



SLOVENSKI STANDARD

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Optični spojni elementi in pasivne komponente - Optični elementi za WDM (valovni multipleks) - 1. del: Rodovna specifikacija (IEC 62074-1:2014)

Fibre optic interconnecting devices and passive components - Fibre optic WDM devices - Part 1: Generic specification

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ICS:

33.180.20	Povezovalne naprave za optična vlakna	Fibre optic interconnecting devices
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EUROPEAN STANDARD
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English version

**Fibre optic interconnecting devices and passive components -
Fibre optic WDM devices -
Part 1: Generic specification
(IEC 62074-1:2014)**

Dispositifs d'interconnexion et dispositifs
passifs à fibres optiques -
Dispositifs WDM à fibres optiques -
Partie 1: Spécification générique
(CEI 62074-1:2014)

Lichtwellenleiter -
Verbindungselemente und passive
Bauteile -
Lichtwellenleiter-WDM-Bauteile -
Teil 1: Fachgrundspezifikation
(IEC 62074-1:2014)

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

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Foreword

The text of document 86B/3700/FDIS, future edition 2 of IEC 62074-1, 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 62074-1:2014.

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) 2014-12-13
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-03-13

This document supersedes EN 62074-1:2009.

EN 62074-1:2014 includes the following significant technical changes with respect to EN 62074-1:2009:

- substantial updating to the definitions;
- the addition of informative Annexes C to G, giving examples of technical information concerning WDM devices.

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60027	series	Letter symbols to be used in electrical technology	EN 60027	series
IEC 60050-731	-	International Electrotechnical Vocabulary (IEV) Chapter 731: Optical fibre communication	-	-
IEC 60695-11-5	-	Fire hazard testing Part 11-5: Test flames - Needle flame test method - Apparatus, confirmatory test arrangement and guidance	EN 60695-11-5	-
IEC 60825-1	-	Safety of laser products Part 1: Equipment classification and requirements	EN 60825-1	-
IEC/TR 61931	-	Fibre optic - Terminology	-	-
ISO 129-1	-	Technical drawings - Indication of dimensions and tolerances Part 1: General principles	-	-
ISO 286-1	-	Geometrical product specifications (GPS) - ISO code system for tolerances on linear sizes Part 1: Basis of tolerances, deviations and fits	EN ISO 286-1	-
ISO 1101	-	Geometrical product specifications (GPS) - Geometrical tolerancing - Tolerances of form, orientation, location and run-out	EN ISO 1101	-
ISO 8601	-	Data elements and interchange formats - Information interchange - Representation of dates and times	-	-

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INTERNATIONAL STANDARD



**Fibre optic interconnecting devices and passive components – Fibre optic
WDM devices –
Part 1: Generic specification**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – FIBRE OPTIC WDM DEVICES –

Part 1: Generic specification

FOREWORD

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International Standard IEC 62074-1 has been prepared by subcommittee SC 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition, published in 2009, and constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) substantial updating to the definitions;
- b) the addition of informative Annexes C to G, giving examples of technical information concerning WDM devices.

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

FDIS	Report on voting
86B/3700/FDIS	86B/3722/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 in the IEC 62074 series, published under the general title *Fibre optic interconnecting devices and passive components – Fibre optic wdm devices*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability 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
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FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – FIBRE OPTIC WDM DEVICES –

Part 1: Generic specification

1 Scope

This part of IEC 62074 applies to fibre optic wavelength division multiplexing (WDM) devices. These have all of the following general features:

- they are passive, in that they contain no optoelectronic or other transducing elements; however they may use temperature control only to stabilize the device characteristics; they exclude any optical switching functions;
- they have three or more ports for the entry and/or exit of optical power, and share optical power among these ports in a predetermined fashion depending on the wavelength;
- the ports are optical fibres, or optical fibre connectors.

This standard establishes uniform requirements for the following:

- optical, mechanical and environmental properties.

2 Normative references (standards.iteh.ai)

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60027 (all parts), *Letter symbols to be used in electrical technology*

IEC 60050-731, *International Electrotechnical Vocabulary – Chapter 731: Optical fibre communication*

IEC 60695-11-5, *Fire hazard testing – Part 11-5: Test flames – Needle-flame test method – Apparatus, confirmatory test arrangement and guidance*

IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 61931, *Fibre optics – Terminology*

ISO 129-1, *Technical drawings – Indication of dimensions and tolerances – Part 1: General principles*

ISO 286-1, *Geometrical product specifications (GPS) – ISO coding system for tolerances of linear sizes – Part 1: Bases of tolerances and fits*

ISO 1101, *Geometrical product specifications (GPS) – Geometrical tolerancing – Tolerances of form, orientation, location and run-out*

ISO 8601, *Data elements and interchange formats – Information interchange – Representation of dates and times*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-731, as well as the following, apply.

