IEC 61755-3-10

Edition 1.0 2016-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fibre optic interconnecting devices and passive components – Connector optical interfaces –
Part 3-10: Connector parameters of non-dispersion shifted single mode physically contacting fibres – Non-angled, ferrule-less, bore alignment connectors

DIspositifs d'interconnexion et composants passifs a fibres optiques – Interfaces optiques de connecteurs –
Partie 3-10: Paramètres de connecteurs pour fibres unimodales à dispersion non décalée, en contact physique – Connecteurs à alignement par alésage sans férule, sans angle

IEC 61755-3-10:2016-12(en-fr)

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International Standard IEC 61755-3-10 has been prepared by sub-committee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This bilingual version (2017-12) corresponds to the monolingual English version, published in 2016-12.

The text of this standard is based on the following documents:

CDV	Report on voting
86B/3990A/CDV	86B/4032/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

The French version of this standard has not been voted upon.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 61755 series, published under the general title *Fibre optic interconnecting devices and passive components – Connector optical interfaces*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – CONNECTOR OPTICAL INTERFACES –

Part 3-10: Connector parameters of non-dispersion shifted single mode physically contacting fibres – Non-angled, ferrule-less, bore alignment connectors

1 Scope

This part of IEC 61755 defines certain dimensional limits of a 125 μm diameter single mode silica fibre optical interface and an alignment bore to meet specific requirements for non-angled fibre-to-fibre interconnection as defined in IEC 61755-2-1. The silica fibre materials specified in this document are suitable for use in categories C, U, E and O as defined in IEC 61753-1.

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.

IEC 61753-1, *Fibre optic interconnecting devices and passive components – Part 1: General and guidance for performance standard*

IEC 61755-2-1:2006, *Fibre optic connector optical interfaces – Part 2-1: Optical interface standard single mode non-angled physically contacting fibres*

3 Terms and definitions

No terms and definitions are listed in this document.

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

- IEC Electropedia: available at http://www.electropedia.org/
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4 Description

The performance of a ferrule-less optical interface is determined by the accuracy with which the optical datum targets of two mating fibres are aligned with each other. There are three conditions affecting the alignment of two optical datum targets: lateral offset, angular offset and longitudinal offset.

Parameters influencing the lateral and angular offset of the optical fibre axes of this interface include the following:

- fibre cladding diameter;
- alignment bore diameter;

- length of the bore;
- fibre core location relative to the fibre cladding diameter centerline.

Parameters influencing the optical fibre end face deformation requirements to maintain the physical contact of two mated connectors to which this interface applies:

- end face spherical radius;
- end face angle;
- fibre tip diameter;
- axial force on fibre end face;
- fibre material physical constants.

5 Interface parameters

The end face dimensions of prepared fibres are shown in Figure 1. Alignment bore dimensions are shown in Figure 2. Optical interface parameter values for a 125 μm diameter optical fibre and an alignment bore are shown in Table 1.

