IEC 61977

Edition 4.0 2020-04

REDLINE VERSION

colour inside

Fibre optic interconnecting devices and passive components – Fibre optic fixed filters – Generic specification

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.180.20

ISBN 978-2-8322-8186-4

Warning! Make sure that you obtained this publication from an authorized distributor.

® Registered trademark of the International Electrotechnical Commission

CONTENTS

FOREWORD 4
INTRODUCTION 6
1 Scope 7
2 Normative references 7
3 Terms and definitions 8
~~Basic terms ..... 8~~
3.1 Component terms 8
3.2 Performance terms 10
4 Requirements 14
4.1 Classification 14
4.1.1 General 14
4.1.2 Technology and function Type 15
4.1.3 Interface style 16
~~Variant ..... 14~~
~~Normative reference extensions ..... 14~~
4.2 Documentation 18
4.2.1 Symbols 18
~~Specification system ..... 18~~
4.2.2 Drawings 19
4.2.3 Tests and measurements 19
4.2.4 Test report 20
4.2.5 Instructions for use 20
4.3 Standardisation system 20
4.3.1 Interface standards 20
4.3.2 Performance standards 21
4.3.3 Reliability standards 21
~~Interlinking ..... 21~~
4.4 Design and construction 24
4.4.1 Materials 24
4.4.2 Workmanship 24
4.5 Quality 24
4.6 Performance requirements 24
4.7 Identification and marking 24
4.7.1 General 24
~~Variant identification number ..... 24~~
4.7.2 Component marking 24
4.7.3 Package marking 25
4.8 Packaging 25
4.9 Storage conditions 25
4.10 Safety 25
Annex A (informative) Example of etalon filter technology 27
A.1 Operating principle of etalon filter 27
A.2 Transmission characteristics of etalon filter 28
Annex B (informative) Example of fibre Bragg grating (FBG) filter technology 29
B.1 Operating principle of FBG 29
B.2 Example of usage of an FBG 30

Annex C (informative) Example of thin film filter technology 31
C.1 Example of thin film filter technology 31
C.2 Example of application of thin film filters 31
Annex D (informative) Examples of interface style 33
Bibliography 34
Figure 1 – Illustration of passband ripple 11
Figure 2 – Illustration of a stopband 12
Figure 3 – Illustration of maximum insertion loss within a passband 13
Figure 4 – Illustration of minimum insertion loss within a passband 13
Figure 5 – Illustration of X dB bandwidth 14
~~Figure 6 – Optic filter style configurations ..... .~~
~~Figure 7 – Standards currently under preparation ..... .~~
Figure A.1 – Schematic diagram of an etalon 27
Figure A.2 – Transmission characteristic of an etalon 28
Figure B.1 – Technology of a fibre Bragg grating 29
Figure B.2 – Application of an optical add/drop module 30
Figure B.3 – Application of an OTDR sensor 30
Figure B.4 – Application of the wavelength stabilizer for a 980 nm pump LD 30
Figure C.1 – Structure of a multilayer thin-film 31
Figure C.2 – Application for a GFF for an optical fibre amplifier 32
Figure C.3 – Application for a BPF for an optical fibre amplifier 32
Figure D.1 – Examples of interface style for fibre optic fixed filters 33

Table 1 – Example of a typical fibre optic fixed filter classification 15
~~Table 2 – The IEC specification structure ..... .~~
~~Table 3 – Standards interlink matrix ..... .~~
~~Table 4 – Quality assurance options ..... .~~

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – FIBRE OPTIC FIXED FILTERS – 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.

DISCLAIMER
This Redline version is not an official Standard and is intended to provide the user with an indication of what changes have been made to the previous version. Only the IEC International Standard provided in this package is to be considered the official Standard.

This Redline version provides you with a quick and easy way to compare all the changes between this standard and its previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 61977 has been prepared by subcommittee SC 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee TC 86: Fibre optics.

This fourth edition cancels and replaces the third edition published in 2015. This edition constitutes a technical revision.

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

a) change of the title and the scope for the limitation to fibre optic fixed filters;
b) addition of new terms and definitions reflecting new title;
c) removal of terms and definitions duplicated in IEC TS 62627-09;
d) harmonization of the vertical axis of Figures 1 to 5;
e) restructuration of Clause 4 reflecting the latest technical and market situation.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
86B/4267/FDIS	86B/4286/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document 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 document using a colour printer.

