



SLOVENSKI STANDARD SIST EN 61978-1:2010

01-maj-2010

Nadomešča:
SIST EN 61978-1:2002

Optični spojni elementi in pasivne komponente - Optični pasivni kompenzatorji barvne razpršenosti - 1. del: Rodovna specifikacija (IEC 61978-1:2009)

Fibre optic interconnecting devices and passive components - Fibre optic passive chromatic dispersion compensators - Part 1: Generic specification (IEC 61978-1:2009)

Lichtwellenleiter - Verbindungselemente und passive Bauteile - Passive Lichtwellenleiter-Kompensatoren mit chromatischer Dispersion – Teil 1: Fachgrundspezifikation IEC 61978-1:2009)

Dispositifs d'interconnexion et composants passifs à fibres optiques - Compensateurs de dispersion chromatique passifs à fibres optiques -- Partie 1: Spécification générique CEI 61978-1:2009)

Ta slovenski standard je istoveten z: EN 61978-1:2010

ICS:

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

SIST EN 61978-1:2010

en,fr

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61978-1:2010

<https://standards.iteh.ai/catalog/standards/sist/fdca847a-24e5-41f5-aa4e-87ad844bb6d4/sist-en-61978-1-2010>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61978-1

March 2010

ICS 33.180.01

Supersedes EN 61978-1:2001

English version

**Fibre optic interconnecting devices and passive components -
Fibre optic passive chromatic dispersion compensators -
Part 1: Generic specification
(IEC 61978-1:2009)**

Dispositifs d'interconnexion et composants
passifs à fibres optiques -
Compensateurs de dispersion
chromatique passifs à fibres optiques -
Partie 1: Spécification générique
(CEI 61978-1:2009)

Lichtwellenleiter -
Verbindungselemente und passive
Bauteile - Passive Lichtwellenleiter-
Kompensatoren mit chromatischer
Dispersion -
Teil 1: Fachgrundspezifikation
(IEC 61978-1:2009)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

This European Standard was approved by CENELEC on 2010-03-01. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists 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 Central Secretariat 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 86B/2908/FDIS, future edition 2 of IEC 61978-1, 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 was approved by CENELEC as EN 61978-1 on 2010-03-01.

This European Standard supersedes EN 61978-1:2001.

Changes from EN 61978-1:2001 are to reconsider the requirements.

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) 2010-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2013-03-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61978-1:2009 was approved by CENELEC as a European Standard without any modification.

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

IEC 61300-1	NOTE Harmonized as EN 61300-1:2010
IEC 61300-2	NOTE Harmonized in EN 61300-2 series (not modified).
IEC 61300-3	NOTE Harmonized in EN 61300-3 series (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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 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	-	-
IEC 60050-731	-	International Electrotechnical Vocabulary (IEV) - Chapter 731: Optical fibre communication	-	-
IEC 60617	Series	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	EN 60695-11-5	-
IEC 60793-2-50	-	Optical fibres - Part 2-50: Product specifications - Sectional specification for class B single-mode fibres	EN 60793-2-50	-
IEC 60825	Series	Safety of laser products	EN 60825	Series
IEC 60869-1	-	Fibre optic attenuators - Part 1: Generic specification	EN 60869-1	-
IEC 60874	Series	Connectors for optical fibres and cables	EN 60874	Series
IEC 60974	Series	Arc welding equipment	EN 60974	Series
IEC 61073-1	-	Fibre optic interconnecting devices and passive components - Mechanical splices and fusion splice protectors for optical fibres and cables - Part 1: Generic specification	EN 61073-1	-
IEC 61300	Series	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures	EN 61300	Series
IEC 61754-4	-	Fibre optic connector interfaces - Part 4: Type SC connector family	EN 61754-4	-
IEC 61754-13	-	Fibre optic connector interfaces - Part 13: Type FC-PC connector	EN 61754-13	-
IEC 61754-15	-	Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 15: Type LSH connector family	EN 61754-15	-
IEC/TR 61930	-	Fibre optic graphical symbology	-	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC Guide 102	-	Electronic components - Specification structures for quality assessment (Qualification approval and capability approval)	-	-
IECQ 01	-	IEC Quality Assessment System for Electronic Components (IECQ) - Basic Rules	-	-
IEC QC 001002-3	-	IEC Quality Assessment System for Electronic Components (IECQ) - Rules of Procedure - Part 3: Approval procedures	-	-
ISO 129-1	-	Technical drawings - Indication of dimensions and tolerances - Part 1: General principles	-	-
ISO 286-1	-	ISO system of limits and fits - Part 1: Bases of tolerances, deviations and fits	EN 20286-1	-
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	-	-

