Optical fibres -- Part 1-20: Measurement methods and test procedures - Fibre geometry

EESTI STANDARDIKESKUS
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NATIONAL FOREWORD

See Eesti standard EVS-EN 60793-1-20:2014 sisaldab Euroopa standardi EN 60793-1-20:2014 inglisekeelset teksti.	This Estonian standard EVS-EN 60793-1-20:2014 consists of the English text of the European standard EN 60793-1-20:2014.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 21.11.2014.	Date of Availability of the European standard is 21.11.2014.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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Optical fibres - Part 1-20: Measurement methods and test procedures - Fibre geometry (IEC 60793-1-20:2014)

Fibres optiques - Partie 1-20: Méthodes de mesure et procédures d'essai - Géométrie de la fibre (CEI 60793-1-20:2014)

Lichtwellenleiter - Teil 1-20: Messmethoden und Prüfverfahren - Fasergeometrie (IEC 60793-1-20:2014)

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

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Foreword

The text of document 86A/1562/CDV, future edition 1 of IEC 60793-1-20, 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 60793-1-20:2014.

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) 2015-08-14
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-11-14

This document supersedes EN 60793-1-20:2002.

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 60793-1-20:2014 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated :

IEC 60793-1-45	NOTE	Harmonized as EN 60793-1-45.

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 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60793-2-10	-	Optical fibres - Part 2-10: Product specifications - Sectional specification for category A1 multimode fibres	EN 60793-2-10	-
IEC 60793-2-20	-	Optical fibres - Part 2-20: Product specifications - Sectional specification for category A2 multimode fibres	EN 60793-2-20	-
IEC 60793-2-30	-	Optical fibres - Part 2-30: Product specifications - Sectional specification for category A3 multimode fibres	EN 60793-2-30	-
IEC 60793-2-40	-	Optical fibres - Part 2-40: Product specifications - Sectional specification for category A4 multimode fibres	EN 60793-2-40	-
IEC 60793-2-50	-	Optical fibres - Part 2-50: Product specifications - Sectional specification for class B single-mode fibres	EN 60793-2-50	-
IEC 60793-2-60	-	Optical fibres - Part 2-60: Product specifications - Sectional specification for category C single-mode intraconnection fibres	EN 60793-2-60	-
IEC 61745	-	End-face image analysis procedure for the calibration of optical fibre geometry test sets	-	-

CONTENTS

INTRODUCTION

This standard gives two methods for measuring fibre geometry characteristics:

– Method A: Refracted near-field, described in Annex A;

– Method B: Transmitted near-field, described in Annex B.

Methods A and B apply to the geometry measurement of all class A multimode fibres, class B single-mode fibres and class C single-mode interconnection fibres. The fibre's applicable product specifications, IEC 60793-2-10, IEC 60793-2-20, IEC 60793-2-30, IEC 60793-2-40, IEC 60793-2-50 and IEC 60793-2-60, provide relevant measurement details, including sample lengths and k factors.

The geometric parameters measurable by the methods described in this standard are as follows:

– cladding diameter;

– cladding non-circularity;

– core diameter (class A fibre only);

– core non-circularity (class A fibre only);

– core-cladding concentricity error.

NOTE 1 The core diameter of class B and class C fibres is not specified. The equivalent parameter is mode field diameter, determined by IEC 60793-1-45.

NOTE 2 These methods specify both one-dimensional (1-D) and two-dimensional (2-D) data collection techniques and data analyses. The 1-D methods by themselves cannot detemine non-circularity nor concentricity error. When non-circular bodies are measured with 1-D methods, body diameters suffer additional uncertainties. These limitations may be overcome by scanning and analysing multiple 1-D data sets. Clause 5 provides further information.

Information common to both methods appears in Clauses 2 through 10, and information pertaining to each individual method appears in Annexes A and B, respectively. Annex C describes normative methods used to find the optical boundaries of the core and the cladding, Annex D describes normative procedures to fit ellipses to sets of detected boundaries. Annex E provides an informative fitting procedure of power-law models to graded-index core profiles. Annex F describes an informative methodology relating to the transformation of core diameter measurements determined with methods other than the reference method to approximate reference method values.