



NSAI
Standards

Irish Standard
I.S. EN 60793-1-42:2013

Optical fibres -- Part 1-42:
Measurement methods and test
procedures - Chromatic dispersion (IEC
60793-1-42:2013 (EQV))

I.S. EN 60793-1-42:2013

Incorporating amendments/corrigenda issued since publication:

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I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

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EUROPEAN STANDARD

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EUROPÄISCHE NORM

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ICS 33.180.10

Supersedes EN 60793-1-42:2007

English version

**Optical fibres -
Part 1-42: Measurement methods and test procedures -
Chromatic dispersion
(IEC 60793-1-42:2013)**

Fibres optiques -
Partie 1-42: Méthodes de mesure
et procédures d'essai -
Dispersion chromatique
(CEI 60793-1-42:2013)

Lichtwellenleiter -
Teil 1-42: Messmethoden
und Prüfverfahren -
Chromatische Dispersion
(IEC 60793-1-42:2013)

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 86A/1419/CDV, future edition 3 of IEC 60793-1-42, prepared by SC 86A "Fibres and cables" of IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60793-1-42:2013.

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) 2013-11-28
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-02-28

This document supersedes EN 60793-1-42:2007.

EN 60793-1-42:2013 includes the following significant technical changes with respect to EN 60793-1-42:2007:

- a) the inclusion of category B6 single-mode fibres;
- b) the deletion of test method D (interferometry).

This standard should be read in conjunction with EN 60793-1-1.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 60793-1-42:2013 was approved by CENELEC as a European Standard without any modification.

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 60793-1-1	2008	Optical fibres - Part 1-1: Measurement methods and test procedures - General and guidance	EN 60793-1-1	2008
IEC 60793-1-41	-	Optical fibres - Part 1-41: Measurement methods and test procedures - Bandwidth	EN 60793-1-41	-
IEC 60793-2	-	Optical fibres - Part 2: Product specifications - General	EN 60793-2	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

OPTICAL FIBRES –

Part 1-42: Measurement methods and test procedures – Chromatic dispersion

FOREWORD

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International Standard IEC 60793-1-42 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

This third edition cancels and replaces the second edition, published in 2007. It constitutes a technical revision.

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

- a) the inclusion of category B6 single-mode fibres;
- b) the deletion of test method D (interferometry).

This standard should be read in conjunction with IEC 60793-1-1.

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

CDV	Report on voting
86A/1419/CDV	86A/1443/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 the parts in the IEC 60793 series, published under the general title *Optical fibres*, 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
- amended.

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OPTICAL FIBRES –

Part 1-42: Measurement methods and test procedures – Chromatic dispersion

1 Scope

This part of IEC 60793 establishes uniform requirements for measuring the chromatic dispersion of optical fibre, thereby assisting in the inspection of fibres and cables for commercial purposes.

Chromatic dispersion varies with wavelength. Some methods and implementations measure the group delay as a function of wavelength and the chromatic dispersion and dispersion slope are deduced from the derivatives (with respect to wavelength) of this data. This differentiation is most often done after the data are fitted to a mathematical model. Other implementations can allow direct measurement (of the chromatic dispersion) at each of the required wavelengths.

For some (sub-) categories of fibre, the chromatic dispersion attributes are specified with the parameters of a specific model. In these cases, the relevant recommendation or standard defines the model appropriate for the definition of the specified parameters. For other fibre (sub-) categories, the dispersion is specified to be within a given range for one or more specified wavelength intervals. In the latter case, either direct measurements may be made at the wavelength extremes or some fitting model may be used to either allow group delay measurement methods or implementations, or to allow storage of a reduced set of parameters that may be used to calculate the interpolated dispersion for particular wavelengths which may not have actual direct measurement values.

Annex D gives a general description of chromatic dispersion fitting and outlines a number of fitting equations suitable for use with any of the measurement methods or fibre categories.

This standard gives three methods for measuring chromatic dispersion:

- method A: phase shift;
- method B: spectral group delay in the time domain;
- method C: differential phase shift.

Methods A, B, and C apply to the measurement of chromatic dispersion of the following fibres from IEC 60793-2 over a specified wavelength range:

- category A1 graded-index multimode fibres;
- sub-category A4f, A4g and A4h multimode fibres;
- category B1, B2, B4, B5 and sub-categories B6_a1 and B6_a2 single-mode fibres.

The methods can be applied to laboratory, factory and field measurements of chromatic dispersion, and the wavelength range of the measurements can be tailored as required. Measurements are made at temperature as stated in Table 1 of IEC 60793-1-1:2008, Standard range of atmospheric conditions.

The methods are suitable for fibre or cable lengths greater than 1 km. They may also be applied to shorter lengths, but accuracy and repeatability may be compromised.

Information common to all methods is contained in Clauses 1 to 8, and information pertaining to each individual method appears in Annexes A, B and C, respectively.

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