

BS EN 61300-3-43:2009



BSI Standards Publication

Fibre optic interconnecting devices and passive components – Basic test and measurement procedures

Part 3-43: Examinations and measurements – Mode transfer function measurement for fibre optic sources

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National foreword

This British Standard is the UK implementation of EN 61300-3-43:2009. It is identical to IEC 61300-3-43:2009. It supersedes DD IEC/PAS 61300-3-43:2006 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee GEL/86, Fibre optics, to Subcommittee GEL/86/2, Fibre optic interconnecting devices and passive components.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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English version

**Fibre optic interconnecting devices and passive components -
Basic test and measurement procedures -
Part 3-43: Examinations and measurements -
Mode transfer function measurement for fibre optic sources
(IEC 61300-3-43:2009)**

Dispositifs d'interconnexion
et composants passifs à fibres optiques -
Méthodes fondamentales d'essais
et de mesures -
Partie 3-43: Examens et mesures -
Mesures de la fonction de transfert
de modes pour les sources
à fibres optiques
(CEI 61300-3-43:2009)

Lichtwellenleiter -
Verbindungselemente
und passive Bauteile -
Grundlegende Prüf- und Messverfahren -
Teil 3-43: Untersuchungen
und Messungen -
Messung der Moden-Transferfunktion
bei Lichtwellenleiterquellen
(IEC 61300-3-43:2009)

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

Central Secretariat: avenue Marnix 17, B - 1000 Brussels

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Foreword

The text of document 86B/2780/FDIS, future edition 1 of IEC 61300-3-43, 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 61300-3-43 on 2009-04-01.

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) 2010-01-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2012-04-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61300-3-43:2009 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 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 60793-1-20	- ¹⁾	Optical fibres - Part 1-20: Measurement methods and test procedures - Fibre geometry	EN 60793-1-20	2002 ²⁾
IEC 61300-1	- ¹⁾	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 1: General and guidance	EN 61300-1	2003 ²⁾
IEC 61300-3-4	- ¹⁾	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-4: Examinations and measurements - Attenuation	EN 61300-3-4	2001 ²⁾

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

CONTENTS

1	Scope.....	5
2	Normative references	5
3	General description	5
4	Theory.....	5
4.1	Alternative method	7
4.2	Mode power distribution	7
4.3	Constraints.....	8
5	Apparatus.....	9
5.1	General.....	9
5.2	Test sample	9
5.3	Sample positioning device.....	9
5.4	Optical system.....	10
5.5	Camera	10
5.6	Video digitiser	10
5.7	Calibration.....	10
6	Procedure	11
6.1	Mounting and aligning the sample	11
6.2	Optimisation	11
6.3	Acquiring the data	11
7	Calculations	11
7.1	Background level subtraction.....	11
7.2	Location of centroid of intensity profile	12
7.3	Differentiating the intensity profile	12
7.4	Computing the MTF	13
8	Results	14
	Annex A (informative)	16
	Bibliography.....	18
	Figure 1 – Example of normalised MTF.....	7
	Figure 2 – Example of normalised MPD	8
	Figure 3 – Schematic of measurement apparatus.....	9
	Figure 4 – Location of fibre centre using symmetry computation	13
	Figure A.1 – Sensitivity of MTF and MPD to core diameter.....	16
	Figure A.2 – Sensitivity of MTF and MPD to profile factor	17

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS ± BASIC TEST AND MEASUREMENT PROCEDURES ±

Part 3-43: Examinations and measurements ± Mode transfer function measurement for fibre optic sources

1 Scope

This part of IEC 61300 describes the method for measuring the mode transfer function (MTF) to be used in characterising the launch conditions for measurements of attenuation and or return loss of multimode passive components. The MTF may be measured at the operational wavelengths.

2 Normative references

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 61300-1, *Fibre optic interconnecting devices and passive components ± Basic test and measurement procedures ± Part 1: General and guidance*

IEC 61300-3-4, *Fibre optic interconnecting devices and passive components ± Basic test and measurement procedures – Part 3-4: Examination and measurements ± Attenuation*

IEC 60793-1-20, *Optical fibres ± Part 1-20: Measurement methods and test procedures ± Fibre geometry*

3 General description

The modal distribution launched into multimode fibre can vary widely with different light sources. This variation in launched modal distribution can result in significant differences in measured attenuation in the same component. The MTF test method gives information about the launched modal distribution (LMD) condition in a measured component. The MTF test method is based on a measurement of the near-field intensity distribution in the fibre [1], [2]¹.

4 Theory

For a fibre with a power-law index profile $n(r)$, given by,

$$n(r) = n_1 \left[1 - 2\Delta \left(\frac{r}{a} \right)^\alpha \right]^{0,5} \left(\frac{r}{a} \right) \leq 1 \quad (1)$$

where

a is the fibre core radius;

α is the profile factor ($\alpha = 2$ for a parabolic profile);

¹ Figures in square brackets refer to the Bibliography.