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 61978-1:2010

<https://standards.iteh.ai/catalog/standards/sist/fdca847a-24e5-41f5-aa4e-87ad844bb6d4/sist-en-61978-1-2010>



IEC 61978-1

Edition 2.0 2009-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

Dispositifs d'interconnexion et composants passifs à fibres optiques – Compensateurs de dispersion chromatique passifs à fibres optiques – Partie 1: Spécification générique

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

U

ICS 33.180.01

ISBN 2-8318-1070-7

CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	7
3.1 Basic term	7
3.2 Component.....	7
3.3 Performance parameter	8
4 Requirements	10
4.1 General	10
4.2 Classification.....	10
4.2.1 Type	10
4.2.2 Style.....	11
4.2.3 Variant	12
4.2.4 Assessment level.....	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	15
4.3.4 Tests and measurements.....	15
4.3.5 Test data sheets.....	16
4.3.6 Instructions for use	16
4.4 Standardization system	16
4.4.1 Performance standards.....	16
4.4.2 Reliability standards	16
4.4.3 Interlinking	17
4.5 Design and construction	18
4.5.1 Materials	18
4.5.2 Workmanship.....	19
4.6 Performance.....	19
4.7 Identification and marking	19
4.7.1 Variant identification number	19
4.7.2 Component marking	19
4.7.3 Package marking.....	20
4.8 Packaging	20
4.9 Storage conditions	20
4.10 Safety	20
Annex A (informative) Example of dispersion compensating technologies	21
Bibliography.....	27
Figure 1 – Standards currently under preparation	18
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 μm for a step index core fibre	22
Figure A.3 – Examples of refractive index profile used in DCF	22

Figure A.4 – Illustration of the use of a chirped fibre Bragg grating for chromatic dispersion compensation	23
Figure A.5 – Zoom over 10 nm of the insertion loss spectrum including the optical circulator (Figure A.5 a)) and the group delay spectrum (Figure A.5 b)) of a multi-channel FBG tailored for the compensation of the chromatic dispersion accumulated over 100 km of single-mode fibre	24
Figure A.6 – Structure of virtually imaged phased array (VIPA).....	25
Figure A.7 – Detailed light path and mechanism of generating chromatic dispersion	25
Figure A.8 – Gires-Tournois interferometer	26
Table 1 – Types of passive chromatic dispersion compensators.....	11
Table 2 – Three-level IEC specification structure	14
Table 3 – Standards interlink matrix	18
Table 4 – Quality assurance options	18

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 61978-1:2010

<https://standards.iteh.ai/catalog/standards/sist/fdca847a-24e5-41f5-aa4e-87ad844bb6d4/sist-en-61978-1-2010>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 1: Generic specification

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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 second edition cancels and replaces the first edition published in 2000. It constitutes a technical revision. Changes from the previous edition of this standard are to reconsider the requirements.

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

FDIS	Report on voting
86B/2908/FDIS	86B/2946/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.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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
- amended.

IMPORTANT – The “colour inside” logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 61978-1:2010

<https://standards.iteh.ai/catalog/standards/sist/fdca847a-24e5-41f5-aa4e-87ad844bb6d4/sist-en-61978-1-2010>

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.

iTeh STANDARD PREVIEW

2 Normative references (standards.iteh.ai)

The following referenced documents are indispensable for the application 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 60027 (all parts), *Letter symbols to be used in electrical technology*

IEC 60050(731), *International Electrotechnical Vocabulary (IEV) – 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, *Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres*

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

IEC 60869-1, *Fibre optic attenuators - Part 1: Generic specification*

IEC 60874 (all parts), *Connectors for optical fibres and cables*

IEC 60974 (all parts), *Arc welding equipment*

IEC 61073-1, *Fibre optic interconnecting devices and passive components – Mechanical splices and fusion splice protectors for optical fibres and cables – Part 1: Generic specification*