



**SLOVENSKI STANDARD
SIST EN 187102:1999**

01-maj-1999

Family Specification: Optical aerial telecommunication cables

Family Specification: Optical aerial telecommunication cables

Familienspezifikation: LWL-Fernmelde-Luftkabel

Spécification de famille: Câbles optiques de télécommunication aériens

Ta slovenski standard je istoveten z: EN 187102:1995

[SIST EN 187102:1999](https://standards.iteh.ai/catalog/standards/sist/ee55619c-f559-48b4-8cb4-4928bb47d29/sist-en-187102-1999)

<https://standards.iteh.ai/catalog/standards/sist/ee55619c-f559-48b4-8cb4-4928bb47d29/sist-en-187102-1999>

ICS:

33.180.10 (U) Fibres and cables

SIST EN 187102:1999

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 187102:1999](#)

<https://standards.iteh.ai/catalog/standards/sist/ee55619c-f559-48b4-8cb4-4928bb47d29/sist-en-187102-1999>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 187102

April 1995

Descriptors: Family specification, quality, electronic components, optical telecommunication cables

English version

Family Specification: Optical aerial telecommunication cables

Spécification de famille: Câbles optiques
de télécommunication aériens

Familienpezifikation:
LWL-Fernmelde-Luftkabel

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

[SIST EN 187102:1999](https://standards.iteh.ai/catalog/standards/sist/ee55619c-f559-48b4-8cb4-49278b47d29/sist-en-187102-1999)

This European Standard was approved on 1994-12-28. 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 standard has been produced in accordance with a specialised agreement on work repartition and cooperation for standardisation concerning fibre optics and is part of the CEN/CENELEC/ETSI (European Telecommunications Standards Institute) cooperation agreement.

It complements the Sectional Specification already published as EN 60794-3 (EN 187 100). It uses information provided by the ETSI on functional and system related aspects by means of the Interim European Telecommunications Standards (I-ETS) :

I-ETS 300 229 : Single -mode optical fibre cables to be used in Optical Aerial Telecommunication Cables, prepared by ETSI/TM1/WG1, reviewed and completed by the CECC.

According to the CEN/CENELEC/ETSI cooperation agreement, this standard, in conjunction with EN 60794-3, supersedes the I-ETS document, automatically withdrawn at the date of publication of this standard.

The draft specification prEN 187 102 was submitted to the CECC voting procedure and was approved as EN 187 102 on 28-12-1994.

ITih STANDARD PREVIEW

The following dates were fixed : **(standards.iteh.ai)**

- latest date of publication of an identical national standard (dop) [SIST EN 187102:1999](https://standards.iteh.ai/catalog/standards/sist/en-187102-1999) 1995-09-30
https://standards.iteh.ai/catalog/standards/sist/en-187102-1999/55619c-f559-48b4-8cb4-4928bf647d29/sist-en-187102-1999
- latest date of withdrawal of conflicting national standards (dow) 1996-09-30

Contents

| Clause | Page |
|----------------------------------------------------------------------------------------------------------------------------------------------|------|
| 1 Object | 4 |
| 2. General | 4 |
| 3. Normative references | 5 |
| 4. Symbols..... | 6 |
| 5 Family specification for optical aerial telecommunication cables to be used in (Blank Detail Specification and minimum requirements) | 7 |
| 5.1 Cable description | 7 |
| 5.2 Optical fibres..... | 10 |
| 5.3 Cable element | 11 |
| 5.4 Cable construction | 12 |
| 5.5 Installation and operating conditions | 13 |
| 5.6 Mechanical and environmental tests | 14 |
| 5.6.1 Tests applicable | 14 |
| 5.6.2 Family Requirements and Test Conditions for Optical Fibre Cable Tests | 15 |
| 5.7 Guidance for Preparation of Detail Specifications | 19 |
| 6 Standard European optical aerial telecommunication cables..... | 20 |
| Annex A (Normative) - Tables..... | 22 |

(standards.iteh.ai)

[SIST EN 187102:1999](https://standards.iteh.ai/catalog/standards/sist/ee55619c-f559-48b4-8cb4-4928bfb47d29/sist-en-187102-1999)

<https://standards.iteh.ai/catalog/standards/sist/ee55619c-f559-48b4-8cb4-4928bfb47d29/sist-en-187102-1999>

1. Object

This Family Specification covers Optical Aerial Telecommunication Cables Requirements of the Sectional Specification for Optical Telecommunication Cables are applicable to cables covered by this Standard.

