

# INTERNATIONAL STANDARD



**Fibre optic interconnecting devices and passive components – Fibre optic  
passive chromatic dispersion compensators –  
Part 1: Generic specification**



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## CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references .....	6
3 Terms and definitions .....	7
3.1 Basic terms.....	7
3.2 Component terms .....	7
3.3 Performance parameter .....	8
4 Requirements.....	10
4.1 General.....	10
4.2 Classification.....	10
4.2.1 General .....	10
4.2.2 Type.....	10
4.2.3 Style.....	11
4.2.4 Variant.....	12
4.2.5 Normative reference extensions .....	12
4.3 Documentation.....	13
4.3.1 Symbols .....	13
4.3.2 Specification system.....	13
4.3.3 Drawings .....	14
4.3.4 Tests and measurements.....	15
4.3.5 Test data sheets.....	15
4.3.6 Instructions for use .....	15
4.4 Standardization system.....	15
4.4.1 Performance standards.....	15
4.4.2 Reliability standards .....	16
4.4.3 Interlinking.....	16
4.5 Design and construction.....	18
4.5.1 Materials .....	18
4.5.2 Workmanship.....	18
4.6 Performance .....	18
4.7 Identification and marking .....	18
4.7.1 General .....	18
4.7.2 Variant identification number .....	18
4.7.3 Component marking.....	19
4.7.4 Package marking .....	19
4.8 Packaging.....	19
4.9 Storage conditions .....	20
4.10 Safety.....	20
Annex A (informative) Example of dispersion compensating fibre (DCF) technologies.....	21
Annex B (informative) Example of fibre Bragg grating (FBG) technologies .....	23
Annex C (informative) Example of virtually imaged phased array (VIPA) technologies .....	25
Annex D (informative) Example of GT etalon technologies .....	27
Annex E (informative) Technology dependent characteristics of PCDCs .....	28
Bibliography.....	29

Figure 1 – Standards currently under preparation .....	17
Figure A.1 – Chromatic dispersion in a standard single-mode optical fibre (SMF) .....	21
Figure A.2 – Calculated contour for different dispersion at the wavelength of 1,55 $\mu\text{m}$ ( $\text{CD}(\lambda:1,55 \mu\text{m})$ ) for a step index core fibre .....	22
Figure A.3 – Examples of refractive index profile used in DCF .....	22
Figure B.1 – Illustration of the use of a chirped fibre Bragg grating for chromatic dispersion compensation .....	23
Figure B.2 – Expanded view over 10 nm of the insertion loss spectrum of a multi- channel FBG .....	24
Figure C.1 – Structure of virtually imaged phased array (VIPA) .....	25
Figure C.2 – Detailed light path and mechanism of generating chromatic dispersion .....	26
Figure D.1 – Gires-Tournois etalon .....	27
Table 1 – Types of passive chromatic dispersion compensators .....	11
Table 2 – Three-level IEC specification structure .....	13
Table 3 – Standards interlink matrix .....	17
Table 4 – Quality assurance options .....	18
Table E.1 – Summary of technology dependent characteristics of PCDCs .....	28

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC INTERCONNECTING DEVICES  
AND PASSIVE COMPONENTS – FIBRE OPTIC PASSIVE  
CHROMATIC DISPERSION COMPENSATORS –****Part 1: Generic specification****FOREWORD**

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International Standard IEC 61978-1 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

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

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

- a) introduction of new terms and definitions;
- b) revision of classifications;
- c) addition of Annex E.

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

CDV	Report on voting
86B/3639/CDV	86B/3710/RVC

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 61978 series, published under the general title *Fibre optic interconnecting devices and passive components – Fibre optic passive chromatic dispersion compensators*, 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

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# **FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – FIBRE OPTIC PASSIVE CHROMATIC DISPERSION COMPENSATORS –**

## **Part 1: Generic specification**

### **1 Scope**

This part of IEC 61978 applies to fibre optic passive chromatic dispersion compensators, all exhibiting the following features:

- they are optically passive;
- they have an optical input and an optical output for transmitting optical power;
- the ports are optical fibres or optical fibre connectors;
- they are wavelength sensitive;
- they may be polarization sensitive.

This standard establishes uniform requirements for the passive chromatic dispersion compensator.

### **2 Normative references**

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 60617 (all parts), *Graphical symbols for diagrams*

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

IEC 60793-2-50:2012, *Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres*

IEC 60825 (all parts), *Safety of laser products*

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

IEC 61300-3-38, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-38: Examinations and measurements – Group delay, chromatic dispersion and phase ripple*

IEC TR 61930, *Fibre optic graphical symbology*



IEC Guide 102, *Electronic components – Specification structures for quality assessment (Qualification approval and capability approval)*

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 definitions apply.

#### 3.1 Basic terms

##### 3.1.1

##### **port**

optical fibre or optical fibre connector attached to a passive component for the entry and/or exit of optical power (input and/or output port)

#### 3.2 Component terms

##### 3.2.1

##### **passive chromatic dispersion compensator**

PCDC

two-port in-line passive device used to perform chromatic dispersion compensation

Note 1 to entry: PCDCs are commonly used to compensate the chromatic dispersion of an optical path by adding the opposite sign chromatic dispersion.

Note 2 to entry: The typical optical paths comprise single-mode fibre, dispersion shifted fibre and/or non-zero dispersion shifted fibre. PCDCs have either negative or positive chromatic dispersion values depending on the chromatic dispersion sign of the optical path.

##### 3.2.2

##### **dispersion compensating fibre**

DCF

speciality fibre to compensate for the chromatic dispersion of an optical path

##### 3.2.3

##### **passive DCF based dispersion compensator**

PCDC which constitutes DCF; realised by having chromatic dispersion characteristics of opposite sign to that of the optical path which are controlled the refractive index profile of the fibre

##### 3.2.4

##### **fibre Bragg grating**

FBG

fibre type optical device which has modulated refractive index profile in the core