INTRODUCTION

There are two generic specifications for fibre optic filters: fibre optic fixed filters and fibre optic tuneable filters. This document focuses on fibre optic fixed filters. Fibre optic tuneable bandpass filter is standardized in IEC 63032.

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – FIBRE OPTIC FIXED FILTERS – GENERIC SPECIFICATION

1 Scope

This document applies to the family of fibre optic filters. These components have all of the following general features:

– they are passive for the reason that they contain no optoelectronic or other transducing elements which can process the optical signal launched into the input port;

– they modify the spectral intensity distribution in order to select some wavelengths and inhibit others;

– they are fixed, i.e. the modification of the spectral intensity distribution is fixed and cannot be tuned;

– they have input and output ports or a common port (having both functions of input and output) for the transmission of optical power; the ports are optical fibre or optical fibre connectors;

– they differ according to their characteristics. They can be divided into the following categories:

- short-wave pass (only wavelengths lower than or equal to a specified value are passed);
- long-wave pass (only wavelengths greater than or equal to a specified value are passed);
- band-pass (only an optical window is allowed);
- notch (only an optical window is inhibited);
- gain flattening (compensating the spectral profile of the device).

It is also possible to have a combination of the above categories.

This document provides the generic information including terminology of IEC 61753-04x series documents. Published IEC 61753-04x series documents are listed in the Bibliography.

This document establishes uniform requirements for optical, mechanical and environmental properties.

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.

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

IEC 60050-731, *International Electrotechnical Vocabulary (IEV) – Part 731: Optical fibre communication* (available at http://www.electropedia.org)

IEC 60617 ~~(all parts)~~, *Graphical symbols for diagrams* (available at http://std.iec.ch/iec60617)

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

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 TR 61930, *Fibre optic graphical symbology*

IEC TS 62627-09, *Fibre optic interconnecting devices and passive components – Vocabulary for passive optical devices*

ISO 129-1, *Technical ~~drawings~~ product documentation (TPD) – ~~Indication~~ Presentation 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*

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*~~

ISO 8601-1, *Date and time – Representations for information interchange – Part 1: Basic rules*

IEC 61977

Edition 4.0 2020-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fibre optic interconnecting devices and passive components – Fibre optic fixed filters – Generic specification

Dispositifs d'interconnexion et composants passifs fibroniques – Filtres fibroniques fixes – Spécification générique



IEC 61977:2020-04(en-fr)

CONTENTS

FOREWORD 4
INTRODUCTION 6
1 Scope 7
2 Normative references 7
3 Terms and definitions 8
3.1 Component terms 8
3.2 Performance terms 10
4 Requirements 14
4.1 Classification 14
4.1.1 General 14
4.1.2 Technology and function type 15
4.1.3 Interface style 15
4.2 Documentation 15
4.2.1 Symbols 15
4.2.2 Drawings 15
4.2.3 Tests and measurements 16
4.2.4 Test report 16
4.2.5 Instructions for use 16
4.3 Standardisation system 16
4.3.1 Interface standards 16
4.3.2 Performance standards 16
4.3.3 Reliability standards 16
4.4 Design and construction 17
4.4.1 Materials 17
4.4.2 Workmanship 17
4.5 Quality 17
4.6 Performance requirements 17
4.7 Identification and marking 17
4.7.1 General 17
4.7.2 Component marking 17
4.7.3 Package marking 17
4.8 Packaging 18
4.9 Storage conditions 18
4.10 Safety 18
Annex A (informative) Example of etalon filter technology 19
A.1 Operating principle of etalon filter 19
A.2 Transmission characteristics of etalon filter 20
Annex B (informative) Example of fibre Bragg grating (FBG) filter technology 21
B.1 Operating principle of FBG 21
B.2 Example of usage of an FBG 22
Annex C (informative) Example of thin film filter technology 23
C.1 Example of thin film filter technology 23
C.2 Example of application of thin film filters 23
Annex D (informative) Examples of interface style 25
Bibliography 26

Figure 1 – Illustration of passband ripple 11
Figure 2 – Illustration of a stopband 12
Figure 3 – Illustration of maximum insertion loss within a passband 12
Figure 4 – Illustration of minimum insertion loss within a passband 13
Figure 5 – Illustration of X dB bandwidth 14
Figure A.1 – Schematic diagram of an etalon 19
Figure A.2 – Transmission characteristic of an etalon 20
Figure B.1 – Technology of a fibre Bragg grating 21
Figure B.2 – Application of an optical add/drop module 22
Figure B.3 – Application of an OTDR sensor 22
Figure B.4 – Application of the wavelength stabilizer for a 980 nm pump LD 22
Figure C.1 – Structure of a multilayer thin-film 23
Figure C.2 – Application for a GFF for an optical fibre amplifier 24
Figure C.3 – Application for a BPF for an optical fibre amplifier 24
Figure D.1 – Examples of interface style for fibre optic fixed filters 25