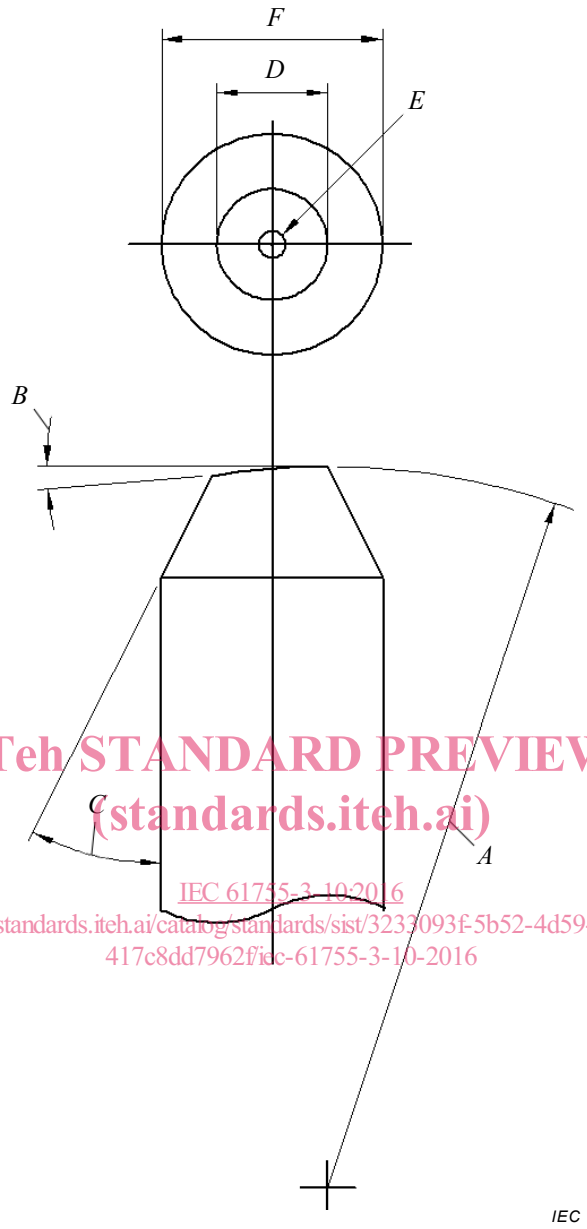

Figure 1 – Fibre end face dimensions

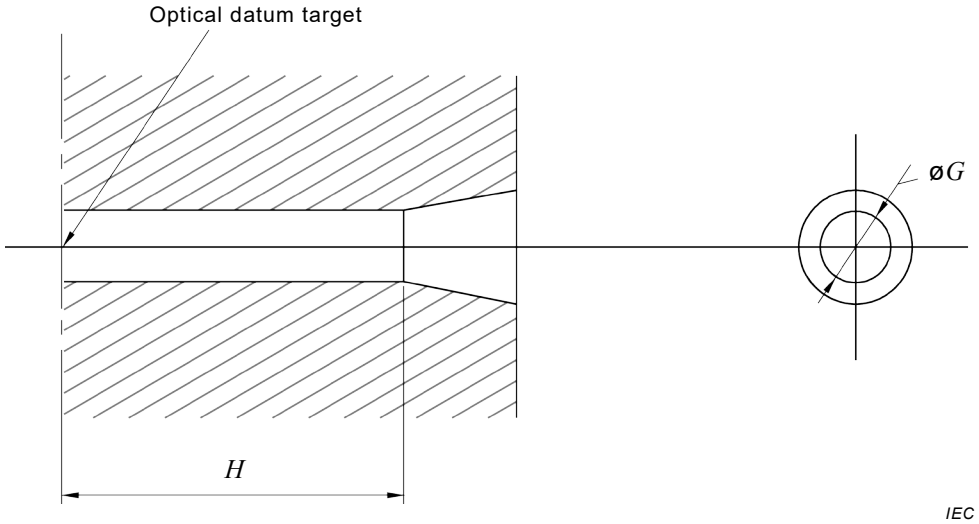

Figure 2 – Alignment bore dimensions

Table 1 – Optical interface parameter values for a 125 µm diameter optical fibre and an alignment bore

Ref.	Parameter values						Units	Remarks
	Grade B		Grade C		Grade D			
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum		
A					4	10	mm	End face radius
B					0	0,7	degrees	End face angle
C					25	65	degrees	Chamfer angle
D					0,03	0,08	mm	Tip diameter
E					0	0,000 6	mm	Core concentricity error
F					0,124 0 [a]	0,126 0 [a]	mm	Cladding diameter
G					0,126 0	0,127 0	mm	Bore diameter
H					0,55	-	mm	Bore length

NOTE 1 The core concentricity error and cladding diameter values specified in this document have been calculated to ensure that the attenuation values specified in IEC 61755-2-1:2006 are met at the wavelength, mode field diameter and nominal index of refraction given in IEC 61755-2-1:2006, Table 3, at the single channel level.

NOTE 2 Refer to Figure 1 and Figure 2 for dimensional references.

[a] IEC 60793-2-50:2015 defines a minimum cladding diameter of 0,124 mm and a maximum cladding diameter of 0,126 mm for categories of B1.1, B1.3, B6_a1 and B6_a2 fibre.

Contact force shall be 0,6 N minimum. The optical fibre material shall be fused silica, and the nominal material physical constant values shall be Young's modulus, (72,7 ± 7) GPa, Poisson's ratio, 0,165 ± 0,015.

Bibliography

IEC 60793-2-50:2015, *Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres*

IEC 61754 (all parts), *Fibre optic interconnecting devices and passive components – Fibre optic connector interfaces*

IEC 61755-1, *Fibre optic connector optical interfaces – Part 1: Optical interfaces for single mode non-dispersion shifted fibres – General and guidance*

ABE, Y., KOBAYASHI, M., ASAKAWA, S., and NAGASE, R. Analysis of Fiber Endface Shape and Processing Conditions for a Fiber Physical Contact Connector, IEICE Trans. Electron., vol. E86-C, no. 3, p.490-495, March 2003.