

INTERNATIONAL STANDARD



**Coaxial communication cables –
Part 5: Sectional specification for CATV trunk and distribution cables**

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CONTENTS

FOREWORD	4
1 Scope	6
2 Normative references	6
3 Terms and definitions	8
4 Materials and cable construction	8
4.1 Cable construction	8
4.2 Inner conductor	8
4.2.1 Conductor material	8
4.2.2 Conductor construction	8
4.3 Dielectric	9
4.4 Outer conductor or screen	9
4.5 Filling compounds	9
4.6 Moisture barriers	9
4.7 Wrapping layers	9
4.8 Sheath	9
4.9 Metallic protection	10
4.10 Cable integral suspension strand (messenger wire)	10
4.11 Oversheath	10
4.12 Fauna proofing	10
4.13 Chemical and/or environmental proofing	10
4.14 Cable identification	10
4.14.1 General	10
4.14.2 Sheath marking	10
4.14.3 Labelling	11
4.15 Completed cable	11
4.16 Standard ratings and characteristics	11
6 Identification and marking	11
 6.1 Cable identification	11
 6.2 Cable marking	11
 6.3 Labelling	11
5 Tests for completed cables	11
5.1 General	11
5.2 Electrical testing of the finished cable	12
5.2.1 Low-frequency and DC electrical measurements	12
5.2.2 High-frequency electrical and transmission test procedures and requirements	12
5.3 Environmental test procedures and requirements of the finished cable	14
5.4 Test procedures and requirements of mechanical characteristics of the finished cable	14
5.5 Fire performance	15
6 Quality assessment	16
7 Delivery and storage	16

Annex A (normative) Cable identification and marking	17
A.1 Cable identification	17
A.1.1 Type name	17
A.1.2 Variants	17
A.1.3 Screening classes	18
A.2 Cable marking	18
Annex B (informative) Cable types	19
List of comments	20
Table 1 – Low-frequency and DC test procedures and requirements	12
Table 2 – High-frequency electrical and transmission test procedures and requirements	13
Table 3 – Environmental test procedures and requirements of the finished cable	14
Table 4 – Test procedures and requirements of mechanical characteristics of the finished cable	15
Table 5 – Fire performance requirements	16
Table B.1 – Distribution and trunk cables – Preferred nominal dimensions and ratings	19

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COAXIAL COMMUNICATION CABLES –

**Part 5: Sectional specification for CATV trunk
and distribution cables**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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This commented version (CMV) of the official standard IEC 61196-5:2022 edition 4.0 allows the user to identify the changes made to the previous IEC 61196-5:2018 edition 3.0. Furthermore, comments from IEC SC 46A experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

IEC 61196-5 has been prepared by subcommittee 46A: Coaxial cables, of IEC technical committee 46: Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2018. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Clause 4: complete revision;
- b) Annex A: cable identification and marking has been added;
- c) Annex B: Table B.1, cable types have been added.

The text of this International Standard is based on the following documents:

Draft	Report on voting
46A/1605/FDIS	46A/1610/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

A list of all parts in the IEC 61196 series, published under the general title *Coaxial communication cables*, can be found on the IEC website.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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COAXIAL COMMUNICATION CABLES –

Part 5: Sectional specification for CATV trunk and distribution cables

1 Scope

This part of IEC 61196, which is a sectional specification, applies to coaxial cables for analogue and digital one- and two-way signal transmission, for example for cable networks for television signals, sound signals and interactive services in accordance with IEC 60728-1, IEC 60728-1-1, IEC 60728-101, IEC 60728-10, ISO/IEC 11801-1 and ISO/IEC 11801-4. This includes also the transmission of BCT signals provided by a CATV, MATV or SMATV cable networks.

This document specifies the test procedures and requirements for trunk and distribution cables for temperatures between -40 °C and $+65\text{ °C}$ and in the frequency range of 5 MHz to 2 000 MHz.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60068-1:2013, *Environmental testing – Part 1: General and guidance*

<https://standards.iteh.ai/catalog/standards/sist/723436ea-440f-4e03-98b1-5fed82368331/iec-60068-2-78>, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60096-0-1, *Radio Frequency cables – Part 0-1: Guide to the design of detail specifications – Coaxial cables*

IEC 60728-1, *Cable networks for television signals, sound signals and interactive services – Part 1: System performance of forward paths*

IEC 60811-410, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 410: Miscellaneous tests – Test method for copper-catalyzed oxidative degradation of polyolefin insulated conductors*

IEC 60811-605, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 605: Physical tests – Measurement of carbon black and/or mineral filler in polyethylene compounds*

IEC 61196-1:2005, *Coaxial communication cables – Part 1: Generic specification – General, definitions and requirements*

IEC 61196-1-1, *Coaxial communication cables – Part 1-1: Capability approval for coaxial cables*

IEC 61196-1-101, *Coaxial communication cables – Part 1-101: Electrical test methods – Test for conductor d.c. resistance of cable*

IEC 61196-1-102, *Coaxial communication cables – Part 1-102: Electrical test methods – Test for insulation resistance of cable dielectric*

