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**Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-20: Examinations and measurements - Directivity of fibre optic branching devices (IEC 61300-3-20:2001) (Note: Includes corrigendum of March 2002)**

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures -- Part 3-20: Examinations and measurements - Directivity of fibre optic branching devices

**iTeh STANDARD PREVIEW**

Lichtwellenleiter - Verbindungselemente und passive Bauteile - Grundlegende Prüf- und Messverfahren -- Teil 3-20: Untersuchungen und Messungen - Richtdämpfung von LWL-Verzweigern

[SIST EN 61300-3-20:2002](https://standards.iteh.ai/catalog/standards/sist/240f049e-9f4d-49bf-85e5-962c10e0fb76/sist-en-61300-3-20-2002)

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Dispositifs d'interconnexion et composants passifs à fibres optiques - Méthodes fondamentales d'essais et de mesures -- Partie 3-20: Examens et mesures - Directivité des dispositifs de couplage de fibres optiques

**Ta slovenski standard je istoveten z: EN 61300-3-20:2001**

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EUROPEAN STANDARD

**EN 61300-3-20**

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2001

ICS 33.180.20

English version

**Fibre optic interconnecting devices and passive components -  
Basic test and measurement procedures  
Part 3-20: Examinations and measurements -  
Directivity of fibre optic branching devices  
(IEC 61300-3-20:2001)**

Dispositifs d'interconnexion et  
composants passifs à fibres optiques -  
Méthodes fondamentales d'essais  
et de mesures

Partie 3-20: Examens et mesures -  
Directivité des dispositifs de couplage de  
fibres optiques  
(CEI 61300-3-20:2001)

Lichtwellenleiter-Verbindungselemente  
und passive Bauteile -  
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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

EN 61300-3-20:2001

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### Foreword

The text of document 86B/1467/FDIS, future edition 1 of IEC 61300-3-20, 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 61300-3-20 on 2001-10-01.

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) 2002-07-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2004-10-01

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### Endorsement notice

The text of the International Standard IEC 61300-3-20:2001 was approved by CENELEC as a European Standard without any modification.

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**Dispositifs d'interconnexion et composants  
passifs à fibres optiques –  
Méthodes fondamentales d'essais et de mesures –**

**Partie 3-20:**

**Examens et mesures –  
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**Fibre optic interconnecting devices  
and passive components –  
Basic test and measurement procedures –**

**Part 3-20:**

**Examinations and measurements –  
Directivity of fibre optic branching devices**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC INTERCONNECTING DEVICES  
 AND PASSIVE COMPONENTS –  
 BASIC TEST AND MEASUREMENT PROCEDURES –**

**Part 3-20: Examinations and measurements –  
 Directivity of fibre optic branching devices**

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61300-3-20 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This bilingual version (2002-07) replaces the English version.

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

FDIS	Report on voting
86B/1467/FDIS	86B/1535/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 3.

The committee has decided that the contents of this publication will remain unchanged until 2008. At this date, the publication will be

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

# FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – BASIC TEST AND MEASUREMENT PROCEDURES –

## Part 3-20: Examinations and measurements – Directivity of fibre optic branching devices

### 1 Scope

The purpose of this part of IEC 61300 is to measure the directivity of light between channels of a multiport non-wavelength-selective MxN fibre optic branching device. The directivity is defined as the fraction of the light that goes from an input path to another input optical path, normally isolated from the previous one.

### 2 General description

The measurement procedure of the directivity entails a comparison between two optical power level measurements. The reference power level is the optical power measured from a fibre which is connected to an optical source. The directivity is the measured optical power at an input port that is normally optically isolated from the reference input when it is connected to the optical source. The directivity is then given by the ratio of these two power level measurements, expressed in decibels (dB).

