# SLOVENSKI STANDARD
# oSIST prEN 50377-15-1:2020

**01-junij-2020**

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**Konektorski sestavi in povezovalne komponente za uporabo v optičnih komunikacijskih sistemih - Specifikacije izdelka - 15-1. del: Tip MPO s tulkami PPS, zaključenimi na večrodovnem vlaknu kategorije A1a po IEC 60793-2 za večrodovno vlakno velikosti 50/125 mikrometrov - samo za izboljšana makro upogljiva vlakna**

Connector sets and interconnect components to be used in optical fibre communication systems - Product specifications Part 15-1: Type MPO with 12 fibre PPS ferrules terminated on EN 60793-2 category A1a multimode fibre for 50/125 micron multimode fibre - macrobend enhanced fibre only



Jeux de connecteurs et composants d'interconnexion à utiliser dans les systèmes de communication par fibres optiques - Spécifications de produit - Partie 15-1: Type MPO équipé de férules PPS 12 fibres, raccordé sur fibres multimodales de catégorie A1a de l'EN 60793-2 pour fibres multimodales de 50/125 microns (fibres renforcées contre les macrocourbures uniquement)

**Ta slovenski standard je istoveten z:** **prEN 50377-15-1**

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**ICS:**

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|---|---|---|
| 33.180.20 | Povezovalne naprave za optična vlakna | Fibre optic interconnecting devices |

**oSIST prEN 50377-15-1:2020** **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

**DRAFT**
**prEN 50377-15-1**

March 2020

ICS

Will supersede EN 50377-15-1:2011 and all of its amendments and corrigenda (if any)

English Version

# Connector sets and interconnect components to be used in optical fibre communication systems - Product specifications Part 15-1: Type MPO with 12 fibre PPS ferrules terminated on EN 60793-2 category A1a multimode fibre for 50/125 micron multimode fibre - macrobend enhanced fibre only

Jeux de connecteurs et composants d'interconnexion à utiliser dans les systèmes de communication par fibres optiques - Spécifications de produit - Partie 15-1: Type MPO équipé de férules PPS 12 fibres, raccordé sur fibres multimodales de catégorie A1a de l'EN 60793-2 pour fibres multimodales de 50/125 microns (fibres renforcées contre les macrocourbures uniquement)

To be completed



This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2020-06-12.



It has been drawn up by CLC/TC 86BXA.

If this draft becomes a European Standard, CENELEC 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 CENELEC in three official versions (English, French, German).
A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

# Contents

# European foreword

This document (prEN 50377-15-1:2020) has been prepared by CLC/TC 86BXA “Fibre optic interconnect, passive and connectorised components “.

This document is currently submitted to the Enquiry.

The following dates are proposed:

| | | |
|---|---|---|
| • latest date by which the existence of this document has to be announced at national level | (doa) | dor + 6 months |
| • latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | dor + 12 months |
| • latest date by which the national standards conflicting with this document have to be withdrawn | (dow) | dor + 12 months (to be confirmed or modified when voting) |

This document will supersede EN 50377-15-1:2011 and all of its amendments and corrigenda (if any).

56 # Introduction

| CONNECTOR SETS AND INTERCONNECT COMPONENTS TO BE USED IN OPTICAL FIBRE COMMUNICATION SYSTEMS – PRODUCT SPECIFICATIONS | | | |
|---|---|---|---|
| **Part 15–1: Type MPO with 12 fibre PPS ferrules terminated on EN 60793-2 category A1-OM3b, A1-OM4b, A1-OM5b 50/125 micron macrobend enhanced multimode fibre** | | | |
| **Description** | | **Performance** | |
| Coupling mechanism: | push-pull | Application: | Indoor applications (test severities according IEC category C) |
| Configuration: | plug/adaptor/plug | Attenuation grade: (random mated) | $B_m$ 97 % < 0,60 dB<br>Mean ≤ 0,30 dB |
| Fibre category: | EN 60793-2, type A1-OM3b, A1-OM4b, A1-OM5b – macrobend enhanced fibre only | | |
| Cable type: | see Table 2 | Return loss grade: | R: ≥ 20 dB |

**Related documents:**

EN 50173 series, *Information technology – Generic cabling systems*

EN 60793-2, *Optical fibres – Part 2: Product specifications – General (IEC 60793-2)*

