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Coaxial communication cables –
Part 11: Sectional specification for semi-rigid cables with polyethylene (PE)
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IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COAXIAL COMMUNICATION CABLES –

**Part 11: Sectional specification for semi-rigid cables
with polyethylene (PE) dielectric**

FOREWORD

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IEC 61196-6 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 second edition cancels and replaces the first edition published in 2016. This edition constitutes a technical revision.

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

- a) Clause 1: The scope is more detailed.
- b) Subclause 4.2: Outer diameter ratings of the inner conductor recommended.
- c) Subclause 4.3: Dielectric: outer diameter ratings of the dielectric recommended.
- d) Clause 5: IEC type designation introduced.
- e) Clause 7: Standard ratings and characteristics: completely revised.

f) Clause 8: Requirements of finished cables: completely revised.

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

Draft	Report on voting
46A/1554/FDIS	46A/1559/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.

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/standardsdev/publications.

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

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 11: Sectional specification for semi-rigid cables with polyethylene (PE) dielectric

1 Scope

This part of IEC 61196 specifies the general requirements of semi-rigid coaxial communication cables with polyethylene (PE) dielectric, including material and construction, IEC type designation, identification, marking and labelling, standard ratings and characteristics, requirements of finished cables, quality assessment, delivery and storage, etc.

This part of IEC 61196 applies to semi-rigid coaxial communication cables with polyethylene (PE) dielectric and tubular outer conductor. These cables are widely used in the interconnection between wireless communication equipment and antenna, as well as RF and microwave electronic equipment, broadcast television, microwave relay, navigation, etc.

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*

IEC 60332-1-2, *Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame*

IEC 60754-1, *Test on gases evolved during combustion of materials from cables – Part 1: Determination of the halogen acid gas content*

IEC 60811-406, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 406: Miscellaneous tests – Resistance to stress cracking of polyethylene and polypropylene compounds*

IEC 60811-502, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 502: Mechanical tests – Shrinkage test for insulations*

IEC 61034-2, *Measurement of smoke density of cables burning under defined conditions – Part 2: Test procedure and requirements*

IEC 61169-4, *Radio-frequency connectors – Part 4: RF coaxial connectors with inner diameter of outer conductor 16 mm (0,63 in) with screw lock – Characteristic impedance 50 Ω (type 7-16)*

IEC 61196-1 (all parts), *Coaxial communication cables – Part 1: Electrical test methods*

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 61196-1-103, *Coaxial communication cables – Part 1-103: Electrical test methods – Test for capacitance of cable*

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 61196-1-110, *Coaxial communication cables – Part 1-110: Electrical test methods – Test for continuity*

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 61196-1-201:2009, *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 61196-1-215, *Coaxial communication cables – Part 1-215: Environmental test methods – High temperature cable ageing*

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 61196-1-313, *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 62037-4, *Passive RF and microwave devices, intermodulation level measurement – Part 4: Measurement of passive intermodulation in coaxial cables*

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*

IEC 62230, *Electric cables – Spark-test 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 cable*

3 Terms and definitions

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

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

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

4 Materials and cable construction

4.1 Cable construction

Semi-rigid coaxial communication cables with polyethylene (PE) dielectric are composed of inner conductor, insulation, outer conductor and sheath.

4.2 Inner conductor

IEC 61196-1:2005, Subclause 4.4.1 applies.

The material of the inner conductor shall be as stated in the detail specification.

The conductor shall consist of a solid or stranded wire or corrugated or smooth tube or rifled tube.

In addition, IEC 61196-1:2005, Subclause 4.4.4 applies.

The inner conductor diameter shall be stated in the detail specification.

For the corrugated inner conductor, the peak diameter, root diameter and pitch shall be specified in the detail specification.

The tolerance of the inner conductor shall be specified in the detail specification.

