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Fibre optic interconnecting devices and passive components - Fibre optic connector optical interfaces - Part 1: Enhanced macro bend loss multimode 50 core diameter fibres - General and guidance

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 08/23

Obsahuje: EN IEC 63267-1:2023, IEC 63267-1:2023

**137262**

EUROPEAN STANDARD

**EN IEC 63267-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2023

ICS 33.180.10

English Version

**Fibre optic interconnecting devices and passive components -  
Fibre optic connector optical interfaces - Part 1: Enhanced  
macro bend loss multimode 50 µm core diameter fibres -  
General and guidance  
(IEC 63267-1:2023)**

Dispositifs d'interconnexion et composants passifs  
fibroniques - Interfaces optiques de connecteurs fibroniques  
- Partie 1: Fibres multimodales de diamètre de coeur de 50  
µm à performances améliorées en matière de pertes par  
macrocourbures - Généralités et recommandations  
(IEC 63267-1:2023)

Lichtwellenleiter - Verbindungselemente und passive  
Bauteile - Optische Schnittstellen für Steckverbinder - Teil  
1: Verbessertes Makro-Biegeverlust bei Mehrmodenfasern  
mit 50 µm Kerndurchmesser - Allgemeines und Leitlinien  
(IEC 63267-1:2023)

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## EN IEC 63267-1:2023 (E)

### European foreword

The text of document 86B/4657/FDIS, future edition 1 of IEC 63267-1, 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 approved by CENELEC as EN IEC 63267-1:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2024-03-15
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-06-15

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### Endorsement notice

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In the official version, for Bibliography, the following notes have to be added for the standard indicated:

- IEC 60793-2-10 NOTE Approved as EN IEC 60793-2-10
- IEC 61280-4-1 NOTE Approved as EN IEC 61280-4-1
- IEC 61300-1:2022 NOTE Approved as EN IEC 61300-1:2022 (not modified)
- IEC 61300-2 (series) NOTE Approved as EN 61300-2 (series)
- IEC 61300-3 (series) NOTE Approved as EN 61300-3 (series)
- IEC 61753 (series) NOTE Approved as EN 61753 (series)
- IEC 61753-1 NOTE Approved as EN IEC 61753-1
- IEC 61754 (series) NOTE Approved as EN 61754 (series)
- IEC 61755-1:2005 NOTE Approved as EN 61755-1:2006 (not modified)

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cencenelec.eu](http://www.cencenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61280-1-4	-	Fibre optic communication subsystem test procedures - Part 1-4: General communication subsystems - Light source encircled flux measurement method	EN IEC 61280-1-4	-
IEC 61300	series	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures	EN IEC 61300	series
IEC 61300-3-6	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-6: Examinations and measurements - Return loss	EN 61300-3-6	-
IEC 61300-3-34	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-34: Examinations and measurements - Attenuation of random mated connectors	EN 61300-3-34	-
IEC 61300-3-45	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-45: Examinations and measurements - Attenuation of random mated multi-fibre connectors	EN 61300-3-45	-
IEC 63267	series	Fibre optic interconnecting devices and passive components - Fibre optic connector optical interfaces	EN IEC 63267	series



IEC 63267-1

Edition 1.0 2023-05

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Fibre optic interconnecting devices and passive components – fibre optic connector optical interfaces –  
Part 1: Enhanced macro bend loss multimode 50  $\mu\text{m}$  core diameter fibres –  
General and guidance**

**Dispositifs d'interconnexion et composants passifs fibroniques – Interfaces optiques de connecteurs fibroniques –  
Partie 1: Fibres multimodales de diamètre de cœur de 50  $\mu\text{m}$  à performances améliorées en matière de pertes par macrocourbures – Généralités et recommandations**





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Edition 1.0 2023-05

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General and guidance**

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Partie 1: Fibres multimodales de diamètre de cœur de 50  $\mu\text{m}$  à performances améliorées en matière de pertes par macrocourbures – Généralités et recommandations**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – FIBRE OPTIC CONNECTOR OPTICAL INTERFACES –****Part 1: Enhanced macro bend loss multimode 50 µm core diameter fibres – General and guidance**

## FOREWORD

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IEC 63267-1 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
86B/4657/FDIS	86B/4676/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

A list of all parts of the IEC 63267 series, under the general title *Fibre optic interconnecting devices and passive components – Fibre optic 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 [webstore.iec.ch](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.

## INTRODUCTION

### 0.1 Overview

A connector optical interface standard is a multi-part collection of the geometric, dimensional and material requirements necessary in order to comply with the optical functionality specifications for a defined interface between two optical fibres. It consists of those essential features that are functionally critical to the optical attenuation and return loss performance of an optical interface in the mated condition.

The IEC 63267 series is composed of optical interface standards for multimode connectivity which provide general information on optical connector interfaces for IEC 60793-2-10, subcategory A1-OM2b to A1-OM5b multimode fibre, at 850 nm band only.

