of sample: 1  |
| 202                     | Fibre dimension cladding non circularity | Cladding non circularity: $\leq 2\%$ ( $2,5 \mu\text{m}$ )<br>Number of sample: 1  |
| 202                     | Fibre dimension concentricity error      | Concentricity error: $\leq 3 \mu\text{m}$<br>Number of sample: 1   |
| 301<br>Method A         | Fibre attenuation                        | $\leq 4 \text{ dB/km}$ at 850 nm (20 °C)<br>$\leq 2 \text{ dB/km}$ at 1300 nm (20 °C)  |
| 302                     | Numerical aperture                       | $0,275 \pm 0,015$  |
| 303                     | Bandwidth                                | Bandwidth $\geq 160 \text{ Mhz.km}$ at 850 nm<br>Bandwidth $\geq 500 \text{ Mhz.km}$ at 1 300 nm<br>Number of sample: 1<br>Minimal length of the sample: 1 km<br>Central wavelengths: 850 nm /1 300 nm $\pm 10 \text{ nm}$<br>Spectral width ( $-3 \text{ dB}$ ): $\leq 10 \text{ nm}$ for 850 nm and 1 300 nm |
| 501                     | Optical fibre proof test                 | $> 1\%$  |