The clause 5 of this Standard describes a Blank Detail Specification for Optical Aerial Telecommunication Cables It incorporates some minimum requirements common to all European Countries.

The clause 6 describes the different options following these minimum requirements accepted as European Standards.

The numerical values for these standard options existing in the different european countries have been provided under their own responsibility by each National Committee. The future updating and amendment of the table of clause 6 will be done on the same way.

Detail Specifications may be prepared based on this Family Specification following in particular requirements of clauses 5 and 6.

2. General

iTeh STANDARD PREVIEW
(standards.iteh.ai)

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 or 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 amendment or revision. For undated references the latest edition of the publication referred to applies.

| | | |
|-------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EN 187000 | 1992 | Generic specification: Optical fibre cables NOTE: EN 187000 largely corresponds to, but is not identical with IEC 794-1. |
| EN 60794-3 (EN 187100) | 1994 | Optical fibre cables - Part 3: Telecommunication cables - Sectional specification |
| EN 188000 | 1993 | Generic specification: Optical fibres NOTE: EN 188000 largely corresponds to, but is not identical with IEC 793-1. |
| EN 188101 | 1995 | Family specification: Single-mode dispersion unshifted (B1.1) optical fibre |
| EN 188102 (in preparation) | - | Family specification: Single-mode dispersion shifted (B2) optical fibre |
| HD 402 S2 | 1984 | Standard colours for insulation for low-frequency cables and wires (IEC 304:1982) |
| HD 505.1.1 S3 | 1991 | Common test methods for insulating and sheathing materials of electric cables - Part 1: Methods for general application - Section 1 (IEC 811-1-1:1985 + A1:1988 + A2:1989) |
| HD 505.4.2 S1 | 1992 | Common test methods for insulating and sheathing materials of electric cables - Part 4: Methods specific to polyethylene and polypropylene compounds - Section 2 (IEC 811-4-2:1990) |
| HD 505.5.1 S1 | 1992 | Common test methods for insulating and sheathing materials of electric cables - Part 5: Methods specific to filling compounds - Section 1 (IEC 811-5-1:1990) |
| HD 624 | series | Materials used in communication cables |
| IEC 708-1 A3 | 1981 1988 | Low-frequency cables with polyolefin insulation and moisture barrier sheath - Part 1: General design details and requirements |

4 . Symbols

For the purposes of this Standard the following symbols apply.

| | |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| λ_{cc} | Cabled fibre cut-off wavelength |
| d | Nominal outer diameter of the cable (for figure 8 cables the value of d is the length of the minor axis). |
| DS | Detail specification |
| T ₀ | Threshold below which no attenuation and/or fibre strain increase should occur in the "Tensile performance 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 performance test". |
| TA1) | |
| TA2) | |
| TB1) | Temperature cycling test temperature limits according to EN 187 000, test method 601. |
| TB2) | |
| t ₁ | Temperature cycling test dwell time. |

[SIST EN 187102:1999
https://standards.iteh.ai/catalog/standards/sist/ee55619c-f559-48b4-8cb4-4928bf47d29/sist-en-187102-1999](https://standards.iteh.ai/catalog/standards/sist/ee55619c-f559-48b4-8cb4-4928bf47d29/sist-en-187102-1999)

5. Family specification for optical aerial telecommunication 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 187 000 Sectional specification : EN 187 100 | |
| (5) Additional references : | | |
| (6) Cable description : | | |
| (7) Cable construction : | | |
| <u>OPTICAL FIBRES</u> | | |
| <u>RANGE OF FIBRE COUNT</u> | | |
| <u>MODULARITY</u> | | |
| <u>CONSTRUCTION</u> | | Additional remarks |
| - Single coloured fibre | S-c-f | |
| - Loose tube - filled | F-l-t | |
| - Loose 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 loose 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 | |
| <u>Lay-up</u> | | |
| - Stranding (helical or SZ) | Str | |
| - Single unit | S-u | |
| - Hybrid configuration | H-c | |
| | | |