3.1 Basic term definitions

3.1.1

port

optical fibre or optical fibre connector attached to a passive device for the entry and/or exit of the optical power

3.1.2

transfer matrix

optical properties of a fibre optic wavelength-selective branching device can be defined in terms of an $n \times n$ matrix of coefficients, where n is the number of ports, and the coefficients represent the fractional optical power transferred between designated ports

Note 1 to entry: A detailed explanation of the transfer matrix is shown in Annex A. The ports are numbered sequentially, so that the transfer matrix is developed to show all ports and all possible combinations. The port numbering is arbitrary.

Note 2 to entry: Figure 1 below shows an example of a six-port device, with two input ports and four output ports. This WDM device can operate as four input ports and two output ports for their reciprocity characteristics. Also, it shall be noted that a combination of input and output port number can be selected, for example, 1 input port and 5 output ports, 3 input ports and 3 output ports and so on, especially for bi-directional transmission system application. Refer to Annex B.

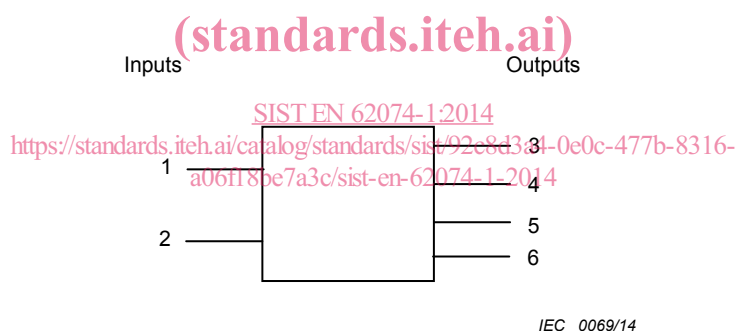


Figure 1 – Example of a six-port device, with two input and four output ports

Note 3 to entry: If there are four operating wavelengths, then the resulting transfer matrix becomes a $6 \times 6 \times 4$ matrix: Optical attenuation at λ_1 from port 1 to port 6 would use a_{161} . Return loss of port 2 at λ_4 would use a_{224} . Optical attenuation from port 5 to port 2 at λ_3 would use a_{523} .

3.1.3

transfer matrix coefficient

element t_{ij} of the transfer matrix

Note 1 to entry: t_{ij} is the number of more than or equal to zero, and less than or equal to one.

Note 2 to entry: A detailed explanation is shown in Annex A.

3.1.4

logarithmic transfer matrix

transfer matrix whose matrix element a_{ij} is a logarithmic value of transfer matrix element t_{ij} . a_{ij} is a number of positive and expressed in dB

Note 1 to entry: A detailed explanation is shown in Annex A.

3.1.5**conducting port pair**

port pair consisting of i and j where t_{ij} is nominally greater than zero (ideally t_{ij} is 1 and a_{ij} is 0) at a specified wavelength

3.1.6**isolated port pair**

pair i and j consisting where t_{ij} is nominally zero, and a_{ij} is nominally infinite at a specified wavelength

3.1.7**channel**

wavelength (frequency) band in which an optical signal is transmitted for a WDM device

Note 1 to entry: WDM devices have two or more channels.

3.1.8**channel spacing**

centre-to-centre differences in frequency or wavelength between adjacent channels in a WDM device

3.2 Component definitions**3.2.1****wavelength-selective branching device**

passive component with three or more ports that shares optical power among its ports in a predetermined fashion, without any amplification or other active modulation but only depending on the wavelength, in the sense that at least two different wavelength ranges are nominally transferred between two different pairs of ports

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3.2.2**wavelength division multiplexing device**

wavelength division multiplexer

WDM device

synonym for a wavelength-selective branching device

Note 1 to entry: The term of wavelength-selective device is the contrast with the term of non-wavelength-selective branching device. The term of WDM device is frequently used.

3.2.3**dense wavelength division multiplexing device**

DWDM device

WDM device which is intended to operate for a channel spacing equal or less than 1 000 GHz (approximately 8 nm at 1 550 nm and 5,7 nm at 1 310 nm)

3.2.4**coarse wavelength division multiplexing device**

CWDM device

WDM device which is intended to operate for channel spacing less than 50 nm and greater than 1 000 GHz

3.2.5**wide WDM device**

WWDM

WDM device which is intended to operate for channel spacing equal to or greater than 50 nm