EN 60794-2, *Optical fibre cables – Part 2: Indoor cables – Sectional specification (IEC 60794-2)*

EN 60794-2-30, *Optical fibre cables – Part 2-30: Indoor cables – Family specification for optical fibre ribbon cables (IEC 60794-2-30)*

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

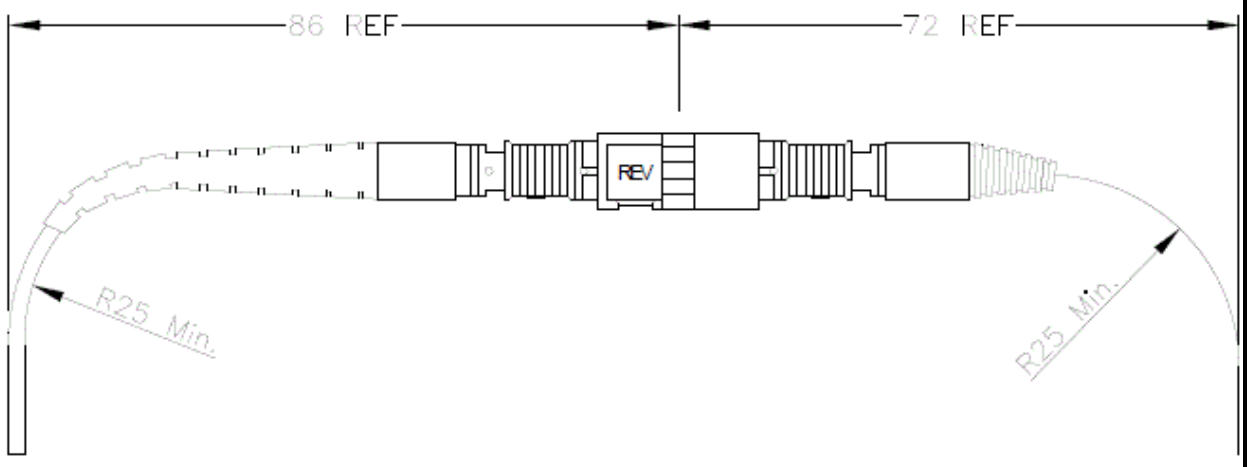
EN IEC 61753-1, *Fibre optic interconnecting devices and passive components performance standard – Part 1: General and guidance for performance standards (IEC 61753-1)*

EN 61754-7, *Fibre optic interconnecting devices and passive components – Fibre optic connector interfaces – Part 7: Type MPO connector family (IEC 61754-7)*

ISO/IEC 11801 Ed3 series, *Information technology – Generic cabling for customer premises*



**Maximum outline dimensions:**



# 1 Scope

## 1.1 Product definition

This document contains the initial, start of life dimensional, optical, mechanical and environmental performance requirements which a terminated and assembled 12 fibre multimode MPO connector set (plug adapter plug) meet in order for it to be categorized as an EN standard product.

Since different variants are permitted, product marking details are given in 5.2.

## 1.2 Intermateability

All products conforming to the requirements of this document will intermate and give the specified level of random attenuation and random return loss performance. The intention is that this will be true irrespective of the manufacturing source(s) of the product.

## 1.3 Operating environment

The tests selected combined with the severity and duration are representative of a backplane/back panel indoor application derived from customer premises protected environment as defined in EN 50173 series and ISO/IEC 11801 series and specified as category C in EN IEC 61753-1.

## 1.4 Reliability

Whilst the anticipated service life expectancy of the product in this environment is 20 years, compliance with this document does not guarantee the reliability of the product. This is expected to be predicted using a recognized reliability assessment programme.



## 1.5 Quality assurance

Compliance with this document does not guarantee the manufacturing consistency of the product. This is expected to be maintained using a recognized quality assurance programme.