IEC 61196-1-105, *Coaxial communication cables – Part 1-105: Electrical test methods – Test for withstand voltage of cable dielectric*

IEC 61196-1-106, *Coaxial communication cables – Part 1-106: Electrical test methods – Test for withstand voltage of cable sheath*

IEC 61196-1-108, *Coaxial communication cables – Part 1-108: Electrical test methods – Test for characteristic impedance, phase and group delay, electrical length and propagation velocity*

IEC 61196-1-112, *Coaxial communication cables – Part 1-112: Electrical test methods – Test for return loss (uniformity of impedance)*

IEC 61196-1-113, *Coaxial communication cables – Part 1-113: Electrical test methods – Test for attenuation constant*

IEC 61196-1-115, *Coaxial communication cables – Part 1-115: Electrical test methods – Test for regularity of impedance (pulse/step function return loss)*

IEC 61196-1-201, *Coaxial communication cables – Part 1-201: Environmental test methods – Test for cold bend performance of cable*

IEC 61196-1-203, *Coaxial communication cables – Part 1-203: Environmental test methods – Test for water penetration of cable*

IEC 61196-1-206, *Coaxial communication cables – Part 1-206: Environmental test methods – Climatic sequence*

IEC 61196-1-209, *Coaxial communication cables – Part 1-209: Environmental test methods – Thermal ageing cycling*

IEC 61196-1-212, *Coaxial communication cables – Part 1-212: Environmental test methods – UV stability*

IEC 61196-1-301, *Coaxial communication cables – Part 1-301: Mechanical test methods – Test for ovality*

IEC 61196-1-302, *Coaxial communication cables – Part 1-302: Mechanical test methods – Test for eccentricity*

IEC 61196-1-308, *Coaxial communication cables – Part 1-308: Mechanical test methods – Test for tensile strength and elongation for copper-clad metals*

IEC 61196-1-310, *Coaxial communication cables – Part 1-310: Mechanical test methods – Test for torsion characteristics of copper-clad metals*

IEC 61196-1-313, *Coaxial communication cables – Part 1-313: Mechanical test methods – Adhesion of dielectric and sheath*

IEC 61196-1-314, *Coaxial communication cables – Part 1-314: Mechanical test methods – Test for bending*

IEC 61196-1-316, *Coaxial communication cables – Part 1-316: Mechanical test methods – Test for maximum pulling force of cable*

IEC 61196-1-317, *Coaxial communication cables – Part 1-317: Mechanical test methods – Test for crush resistance of cable*

IEC 61196-1-324, *Coaxial communication cables – Part 1-324: Mechanical test methods – Test for abrasion resistance of cable*

IEC 62153-1-1, *Metallic communication cables test methods – Part 1-1: Electrical – Measurement of the pulse/step return loss in the frequency domain using the Inverse Discrete Fourier Transformation (IDFT)*

IEC 62153-4-3, *Metallic communication cable test methods – Part 4-3: Electromagnetic compatibility (EMC) – Surface transfer impedance – Triaxial method*

IEC 62153-4-4, *Metallic communication cable test methods – Part 4-4: Electromagnetic compatibility (EMC) – Test method for measuring of the screening attenuation as up to and above 3 GHz, triaxial method*

~~EN 50289 4-17, Communication cables – Specifications for test methods – Part 4-17: Test methods for UV resistance evaluation of the sheath of electrical and optical fibre cable⁴~~ **1**

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61196-1 and IEC 60728-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Materials and cable construction

4.1 Cable construction

The cable construction shall be in accordance with 4.2 to 4.6 of this document and the requirements stated in the relevant detail specification.

Table B.1 (Annex B) indicates typical cables and properties, for informative purposes, with copper conductors. **2**

4.2 Inner conductor

4.2.1 Conductor material

IEC 61196-1:2005, 4.4.1 applies. The conductor material shall be as stated in the relevant cable detail specification.

4.2.2 Conductor construction

The conductor shall consist of a single strand or tube.

In addition, IEC 61196-1:2005, 4.4.1 applies.

The centre conductor diameter shall be stated in the relevant detail specification. The tolerance on the centre conductor shall be $\pm 0,03$ mm for conductors with a diameter ≤ 4 mm. For

⁴~~An IEC test procedure for UV stability is under consideration.~~

conductors with a diameter above 4 mm, the tolerance shall be as stated in the detail specification.

4.3 Dielectric

The construction of the dielectric shall be one of the following:

- solid dielectric,
- air-spaced dielectric,
- semi air-spaced dielectric,
- gas-injected cellular polymer dielectric.

Life expectancy of the dielectric is proved by an oxidative induction time (OIT) test before and after ageing in accordance with IEC 60811-410.

4.4 Outer conductor or screen

The type, material, nominal thickness and diameter of the outer conductor or screen shall be specified in the relevant detail specification. The tolerance of the outer conductor shall be $\pm 0,05$ mm for constructions in accordance with IEC 61196-1:2005, 4.6.1 c), excluding corrugated designs. The tolerance for all other constructions, including corrugated designs, shall be $\pm 0,3$ mm in accordance with all other designs noted in IEC 61196-1:2005, 4.6.1.