Table 1 – Example of a typical fibre optic fixed filter classification 14

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – FIBRE OPTIC FIXED FILTERS – 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 61977 has been prepared by subcommittee SC 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee TC 86: Fibre optics.

This fourth edition cancels and replaces the third edition published in 2015. This edition constitutes a technical revision.

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

a) change of the title and the scope for the limitation to fibre optic fixed filters;
b) addition of new terms and definitions reflecting new title;
c) removal of terms and definitions duplicated in IEC TS 62627-09;
d) harmonization of the vertical axis of Figures 1 to 5;
e) restructuration of Clause 4 reflecting the latest technical and market situation.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
86B/4267/FDIS	86B/4286/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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

INTRODUCTION

There are two generic specifications for fibre optic filters: fibre optic fixed filters and fibre optic tuneable filters. This document focuses on fibre optic fixed filters. Fibre optic tuneable bandpass filter is standardized in IEC 63032.

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – FIBRE OPTIC FIXED FILTERS – GENERIC SPECIFICATION

1 Scope

This document applies to the family of fibre optic filters. These components have all of the following general features:

– they are passive for the reason that they contain no optoelectronic or other transducing elements which can process the optical signal launched into the input port;

– they modify the spectral intensity distribution in order to select some wavelengths and inhibit others;

– they are fixed, i.e. the modification of the spectral intensity distribution is fixed and cannot be tuned;

– they have input and output ports or a common port (having both functions of input and output) for the transmission of optical power; the ports are optical fibre or optical fibre connectors;

– they differ according to their characteristics. They can be divided into the following categories:

  - short-wave pass (only wavelengths lower than or equal to a specified value are passed);
  - long-wave pass (only wavelengths greater than or equal to a specified value are passed);
  - band-pass (only an optical window is allowed);
  - notch (only an optical window is inhibited);
  - gain flattening (compensating the spectral profile of the device).

It is also possible to have a combination of the above categories.

This document provides the generic information including terminology of IEC 61753-04x series documents. Published IEC 61753-04x series documents are listed in the Bibliography.

This document establishes uniform requirements for optical, mechanical and environmental properties.

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.

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

IEC 60050-731, *International Electrotechnical Vocabulary (IEV) – Part 731: Optical fibre communication* (available at http://www.electropedia.org)

IEC 60617, *Graphical symbols for diagrams* (available at http://std.iec.ch/iec60617)

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 TR 61930, *Fibre optic graphical symbology*

IEC TS 62627-09, *Fibre optic interconnecting devices and passive components – Vocabulary for passive optical devices*

ISO 129-1, *Technical product documentation (TPD) – Presentation 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*

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

ISO 8601-1, *Date and time – Representations for information interchange – Part 1: Basic rules*

SOMMAIRE

AVANT-PROPOS 30
INTRODUCTION 32
1 Domaine d'application 33
2 Références normatives 33
3 Termes et définitions 34
3.1 Termes concernant les composants 34
3.2 Termes concernant les performances 36
4 Exigences 40
4.1 Classification 40
4.1.1 Généralités 40
4.1.2 Type de technologie et de fonction 41
4.1.3 Modèle d'interface 41
4.2 Documentation 41
4.2.1 Symboles 41
4.2.2 Plans 41
4.2.3 Essais et mesures 42
4.2.4 Rapport d'essai 42
4.2.5 Instructions d'utilisation 42
4.3 Système de normalisation 42
4.3.1 Normes d'interface 42
4.3.2 Normes de performance 42
4.3.3 Normes de fiabilité 42
4.4 Conception et construction 43
4.4.1 Matériaux 43
4.4.2 Qualité d'exécution 43
4.5 Qualité 43
4.6 Exigences de performances 43
4.7 Identification et marquage 43
4.7.1 Généralités 43
4.7.2 Marquage des composants 43
4.7.3 Marquage de l'emballage 43
4.8 Emballage 44
4.9 Conditions de stockage 44
4.10 Sécurité 44
Annexe A (informative) Exemple de technologie de filtre étalon 45
A.1 Principe de fonctionnement du filtre étalon 45
A.2 Caractéristiques de transmission d'un filtre étalon 46
Annexe B (informative) Exemple de technologies de filtre à réseau de Bragg sur fibre (FBG) 47
B.1 Principe de fonctionnement du FBG 47
B.2 Exemple d'utilisation d'un FBG 48
Annexe C (informative) Exemple de technologie de filtre en couche mince 49
C.1 Exemple de technologie de filtre en couche mince 49
C.2 Exemple d'application de filtres en couche mince 49
Annexe D (informative) Exemples de modèles d'interfaces 51