Since directivity levels of concern for practical use of fibre optic branching devices can be very small, even of the order of 70 dB, the relevant measurement can be degraded by several factors. Therefore this procedure is designed to either circumvent these factors, or to point them out so that adequate care and choice of test apparatus can be taken. Factors which can degrade a measurement of directivity include:

- coupling of ambient light into measurement channels;
- reflection of light from the ends of fibre pigtailed;
- light carried in cladding modes;
- accuracy of the power meter at low light levels;
- fibre pigtail lengths since light can scatter (Rayleigh scattering) along the pigtailed.

### 3 Apparatus

The apparatus consists of:

#### 3.1 Optical source (S)

The source is pigtailed or connected to a launch optical fibre compatible with the input port of the branching device under test (BD). It is also designed/conditioned so that cladding modes are suppressed at the output. For measurements of BDs which are not inherently broad band in optical performance, the bandwidth of the light source shall fall within the BD operative wavelength range; in particular the emitted power of the source in the BD band shall be greater than the power source level outside the same band by at least 10 dB. Moreover the output power of the light source shall also be high enough to permit a dynamic range of at least 10 dB over the minimum directivity to be measured, with the power meter used.

### 3.2 Temporary joint (TJ)

This is a method, device, or mechanical fixture for temporarily aligning two fibre ends into a reproducible, low loss joint and polarisation independent splicing. Typically, a fusion splice is used after the polarisation adjuster since mechanical splices may exhibit some polarisation sensitivity if the end faces are not perpendicular to the fibre axis. The stability of the temporary joint shall be compatible with the required measurement precision.

### 3.3 Terminations (T)

These terminations are components or techniques to suppress reflected light from the BD output ports. Fibre terminations, marked T, shall have a high return loss. Three types of terminations are suggested:

- angled fibre ends;
- the application of an index matching material to the fibre end;
- attenuation of the fibre, for example with a mandrel wrap.

The fibre termination shall have a return loss such that the reflections generated from all the terminated ports give a total return loss at least 20 dB greater than the minimum directivity to be measured.

### 3.4 Detector (D)

This should be a high dynamic range power meter. It should have an operational wavelength range consistent with the BD and should also have the capability to "zero" the reference level.

## 4 Procedure

4.1 Connect the light source to the detector (D), as shown in figure 1(a), by means of a TJ where appropriate or by means of a connector in the case of a connectorized BD.

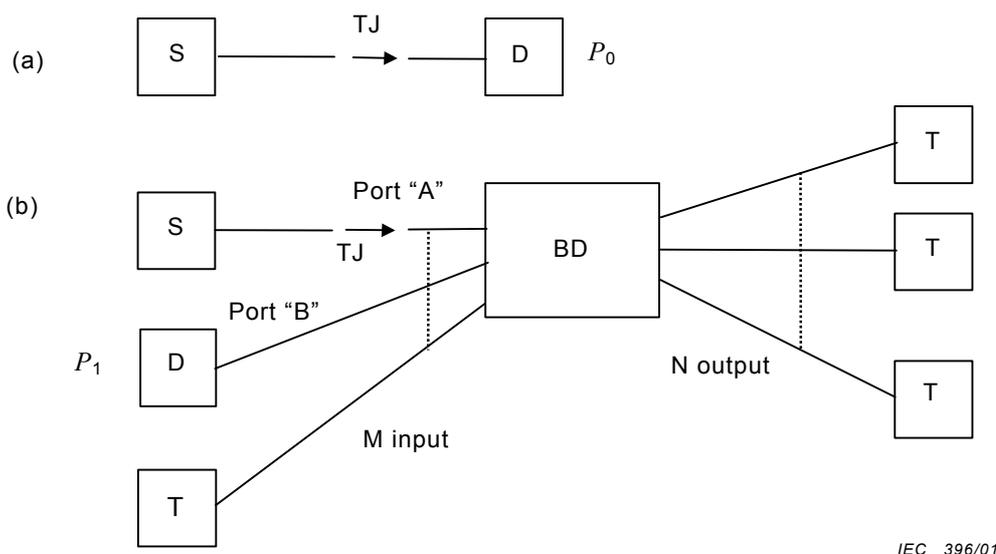


Figure 1 – Measurement of directivity