# 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 61300-1:2016, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 1: General and guidance (IEC 61300-1:2016)*

EN 61300-2-1, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-1: Tests - Vibration (sinusoidal) (IEC 61300-2-1)*

EN 61300-2-2, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-2: Tests - Mating durability (IEC 61300-2-2)*

EN 61300-2-4, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-4: Tests - Fibre/cable retention (IEC 61300-2-4)*

EN 61300-2-5, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-5: Tests - Torsion (IEC 61300-2-5)*

EN 61300-2-6, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-6: Tests - Tensile strength of coupling mechanism (IEC 61300-2-6)*

EN 61300-2-12, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-12: Tests – Impact (IEC 61300-2-12)*

EN 61300-2-17, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-17: Tests - Cold (IEC 61300-2-17)*

EN 61300-2-18, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-18: Tests - Dry heat - High temperature endurance (IEC 61300-2-18)*

EN 61300-2-19, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-19: Tests - Damp heat (steady state) ((IEC 61300-2-19)*

EN 61300-2-22, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-22: Tests - Change of temperature (IEC 61300-2-22)*

EN 61300-2-42, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-42: Tests - Static side load for strain relief (IEC 61300-2-42)*

EN 61300-2-44, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-44: Tests - Flexing of the strain relief of fibre optic devices (IEC 61300-2-44)*

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

EN 61300-3-28, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-28: Examinations and measurements - Transient loss (IEC 61300-3-28)*

EN 61300-3-30, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-30: Examinations and measurements - Polish angle and fibre position on single ferrule multifibre connectors (IEC 61300-3-30)*



EN 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 61300-3-34)*



## 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/
- ISO Online browsing platform: available at http://www.iso.org/obp

## 4 General

### 4.1 Description

The MPO connector is a single position plug connector set of plug adapter plug configuration characterized by a spring-loaded butting rectangular ferrule with twelve optical fibres and a push-pull coupling mechanism. The optical alignment mechanism of the connectors is of precision pin and hole type.

### 4.2 Plug

The plug features a rectangular thermo plastic composite ferrule and a push-pull coupling mechanism.

A cover (dust cap) to protect the ferrule end face when the connector is in the unmated condition shall be provided.

## 4.3 Adapter

The adapter has no role in the final alignment mechanism. The mounting style is

— rectangular flange - 2 holes.

Covers (dust caps) may be provided to protect each port of the adapter.

## 4.4 Materials

Materials which are not specified or which are not specifically described are left to the discretion of the manufacturer.

The material for the ferrule is Polyphenylene Sulphide (PPS) with a Young's modulus of 20 GPa nominal. The guide pins are made of stainless steel. Alternative materials, which have compatible material properties, may be used as long as end face and performance requirements are met under all conditions as specified in this document.

## 4.5 Dimensions

Outline dimensions and other dimensions necessary to ensure intermateability or which affect performance are specified. All other dimensions are left to the discretion of the manufacturer. Where the mating face limit dimensions are not in agreement with the IEC interface this is clearly stated.

## 4.6 Colour and marking

Marking of the product shall be in the following order of precedence:

a) identification of manufacturer;

b) manufacturing date code: year/week;

c) manufacturers part number;

d) variant identification number.



The colour scheme as shown in Table 1 is preferred:

**Table 1 — Preferred colour scheme**

| Adaptor | Plug |
|---|---|
| Black, Beige, Aqua | Black, Beige, Aqua |

# 5 Variants

## 5.1 Terminated plug

The following variants are permitted:

C01 and C02 variants are for A1-OM3b, A1-OM4b, A1-OM5b fibre (50 µm) reinforced cable and C03 variant is for A1-OM3b, A1-OM4b, A1-OM5b fibre (50 µm) fibre ribbon.

160 **Table 2 — Plug variants**

| Variant No | Fibre/Cable mm (Nominal) | Structure | Note |
|---|---|---|---|
| C01F | ø 3,0–3,5 | Reinforced cable | Without pins |
| C01M | ø 3,0–3,5 | Reinforced cable | With pins |
| C02F | ø 2,0–2.4 | Reinforced cable | Without pins |
| C02M | ø 2,0–2.4 | Reinforced cable | With pins |
| C03F | 1x3 | Bare ribbon | Without pins |
| C03M | 1x3 | Bare ribbon | With pins |