The IEC 63267 series defines the location of the fibre core in relation to the datum target and the following key parameters: lateral and angular misalignment, core diameter, numerical aperture, end face separation, end face high index layer condition. It also defines standardized test methods where appropriate.

The subsequent parts of the multimode series contain those optical interfaces that have been standardized for international use. Each interface contains the essential information to ensure that products conforming to the standard will work together repeatedly to a known level of optical performance without the need for compatibility testing or cross checking.

It is important to emphasize that standard optical interfaces are intended to be used with IEC standards of various categories, which already include

- mechanical connector interface standards,
- test and measurement methods,
- performance standards, and
- reliability technical reports.

Interface standards, according to the IEC 61754 series, provide all the essential information about a given product type or family necessary to ensure that all products compliant with the interface standard will mate/de-mate.

Test and measurement methods, according to the IEC 61300-2 series and the IEC 61300-3 series, give a prescribed approach to the way in which key parameters that need to be assessed are evaluated.

Performance standards, according to the IEC 61753 series, use these test and measurement methods to define a set of conditions indicative to a known system location against which a product can be evaluated on a "once off" basis to prove that its design and manufacture are capable of satisfying the necessary criteria.

Reliability technical reports are intended to provide the user and manufacturer with a set of guidelines for assessing the ability of the product to continue to meet the required criteria over time.


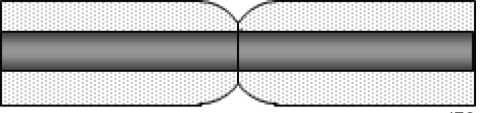
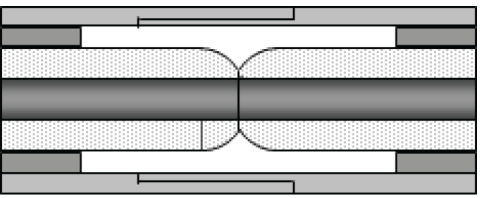
The two basic optical transmission performance parameters that characterize the optical interface are attenuation and return loss. Each parameter places different physical constraints on the optical interface. Environmental conditions also affect the performance of the optical interface and it may require definition of physical and mechanical requirements to ensure that the performance specified is maintained over the environmental extremes defined in a particular performance standard.

Manufacturing materials and processes also affect the optical interface and, therefore, this document has been designed to allow manufacturers to demonstrate compliance with this document while still permitting the maximum of manufacturing differentiation. The relationship between, and suitability of, materials specified in the IEC 63267-3 series standards for different performance categories as specified in IEC 61753-1 will be defined, for example zirconia ferrule material can be applied in all environmental categories, while the thermoset polymer material specified for some rectangular ferrules may only be applicable for category C.

Optical interface standards define sets of prescribed conditions, which should be maintained in order to satisfy the requirements for the attenuation and return loss performance in a randomly mated pair of fibres of the same type.

## 0.2 Hierarchical relationship

The hierarchical relationship between optical interface standards and interface standards is shown in Figure 1.

	Optical interface: IEC 62367-1 – General and guidance
 IEC	Optical interface: IEC 62367-2 – Fibre to fibre, optical connection performance requirements, e.g. lateral and angular misalignment, mode field diameter mismatch excluding fibre support mechanisms
 IEC	Optical interface: IEC 62367-3 – Fibre support mechanisms, optical connector end face and material deformation properties e.g. in the case of ferrules, effects of dome offset, fibre undercut and fibre position necessary to meet the performance requirements of IEC 62367-2
 IEC	Connector mechanical interface – IEC 61754 (all parts) Connector mating dimensions, e.g. effects of spring force, etc.

IEC 2531/05

**Figure 1 – Relationship between optical interface standards and interface standards**

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

## Part 1: Enhanced macro bend loss multimode 50 $\mu\text{m}$ core diameter fibres – General and guidance

### 1 Scope

This part of IEC 63267 covers enhanced macrobend loss 50  $\mu\text{m}$  core diameter multimode fibre optic connection interfaces. It includes references, document structure details, definitions, and standardised optical connection grades. The grades are based on random mated connections between two optical connector populations according to prescribed characteristics including the core diameter and numerical aperture mismatches.

This document describes the rules under which an optical interface is created. It also defines standardised test methods where appropriate.

### 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 61280-1-4, *Fibre optic communication subsystem test procedures – Part 1-4: General communication subsystems – Light source encircled flux measurement method*

IEC 61300 (all parts), *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures*

IEC 61300-3-6, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-6: Examinations and measurements – Return loss*

IEC 61300-3-34, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-34: Examinations and measurements – Attenuation of random mated connectors*

IEC 61300-3-45, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-45: Examinations and measurements – Attenuation of random mated connectors multi-fibre connectors*

IEC 63267 (all parts), *Fibre optic interconnecting devices and passive components – Fibre optic connector multimode optical interfaces*

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