

**SLOVENSKI STANDARD**  
**SIST EN 61755-2-2:2007**

**01-september-2007**

**Optične priključne naprave za optične vodnike -- del 2-2: Standard optične priključne naprave za optične vodnike s fizičnim kontaktom na eni strani (IEC 61755-2-2:2006)**

Fibre optic connector optical interfaces -- Part 2-2: Optical interface standard single mode angled physically contacting fibres (IEC 61755-2-2:2006)

Optische Schnittstellen von Lichtwellenleiter-Steckverbindern - Teil 2-2: Optische Schnittstellen von abgelenkten Einmodenfasern mit physikalischem Kontakt (IEC 61755-2-2:2006)

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Interfaces optiques de connecteurs pour fibres optiques -- Partie 2-2: Interfaces optiques pour fibres unimodales en contact physique avec angle (IEC 61755-2-2:2006)

**Ta slovenski standard je istoveten z: EN 61755-2-2:2006**

**ICS:**

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**SIST EN 61755-2-2:2007**

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**Fibre optic connector optical interfaces**  
**Part 2-2: Optical interface standard single mode angled**  
**physically contacting fibres**  
(IEC 61755-2-2:2006)

Interfaces optiques de connecteurs  
pour fibres optiques  
Partie 2-2: Interfaces optiques  
pour fibres unimodales en contact  
physique avec angle  
(CEI 61755-2-2:2006)

Optische Schnittstellen von  
Lichtwellenleiter-Steckverbindern  
Teil 2-2: Optische Schnittstellen  
von abgeschrägten Einmodenfasern  
mit physikalischem Kontakt  
(IEC 61755-2-2:2006)

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# CENELEC

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

## Foreword

The text of document 86B/2317/FDIS, future edition 1 of IEC 61755-2-2, prepared by SC 86B, Fibre optic interconnecting devices and passive components, of IEC TC 86, Fibre optics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61755-2-2 on 2006-10-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2007-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2009-10-01

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## Endorsement notice

The text of the International Standard IEC 61755-2-2:2006 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 61755-2-1      NOTE Harmonized as EN 61755-2-1:2006 (not modified).

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2006-07

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**Interfaces optiques de connecteurs  
pour fibres optiques –**

**Partie 2-2:  
Interfaces optiques pour fibres unimodales  
en contact physique avec angle**

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**Fibre optic connector optical interfaces –**

**SIST EN 61755-2-2:2007**

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**Part 2-2:  
Optical interface standard single mode  
angled physically contacting fibres**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## FIBRE OPTIC CONNECTOR OPTICAL INTERFACES –

Part 2-2: Optical interface standard single mode  
angled physically contacting fibres

## FOREWORD

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International Standard IEC 61755-2-2 has been prepared by subcommittee 86B. Fibre optic interconnecting devices and passive components of IEC technical committee 86: Fibre optics.

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

| FDIS          | Report on voting |
|---------------|------------------|
| 86B/2317/FDIS | 86B/2372/RVD     |

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

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

A list of all parts of the IEC 61755 series, under the general title *Fibre optic connector optical interfaces*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

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## FIBRE OPTIC CONNECTOR OPTICAL INTERFACES –

### Part 2-2: Optical interface standard single mode angled physically contacting fibres

#### 1 Scope

The document defines a set of prescribed conditions that must be maintained in order to satisfy the requirements of attenuation and return loss performance in a randomly mated pair of fibres. Performance grades are classified into four categories for attenuation and one for return loss measurements.

#### 2 Performance grades

Proposed performance grades for APC polished contacting fibres are given in Tables 1 and 2. The performance grades based on return loss are for angled contacting fibres only. Performance grades for PC connectors are defined separately in IEC 61755-2-1.

**Table 1 – Single mode attenuation grades at 1 310 nm and 1 550 nm**

| Grade          | Attenuation<br>(max)<br>≥97 % | Attenuation<br>(mean) |
|----------------|-------------------------------|-----------------------|
| A <sup>a</sup> |                               |                       |
| B              | 0,25 dB                       | ≤0,12 dB              |
| C              | 0,50 dB                       | ≤0,25 dB              |
| D              | 1,0 dB                        | ≤0,50 dB              |

<sup>a</sup> Values not assigned.

**Table 2 – Single mode return loss grades at 1 310 nm and 1 550 nm for APC (8 degrees)**

| Grade | Return loss<br>dB<br>(mated) | Return loss<br>dB<br>(unmated) |
|-------|------------------------------|--------------------------------|
| 1     | ≥ 60                         | ≥ 55                           |

#### 3 Criteria for a fit within performance grades

The following figures and tables give the criteria for meeting the performance grades listed above. The parameters chosen for the criteria definition are based on the degree of significance in affecting the performance under test. The criteria selected are based on the theoretical model as well as experimental results.