| | |
|------------------------------------|---------|
| (7) Cable construction (continued) | |
| <u>Conductors</u> | |
| | |
| <u>Inner Sheath</u> | |
| | |
| <u>Peripheral strength member</u> | |
| - Metallic | M-p-m |
| - Non-metallic | N-m-p-m |
| | |
| <u>Moisture Barrier</u> | |
| - Coated aluminium tape | C-a-t |
| - Double coated aluminium tape | D-c-a-t |
| - Double coated steel tape | D-c-s-t |
| | |
| <u>Outer Sheath</u> | |
| | |
| <u>Additional armouring</u> | |
| - Non-metallic armouring | N-m-a |
| - Metallic armouring | M-a |
| <u>Additional outer sheath</u> | |
| | |
| <u>Figure 8 construction</u> | |
| - Metallic suspension strand | |
| - Non-metallic suspension strand | |
| <u>Marking Identification</u> | |
| - Customer requirement | |
| - Identification of manufacturer | |

STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 187102:1999

<https://standards.iteh.ai/catalog/standards/sist/ee55619c-f559-48b4-8cb4-4928bb47d29/sist-en-187102-1999>

| (8) Application information: | |
|-------------------------------------------------------|-----------------------|
| Application | |
| Nominal outer diameter (d) | mm |
| Minimum bending radius for static bending | mm or nxd |
| Minimum bending radius for dynamic bending | mm or nxd |
| Installation and operating conditions (see 5.5) | |
| Temperature range : | |
| - Transport and storage | °C |
| - Installation (see 5.6.2.10) | °C |
| - Operation | °C |
| Twisting (for figure 8 cable): | 1 turn per .. m cable |
| Nominal span length: | m |
| Nominal installation sag: | m |
| Ice loading: | N/m |
| Wind loading: | N/m |
| Combination of ice and wind loading: | |
| Manufacturing cable length : | |
| - Typical | m |
| - Nominal/tolerances : according customer requirement | m |

5.2 Optical fibres**5.2.1 Single mode dispersion unshifted (B1.1) optical fibre**

| Characteristics (9) | EN 187 100 Clause (10) | Family (11) Requirements | Test Methods (12) | Remarks (13) |
|-----------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------|
| Uncabled Optical fibre | 4.1 | EN 188101 | | |
| Attenuation coefficient (cabled fibres) at 1310 nm at 1550 nm Attenuation discontinuities Attenuation linearity | 4.2 | acc. D.S. typical values: $\leq 0,45$ dB/km $\leq 0,30$ dB/km $\leq 0,10$ dB under considera- tion | EN 188 000 - 301, - 302, - 303 under considera- tion | |
| Cabled fibre cut-off wave-length | 4.3 | $\lambda_{cc} < \lambda_{\text{operational}}$ | EN 188 000 - 313 | |
| Fibre colouring Outer diam. including colouring | 4.4 7.2.1.1 | IEC 304 acc. D.S. | visual inspection EN 188 000 - 104 | |

iTeh STANDARD PREVIEW
(standards.iteh.ai)
<https://standards.iteh.ai/catalog/standards/sist/ee55619c-f559-48b4-8cb4-49286b647d29/sist-en-187102-1999>

5.2.2 Single mode dispersion shifted (B2) optical fibre

| Characteristics (9) | EN 187 100 Clause (10) | Family (11) Requirements | Test Methods (12) | Remarks (13) |
|----------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------|
| Uncabled Optical fibre | 4.1 | EN 188102 | | |
| Attenuation coefficient (cabled fibre) at 1310 nm at 1550 nm Attenuation discontinuities Attenuation linearity | 4.2 | acc. D.S. typical values: $\leq 0,45$ dB/km $\leq 0,30$ dB/km $\leq 0,10$ dB under considera- tion | EN 188 000 - 301, - 302, - 303 under considera- tion | |
| Cabled fibre cut-off wave-length | 4.3 | $\lambda_{cc} < \lambda_{\text{operational}}$ | EN 188 000 - 313 | |
| Fibre colouring Outer diam. including colouring | 4.4 7.2.1.1 | IEC 304 acc. D.S. | visual inspection EN 188 000 - 104 | |