Bibliographie 52

Figure 1 – Représentation de l'ondulation de la bande passante 37
Figure 2 – Représentation d'une bande d'arrêt 38
Figure 3 – Représentation de la perte d'insertion maximale à l'intérieur d'une bande passante 38
Figure 4 – Représentation de la perte d'insertion minimale à l'intérieur d'une bande passante 39
Figure 5 – Représentation de la largeur de bande à X dB 40
Figure A.1 – Représentation schématique d'un étalon 45
Figure A.2 – Caractéristique de transmission d'un étalon 46
Figure B.1 – Technologie du réseau de Bragg sur fibre 47
Figure B.2 – Application d'un module d'ajout/suppression de composante optique 48
Figure B.3 – Application d'un capteur de type OTDR 48
Figure B.4 – Application du stabilisateur de longueur d'onde pour une diode laser pompée à 980 nm 48
Figure C.1 – Structure d'une couche mince multicouche 49
Figure C.2 – Application d'un GFF pour un amplificateur à fibres optiques 50
Figure C.3 – Application d'un BPF pour un amplificateur à fibres optiques 50
Figure D.1 – Exemples de modèles d'interfaces pour filtres fibroniques fixes 51

Tableau 1 – Exemple de classification typique de filtres fibroniques fixes 40

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

_____

DISPOSITIFS D'INTERCONNEXION ET COMPOSANTS PASSIFS FIBRONIQUES – FILTRES FIBRONIQUES FIXES – SPÉCIFICATION GÉNÉRIQUE

AVANT-PROPOS

1) La Commission Electrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. A cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
2) Les décisions ou accords officiels de l'IEC concernant les questions techniques représentent, dans la mesure du possible, un accord international sur les sujets étudiés, étant donné que les Comités nationaux de l'IEC intéressés sont représentés dans chaque comité d'études.
3) Les Publications de l'IEC se présentent sous la forme de recommandations internationales et sont agréées comme telles par les Comités nationaux de l'IEC. Tous les efforts raisonnables sont entrepris afin que l'IEC s'assure de l'exactitude du contenu technique de ses publications; l'IEC ne peut pas être tenue responsable de l'éventuelle mauvaise utilisation ou interprétation qui en est faite par un quelconque utilisateur final.
4) Dans le but d'encourager l'uniformité internationale, les Comités nationaux de l'IEC s'engagent, dans toute la mesure possible, à appliquer de façon transparente les Publications de l'IEC dans leurs publications nationales et régionales. Toutes divergences entre toutes Publications de l'IEC et toutes publications nationales ou régionales correspondantes doivent être indiquées en termes clairs dans ces dernières.
5) L'IEC elle-même ne fournit aucune attestation de conformité. Des organismes de certification indépendants fournissent des services d'évaluation de conformité et, dans certains secteurs, accèdent aux marques de conformité de l'IEC. L'IEC n'est responsable d'aucun des services effectués par les organismes de certification indépendants.
6) Tous les utilisateurs doivent s'assurer qu'ils sont en possession de la dernière édition de cette publication.
7) Aucune responsabilité ne doit être imputée à l'IEC, à ses administrateurs, employés, auxiliaires ou mandataires, y compris ses experts particuliers et les membres de ses comités d'études et des Comités nationaux de l'IEC, pour tout préjudice causé en cas de dommages corporels et matériels, ou de tout autre dommage de quelque nature que ce soit, directe ou indirecte, ou pour supporter les coûts (y compris les frais de justice) et les dépenses découlant de la publication ou de l'utilisation de cette Publication de l'IEC ou de toute autre Publication de l'IEC, ou au crédit qui lui est accordé.
8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
9) L'attention est attirée sur le fait que certains des éléments de la présente publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets et averti de leur existence.

