



SLOVENSKI STANDARD
SIST EN 188200:1999

01-maj-1999

Sectional Specification: Optical fibres A1 category graded index multimode

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Rahmenspezifikation: Mehrmoden-Lichtwellenleiter - Kategorie A1

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Ta slovenski standard je istoveten z: EN 188200:1995

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ICS:

33.180.10 **Optična vlakna in kablovi** Fibres and cables

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 188200

September 1995

ICS 33.180.10

Descriptors: Quality, electronic components, optical fibres

English version

**Sectional Specification:
Optical fibres A1 category graded index multimode**

(n'existe pas encore en français)

Rahmenspezifikation:
Mehrmoden-Lichtwellenleiter
Kategorie A1

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This European Standard was approved by CENELEC on 1995-07-04. 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard was prepared by Working Group CLC/TC CECC/WG 28.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 188200 on 1995-07-04.

This standard completes the EN 188000 series (Sectional and Family Specifications).

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) 1996-07-15
 - latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 1997-07-15
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1. Scope

This document provides Sectional Specifications for category A1 primary coated optical graded index multimode fibres. Four types of fibres fall under this class with the following typical core / cladding diameter:

A1a:	50	/	125	µm
A1b:	62,5	/	125	µm
A1c:	85	/	125	µm
A1d:	100	/	140	µm.

This Sectional Specification should also be used in combination with the relevant Family Specifications for A1a, A1b, A1c or A1d type multimode fibres.

Fibres dealt within this document are intended to be used primarily in data networks; however, they can also be considered for other types of applications.

2. References

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2.1 Normative references

The following document is mentioned in this specification, and shall be consulted when more details on test methods are necessary:

EN 188000	1993	Generic specification: optical fibres.
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2.2 Related references

The following documents are not directly mentioned, however, they are related with the subject of this specification and can be consulted for general information:

ITU-T (former CCITT) Recommendation G.650	Definition and test methods for the relevant parameters of single-mode fibres.
ITU-T (former CCITT) Recommendation G.651	Characteristics of a 50/125 µm multimode optical fibre cable.
IEC 86(Sec)33	Fibre Optic Terminology.

3. Materials

The substance of which the Al-type fibres are made should be indicated.

3.1 Core and Cladding material

The fibre shall consist of a (doped) silica glass core and cladding. The refractive index of the core region shall describe a near parabolic function, see EN 188000, clause 1.4.1, table I. A typical profile plot shall be given, if required.

3.2 Coating Material

The cladding shall be coated by a suitable material, e.g. UV-cured acrylic resins, typically in two layers. Before cabling, fibres are usually coated by another layer (e.g. coloured inks or resins). This further layer is not considered here.

The coating shall be in close contact with the cladding surface in order to preserve the initial integrity of the surface.

The coating shall be removable for connecting purposes, and the method of removal shall be suggested by the manufacturer.

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4. Dimensions

The actual values and tolerances of the glass and coating dimensions are reported in the relevant Family Specifications.

4.1 Glass dimensions test method

According to EN 188000 Method 101 or 102 in combination with the operational definition of the multimode core diameter (clause 2.5.1 of EN 188000). Using Method 102 (Near field light distribution) without profile fit, the k-factor is typically 0,025.

NOTE: For Method 102 the amendment of Method IEC 793-1-A2 should be used*.

4.2 Coating dimensions test method

According to the Method IEC 793-1-A3 "Side view light distribution for primary coating"*.

4.3 Length test method

According to EN 188000 Method 105, 106 or 303.

*) presently document IEC 86A/301/DIS.

5. Optical Parameters

Optical characterisation of category A1 multimode fibres is carried out through the evaluation of the parameters listed in the following; if required, the actual values are reported in the relevant Family Specifications.

5.1 Group Index (N)

The group index is defined as the ratio between the velocity of light in vacuum and the velocity of a light pulse propagating into the fibre. For a plane wave of wavelength λ it is the refractive index n according to:

$$N = n - \lambda \cdot (dn/d\lambda)$$

The manufacturer should provide, if requested, typical values of the effective group index N_{eff} , which is related to N and to the actual propagation of the light into the fibre, at the wavelengths 850 nm and 1300 nm, and indicate the test method used.

5.2 Attenuation coefficient

5.2.1 Test method

According to EN 188000 Method 301 and 303. The wavelength at which the attenuation is measured is typically 850 nm and 1300 nm as specified in the Family Specifications, unless otherwise agreed between the user and the manufacturer.

The following remarks apply:

- In case of controversy, cut-back measurements shall be accepted as correct.
- Using method 303 (Backscattering), both the automatic two-point subtraction and the least squares linear line fit are accepted. Whenever possible, however, preference is given to the latter; if required the technique adopted shall be stated in the results.

5.3 Modal Bandwidth

5.3.1. Test method

According to EN 188000 Method 304 or 305, taking into account the operational definitions in EN 188000 clause 4.9. The wavelength at which the bandwidth is measured is typically 850 nm and 1300 nm as specified in the Family Specifications, unless otherwise agreed between the user and the manufacturer. The following remarks apply:

- The bandwidth should be regarded as the modal bandwidth; the influence of the chromatic dispersion bandwidth is indicated in EN 188000, clause 4.8.
- The modal bandwidth is linearly normalised to 1 km (linear product of modal bandwidth in MHz * length in km), for categorizing the product for the sake of trade and commerce.

5.4 Chromatic Dispersion

If required, the manufacturer should indicate the typical chromatic dispersion coefficient of the fibre type at 850 nm and 1300 nm.

5.4.1 Test method

According to EN 188000 Method 309.

5.5 Numerical Aperture

5.5.1 Test method

According to EN 188000 Method 311.

6. Mechanical Parameters

Mechanical characterisation of category A1 multimode fibres is carried out through the evaluation of the parameters listed in the following. Where only the definitions and / or the test methods have been given, it is intended that the actual values and tolerances are reported in the relevant Family Specifications.

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6.1 Proof test

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6.1.1 Definition

Each fibre is submitted for its entire length to the required elongation, except for the maximum 50 m at each end.

6.1.2 Test method

According to EN 188000 Method 201.

6.1.3 Requirement

Elongation categories: $\geq 0,5$ %
 ≥ 1 %.

6.2 Coating stripping force

6.2.1 Definition

The average force required to remove the primary coating from the fibre by means of a suitable mechanical tool is called the stripping force.

6.2.2 Test method

According to EN 188000 Method 206, where:

stripping speed = 500 mm/min

length of the sample to be stripped: 50 mm.

6.2.3 Requirement

To be agreed between user and manufacturer.