SLOVENSKI STANDARD

SIST EN 187104:2004

september 2004

Rodovne specifikacije - Kabli iz enordnih optičnih vlaken, ki se uporabljajo kot podvodni kabli pri prečenju jezer in rek, itd.*

Family specification - Single-mode optical fibre cables to be used as underwater cables for lakes and river crossings etc.

ICS 33.180.10

Referenčna številka
SIST EN 187104:2004(en)

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 187104

August 2001

ICS 33.180.10

English version

Family specification
Single-mode optical fibre cables to be used as underwater cables for lakes and river crossings, etc.

Spécification de famille
Câbles à fibres optiques monomodales utilisés en tant que câbles immergés pour les lacs et les traversées sous-fluviales, etc.

Familienspezifikation
Einmoden-Lichtwellenleiterkabel, die als Unterwasserkabel für die Durchquerung von Seen und Flüssen angewendet werden

This European Standard was approved by CENELEC on 2000-11-01. 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, Czech Republic, 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

Ref. No. EN 187104:2001 E

Contents

Foreword

This standard has been produced in accordance with a specialised agreement on work repartition and co-operation for standardisation concerning fibre optics and is part of the CEN/CENELEC/ETSI (European Telecommunications Standards Institute) co-operation agreement.

It uses information provided by the ETSI on functional and system related aspects by means of an Interim European Telecommunication Standard (I-ETS).

The document I-ETS 300 634 : Single-mode optical fibre cables to be used as underwater cables for lakes and river crossings etc., prepared by ETSI/TM1/WG1, has been reviewed and completed by the CENELEC TC 86A for incorporation within the set of EN 1871xx. Standards prepared using a similar process.

This European Standard, prepared by the Technical Committee CENELEC TC 86A, Optical fibres and optical fibre cables, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 187104 on 2000-11-01.

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) 2002-03-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2003-11-01

1 Scope

This family specification covers optical telecommunication cables to be used as underwater cables. Types of cables included in this family specification are "underwater cables" for lakes, river crossings etc. and are for cable systems without power feeding requirements. This specification does not cover repair capability. Requirements of the sectional specification for optical telecommunication cables EN 187100 (EN 60794-3) are applicable to cables covered by this standard.

Clause 5 of this standard describes a blank detail specification for optical telecommunication cables to be used as underwater cables. It incorporates some minimum requirements common to all European Countries.

Detail specifications may be prepared based on this family specification following in particular requirements of clause 5.

2 General

The parameters specified in this standard may be affected by measurement uncertainty arising either from measurement errors or calibration errors due to lack of suitable standards. Acceptance criteria shall be interpreted with respect to this consideration. The total uncertainty of measurement for this standard shall be less than or equal to 0,05 dB for attenuation.

The expression of no change in attenuation means that any change in measurement value either positive or negative, within the uncertainty of measurement shall be ignored.

The number of fibres tested shall be representative of the cable design and shall be agreed between the user and the manufacturer.

3 Normative references

This European Standard incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references subsequent amendments to, or revisions of any of these publications apply to this European Standard only when incorporated in it by reference or revision. For undated references the latest edition of the publication referred to applies.

EN 60794-1-2	1999	Optical fibre cables - Part 1-2: Generic specification - Basic optical cable test procedures (IEC 60794-1-2:1999)
EN 60794-3	1998	Optical fibre cables - Part 3: Duct, buried & aerial cables -Sectional specification (IEC 60794-3:1998)
EN 60811-4-2	1999	Insulating and sheating materials of electric and optical fibre cables -- Common test methods - Part 4: Methods specific to polyethylene and polypropylene compounds (IEC 60811-4-2:1990, mod.)
EN 60811-5-1	1999	Common test methods for insulating and sheathing materials of electric cables - Part 5: Methods specific to filling compounds (IEC 60811-5-1:1990, mod.)
EN 187000		Generic specification: Optical fibre cables
EN 188000		Generic specification: Optical fibres
EN 188100	1995	Sectional specification: Single-mode (SM) optical fibre
EN 188101	1995	Family specification: Single-mode dispersion unshifted (B1.1) optical fibre

EN 188102	1995	Family specification: Single-mode dispersion shifted (B1.2) optical fibre
EN 188103[1)]		Family specification: Single-mode non zero dispersion shifted (B4) optical fibre
IEC 60304	1982	Standard colours for insulation for low-frequency cables and wires (harmonized as HD 402 S2:1984)
IEC 60708-1		Low-frequency cables with polyolefin insulation and moisture barrier polyolefin sheath - Part 1: General design details and requirements

4 Symbols and abbreviations

4.1 Symbols

For the purposes of this Standard, the following symbols apply :

λ_{cc} Cabled fibre cut-off wavelength

SZ A technique in which the lay reverses direction periodically

T_0 Threshold below which no attenuation and/or fibre strain increase should occur in the tensile strength test

T_m The acceptable amount of transient stress that can be applied to the cable without permanent degradation of the characteristics of the fibres in the tensile strength test

T_{A1} Temperature cycling lower limit for acceptance criteria 1

T_{A2} Temperature cycling lower limit for acceptance criteria 2

T_{B1} Temperature cycling upper limit for acceptance criteria 1

T_{B2} Temperature cycling upper limit for acceptance criteria 2

t_1 Temperature cycling test dwell time

4.2 Abbreviations

EN Europäische Norm (European Standard)

HD Harmonized Document

IEC International Electrotechnical Commission

[1)] In preparation

5 Family specification for optical telecommunication cables to be used as underwater cables (Blank detail specification and minimum requirements)

5.1 Cable description

(1) Prepared by		(2) Document N° : Issue : Date :
(3) Available from :	(4) Generic specification : EN 187000 Sectional specification : EN 60794-3	
(5) Additional references :		
(6) Cable description : (Drawing)		
(7) Cable construction :		
OPTICAL FIBRES		
RANGE OF FIBRE COUNT		
MODULARITY		
CONSTRUCTION - Single coloured fibre S-c-f - Tube - filled F-l-t - Tube - unfilled U-l-t - Slotted core - filled F-s-c - Slotted core - unfilled U-s-c - Tight secondary coating T-s-c - Ribbon in slotted core R-s-c - Ribbon in tube R-l-t - Central (strength) member - metallic M-c-m - Central (strength) member - non metallic N-m-c-m - Core filling - continuous C-f - Core filling - regular water blocking R-b Lay-up - Stranding (helical or SZ) Str - Single unit S-u - Hybrid configuration H-c ……..		Additional remarks

(7) Cable construction (continued)		Additional remarks
<u>Conductors</u> ……..		
<u>Inner sheath</u> ……..		
<u>Peripheral strength member</u> - Metallic - Non-metallic ……..	 M-p-m N-m-p-m	
<u>Moisture barrier</u> - Coated aluminium tape - Double coated aluminium tape - Double coated steel tape - Welded steel tape - Welded copper tape ……..	 C-a-t D-c-a-t D-c-s-t W-s-t W-c-t	
<u>Outer sheath</u> ……..		
<u>Additional armouring</u> - Metallic armouring - Non-metallic armouring ……..	 M-a N-m-a	
<u>Additional outer sheath</u> ……..		
<u>Marking identification</u> - Customer requirement - Identification of manufacturer		

(8) Application information:	
Application	
Nominal outer diameter (d)	mm
Minimum bending radius for static bending Minimum bending radius for dynamic bending	mm or nxd mm or nxd
Temperature range :	
- Transport and storage - Installation - Operation	°C °C °C
Manufacturing cable length : - Typical - Nominal/tolerances : according customer requirement	 m m