La Norme Internationale IEC 61977 a été établie par le sous-comité SC 86B: Dispositifs d'interconnexion et composants passifs à fibres optiques, du comité d'études 86 de l'IEC: Fibres optiques.

Cette quatrième édition annule et remplace la troisième édition parue en 2015 dont elle constitue une révision technique.

La présente édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) modification du titre et du domaine d'application pour limiter le présent document aux filtres fibroniques fixes;
b) introduction de nouveaux termes et définitions pour refléter le nouveau titre;
c) suppression des termes et définitions présents dans l'IEC TS 62627-09;

d) harmonisation de l'axe vertical des Figures 1 à 5;

e) restructuration de l'Article 4 pour refléter les dernières situations techniques et du marché.

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
86B/4267/FDIS	86B/4286/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette Norme internationale.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "http://webstore.iec.ch" dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

INTRODUCTION

Il existe deux spécifications génériques pour les filtres fibroniques: une pour les filtres fibroniques fixes et une pour les filtres fibroniques accordables. Le présent document porte sur les filtres fibroniques fixes. Les filtres fibroniques passe-bande accordables font l'objet de la norme IEC 63032.

DISPOSITIFS D'INTERCONNEXION ET COMPOSANTS PASSIFS FIBRONIQUES – FILTRES FIBRONIQUES FIXES – SPÉCIFICATION GÉNÉRIQUE

1 Domaine d'application

Le présent document s'applique à la famille des filtres fibroniques. Ces composants possèdent l'ensemble des caractéristiques générales suivantes:

– ils sont passifs du fait qu'ils ne contiennent aucun élément optoélectronique ou autres éléments transducteurs susceptibles de traiter le signal optique injecté dans le port d'entrée;
– ils modifient la distribution d'intensité spectrale afin de sélectionner certaines longueurs d'onde et en interdire d'autres;
– ils sont fixes, c'est-à-dire que la modification de la distribution de l'intensité spectrale est constante et ne peut donc être accordée;
– ils comportent des ports d'entrée et de sortie ou un port commun (comportant à la fois les fonctions d'entrée et de sortie) pour la transmission de la puissance optique; les ports sont une fibre optique ou des connecteurs à fibres optiques;
– ils diffèrent en fonction de leurs caractéristiques. Ils peuvent être répartis dans les catégories suivantes:
    - passe-bas (seules les longueurs d'onde inférieures ou égales à une valeur spécifiée sont transmises);
    - passe-haut (seules les longueurs d'onde supérieures ou égales à une valeur spécifiée sont transmises);
    - passe-bande (seule une fenêtre optique est autorisée);
    - coupe-bande (seule une fenêtre optique est interdite);
    - aplanissement de gain (compensation du profil spectral du dispositif).

Une combinaison des catégories ci-dessus est également possible.

Le présent document fournit des informations génériques et notamment la terminologie des documents de la série IEC 61753-04x. Les documents publiés de la série IEC 61753-04x sont indiqués dans la Bibliographie.

Le présent document établit des exigences uniformes pour les propriétés optiques, mécaniques et environnementales.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60027 (toutes les parties), *Symboles littéraux à utiliser en électrotechnique*

IEC 60050-731, *Vocabulaire électrotechnique international (IEV) – Partie 731: Télécommunications par fibres optiques* (disponible sur le site http://www.electropedia.org)

IEC 60617, *Symboles graphiques pour schémas* (disponible sur le site http://std.iec.ch/iec60617)

IEC 60825 (toutes les parties), *Sécurité des appareils à laser*

IEC 61300 (toutes les parties), *Dispositifs d'interconnexion et composants passifs fibroniques – Méthodes fondamentales d'essais et de mesures*

IEC TR 61930, *Symbologie des graphiques de fibres optiques*

IEC TS 62627-09, *Fibre optic interconnecting devices and passive components – Vocabulary for passive optical devices* (disponible en anglais seulement)

ISO 129-1, *Documentation technique de produits – Représentation des dimensions et tolérances – Partie 1: Principes généraux*

ISO 286-1, *Spécification géométrique des produits (GPS) – Système de codification ISO pour les tolérances sur les tailles linéaires – Partie 1: Bases des tolérances, écarts et ajustements*

ISO 1101, *Spécification géométrique des produits (GPS) – Tolérancement géométrique – Tolérancement de forme, orientation, position et battement*

ISO 8601-1, *Date et heure – Représentations pour l'échange d'information – Partie 1: Règles de base*