The recommended outer diameter ratings of the inner conductor are as follows:

1,9 mm (1/4"), 3,55 mm (1/2"), 4,8 mm (1/2"), 9,00 mm (7/8"), 13,1 mm (1-1/4") or as specified in the detail specification.

4.3 Dielectric

The material of the dielectric shall be polyethylene (PE).

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

- solid dielectric,
- air spaced dielectric,
- semi air spaced dielectric (e.g. cellular polyethylene dielectric).

The recommended outer diameter ratings of the dielectric (the rounded value of the approximate outer diameter of the dielectric) are as follows:

5 mm (1/4"), 9 mm (1/2"), 12 mm (1/2"), 22 mm (7/8"), 32 mm (1-1/4") or as specified in the detail specification.

The diameter and tolerance shall be specified in the detail specification.

For cables with corrugated outer conductor, the nominal diameter of the dielectric shall be specified in the detail specification.

For cables with smooth tube outer conductor, the diameter and tolerance of the dielectric shall be stated in the detail specification.

4.4 Outer conductor

The material of the outer conductor shall be copper tube or aluminium tube or as stated in the detail specification.

The conductor shall consist of a corrugated or smooth tube.

In addition, the requirements of IEC 61196-1:2005, 4.6.1 apply.

The diameter and thickness of the outer conductor shall be specified in the detail specification.

For corrugated outer conductors, the peak diameter, root diameter and pitch shall be as specified in the detail specification.

The tolerance on the outer conductor shall be specified in the detail specification.

4.5 Sheath

The sheath of a cable shall be in accordance with IEC 61196-1:2005, 4.7 with the following amendments and additions:

- a) The material of the cable sheath shall be specified in the detail specification.
- b) The diameter and minimum thickness and tolerance of the sheath shall be as stated in the detail specification.
- c) For cables intended for outdoor applications or exposed to sunlight, the cable shall pass the UV stability test according to EN 50289-4-17; an IEC test procedure is under consideration.

d) For some special applications, a sheath is not needed.

5 IEC type designation

5.1 Type name

The type name of the cable includes the nominal characteristic impedance and dielectric outer diameter rating, expressed as follows:

- a) The nominal characteristic impedance in ohms, such as 50.
- b) The outer diameter ratings of the dielectric in mm, when needed, the outer diameter ratings of the dielectric in inches may be given in brackets; see Subclause 4.3.

For example: 50-5(1/4") is a cable, its nominal characteristic impedance is 50 Ω and its outer diameter rating of dielectric is 5 mm (1/4 in).

5.2 Variant

The variant of the cable includes sheath material, outer conductor material and its structure, expressed as follows:

- a) Sheath material

PE–Polyethylene

LSZH–Low smoke zero halogen polyolefin

- b) Outer conductor material and its structure

CT–Smooth copper tube

ALT–Smooth aluminium tube

H–Helically corrugated copper tube

A–Annular corrugated copper tube

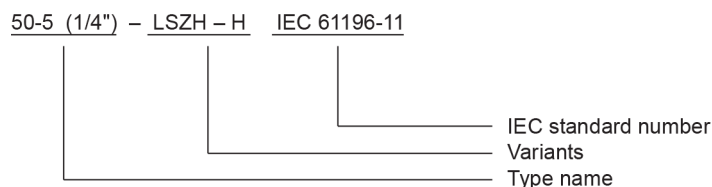
HL–Helically corrugated aluminium tube

AL–Annular corrugated aluminium tube

For example: 50-5(1/4")-PE-CT, PE-CT is one variant of type 50-5(1/4") cable, its sheath material is PE and its outer conductor is smooth copper tube.

5.3 Cable marking

The cable marking consists of cable type, variants and IEC standard number, expressed as follows:



IEC

For example: 50-5(1/4")-LSZH-H IEC 61196-11 indicates a cable, its characteristic impedance is 50 Ω , its approximate diameter of dielectric is 5 mm (1/4"), its sheath is LSZH, and its outer conductor structure and material is helically corrugated copper tube, it complies with IEC 61196-11.