161 ## 5.2 Adapter

162 The following variant as shown in Table 3 is permitted:

163 **Table 3 — Adapter variants**

| Variant No. | Format |
|---|---|
| D01 | Rectangular flange 2 hole |

164 ## 5.3 Identification of variants



165 Tables 4 and 5 identify plug variants.

166 **Table 4 — Identification of plug variants**



| Variant No. | Performance grade (Attenuation/return loss) | Identification number |
|---|---|---|
| C01F | $B_MR$ | EN 50377-15-1-C01F-$B_MR$ |
| C01M | $B_MR$ | EN 50377-15-1-C01M-$B_MR$ |
| C02M | $B_MR$ | EN 50377-15-1-C02F-$B_MR$ |
| C02F | $B_MR$ | EN 50377-15-1-C02M-$B_MR$ |
| C03M | $B_MR$ | EN 50377-15-1-C03F-$B_MR$ |
| C03F | $B_MR$ | EN 50377-15-1-C03M-$B_MR$ |

167 **Table 5 — Identification of adapter variants**

| Variant No. | Performance grade (Attenuation/return loss) | Identification number |
|---|---|---|
| D01 | - | EN 50377-15-1-D01 |

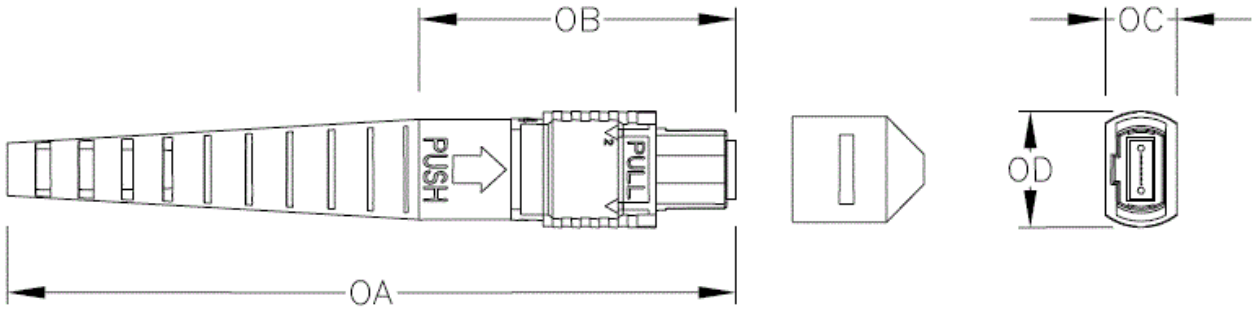
168 NOTE The adapter plays no role in the final alignment of this connector style.

# 6 Dimensional requirements

## 6.1 Outline dimensions

### 6.1.1 Plug variants

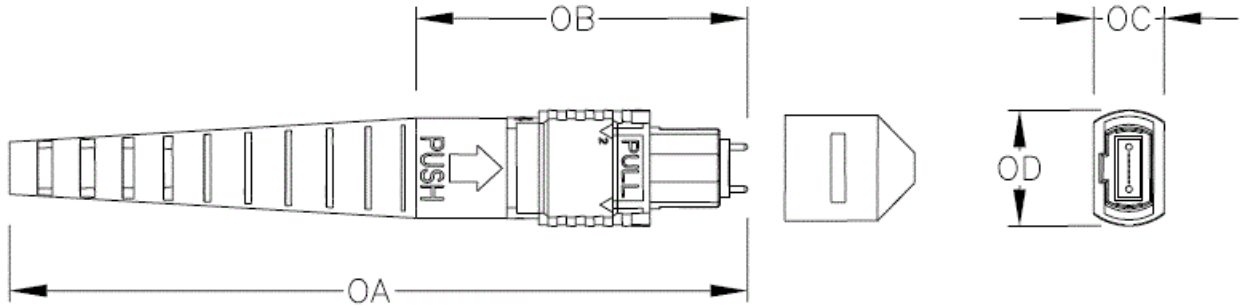
Figures 1 to 4 give the dimensions of plug variants.




| Ref. | Dimensions | | | Note |
|---|---|---|---|---|
| | min. | mm | max. | |
| OA | - | | 76,7 | |
| OB | - | | 36,6 | |
| OC | - | | 7,6 | |
| OD | - | | 12,6 | |



**Figure 1 — Outline dimensions – Plug C01F / C02F**




| Ref. | Dimensions | | | Note |
|---|---|---|---|---|
| | min. | mm | max. | |
| OA | - | | 78,7 | |
| OB | - | | 38,6 | |
| OC | - | | 7,6 | |
| OD | - | | 12,6 | |

**Figure 2 — Outline dimensions – Plug C01M / C02M**