The construction and material of the outer conductor or screen shall be as stated in the relevant detail specification. The construction shall be in accordance with IEC 61196-1:2005, 4.6.1 c), or IEC 61196-1:2005, 4.6.1 f) or IEC 61196-1:2005, 4.6.1 g).

For constructions with metal foil and/or braid, the braid angle shall be between 15° and 45°. Coverage factor shall be as specified in the detail specification.

4.5 Filling compounds

When required by the relevant specification, a layer between the outer conductor or screen and the cable sheath shall be filled continuously with a compound suitable to prevent water penetration within the cable.

Longitudinal water tightness may be achieved also by other solutions such as swelling powder, yarns, or tapes. **3**

4.6 Moisture barriers

To minimize moisture permeation through the sheath, a longitudinal overlapped metallic tape may be used that is bonded to the inner surface of an extruded plastic sheath. **4**

4.7 Wrapping layers

Not applicable. **5**

4.8 Sheath

IEC 61196-1:2005, 4.7 applies with the following amendments and additions:

Cables without an outer sheath shall not be subject to 4.5 of this document. **6**

The outer sheath of the cable shall be a thermoplastic material as specified in the relevant detail specification.

The nominal sheath thickness shall be as stated in the relevant detail specification. **4**

The nominal diameter of the sheath shall be as stated in the relevant detail specification.

The maximum allowable tolerance of the diameter shall be as stated in the relevant detail specification.

The maximum allowable values for ovality and eccentricity are given in Table 4 of this document.

For aerial cables or cables for outdoor use with a black polyethylene sheath, the carbon black content shall be as specified in Table 4.

For other sheath material and colours of cables for outdoor use, the cable shall pass the UV stability test ~~according to EN 50289-4-17~~ in accordance with IEC 61196-1-212. **7**

The messenger type shall be specified in the relevant detail specification and shall include as a minimum the following criteria: type and material, tensile strength, corrosion properties and elongation.

4.9 Metallic protection **8**

When applicable, metallic protection shall meet the requirements of the relevant detail specification

4.10 Cable integral suspension strand (messenger wire)

When applicable, messenger wires shall meet the requirements of the relevant detail specification.

4.11 Oversheath

When applicable, oversheaths shall meet the requirements of the relevant detail specification

4.12 Fauna proofing

When applicable, fauna proofing shall meet the requirements of the relevant detail specification.

4.13 Chemical and/or environmental proofing

Not applicable. **9**

4.14 Cable identification **10**

4.14.1 General

IEC 61196-1:2005, 6.1 applies

4.14.2 Sheath marking

Unless otherwise specified in the detail specification, sheath marking shall be achieved as a non-degradable print containing the minimum information:

- a number giving the nominal characteristic impedance of the cable in ohms, for example "75",
- a number that corresponds to the approximate dielectric outer diameter in mm, for example, the nominal dielectric diameter 3,66 mm shall be expressed by "4",
- a letter that corresponds to the different outer conductor construction types,
- a letter that corresponds to the different inner conductor types,

- a letter that corresponds to the different outer conductor construction types,
- letters that correspond to the different outer conductor materials,
- a number that corresponds to the different screening classes,
- the number of the IEC standard (61196-7),
- the name of the supplier,
- the length of cable.

EXAMPLE: 75-4T-BC-ALT/BC/ALT-A – <xxx> – IEC 61196-5

More detailed information is given in Annex A.

4.14.3 Labelling

Unless otherwise specified in the detail specification, drums or coils shall be provided with a label with non-degradable print containing the minimum information given in A.1.1.

4.15 Completed cable

The nominal dimensions and tolerances shall be stated in the detail specification. ~~Preferred nominal dimensions and ratings are given in Annex A, Table A.1.~~

4.16 Standard ratings and characteristics

The ratings and characteristics applicable to each cable shall be specified herein or in the relevant detail specification.

6 Identification and marking 11

6.1 Cable identification

~~Subclause 6.1 of IEC 61196-1:2005 applies.~~

6.2 Cable marking

~~The cable marking shall be applied to the sheath or to the outer conductor when a sheath is not present. The marking shall consist of the IEC cable type number as given in 6.1.1 of IEC 61196-1:2005 and/or the manufacturer's designated markings when specified in the relevant cable specification.~~

6.3 Labelling

~~Labelling shall be provided in accordance with 6.3 of IEC 61196-1:2005 and the relevant detail specification.~~

5 Tests for completed cables

5.1 General

When tested in accordance with the IEC 61196-1 series, the requirements of 5.2 to 5.5 shall apply.

Unless otherwise specified, all measurements shall be carried out under standard atmospheric conditions for testing in accordance with IEC 60068-1:2013/2012, Clause 5.

Applicable test methods shall be in accordance with the IEC 61196-1-100 series, the IEC 61196-1-200 series, the IEC 61196-1-300 series, and the IEC 62153 series.