### 3.1 Attenuation grades and criteria

#### 3.1.1 Design curves

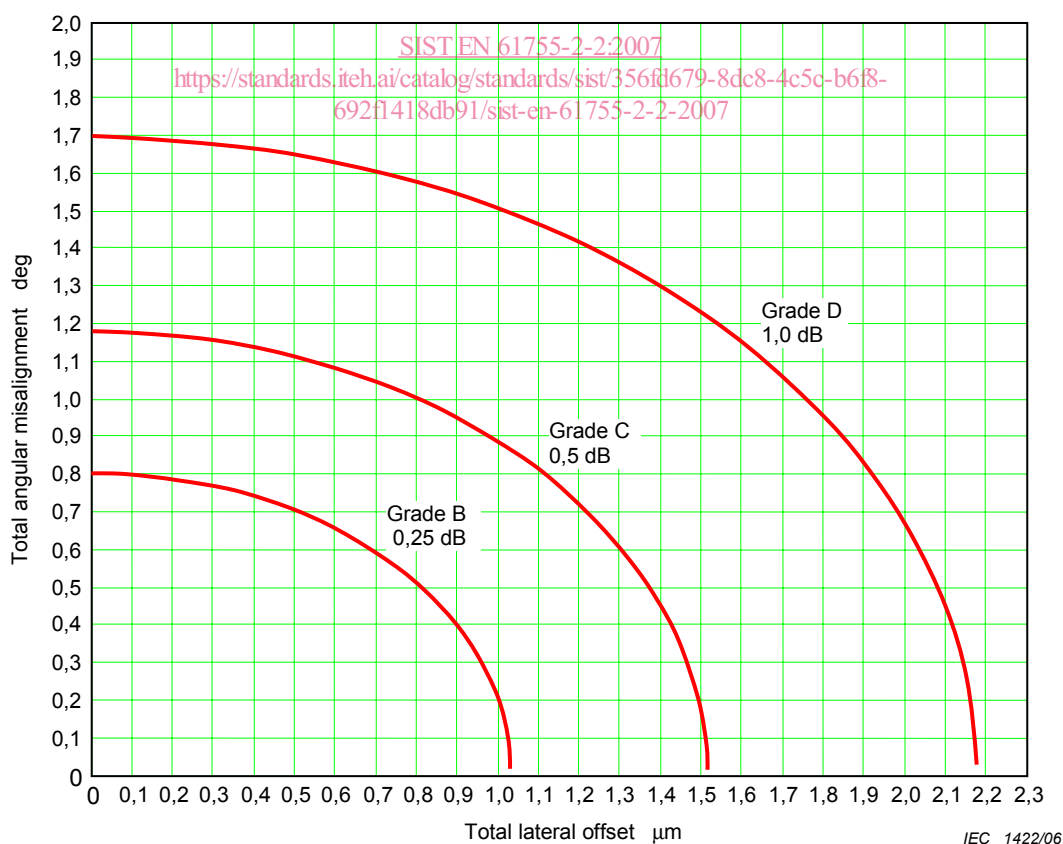
Considering a beam with a Gaussian distribution, the coupling efficiency,  $\eta$ , of two single mode fibres is given by Equation (1). The mode field diameters and the nominal index of refraction of the fibre core are given in Table 3.

**Table 3 – Mode field diameter and fibre core nominal index of refraction as a function of the wavelength of the light used**

| Fibre type                 | Wavelength<br>nm | MFD<br>$\mu\text{m}$ |      | $n_0$<br>(core) |
|----------------------------|------------------|----------------------|------|-----------------|
|                            |                  | Min.                 | Max. |                 |
| Dispersion Unshifted Fibre | 1 310            | 8,8                  | 9,6  | 1,452 0         |
|                            | 1 550            | 9,6                  | 11,2 | 1,449 3         |

The attenuation of the fibres is then given by  $\eta_{\text{combined}}$ . The design curves given in Figure 1 depict the allowed range of the lateral and angular misalignment. The design curves represent the determination of the parameters under a worst case mismatch of the mode field diameter of the selected fibres as given in Table 3, i.e. 8,8/9,6. These mode field diameter ranges are selected within the IEC family specification for single mode non-dispersion shifted fibres as given in Table 3. The equation is also applicable to 1 550 nm, using the parameters in Table 3, but the design curves are not shown in Figure 1.

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**Figure 1 – Maximum lateral offset and angular misalignment at  $\lambda = 1\,310\text{ nm}$**