

INTERNATIONAL STANDARD

**Coaxial communication cables –
Part 13: Sectional specification for semi-rigid cables with silicon dioxide
dielectric**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COAXIAL COMMUNICATION CABLES –

**Part 13: Sectional specification for semi-rigid cables
with silicon dioxide dielectric**

FOREWORD

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IEC 61196-13 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.

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

Draft	Report on voting
46A/1623/CDV	46A/1637/RVC

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/publications.

This document is to be read in conjunction with IEC 61196-1:2005.

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- withdrawn, or
- revised.

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COAXIAL COMMUNICATION CABLES –

Part 13: Sectional specification for semi-rigid cables with silicon dioxide dielectric

1 Scope

This part of IEC 61196 specifies the materials and cable construction for semi-rigid coaxial communication cables with silicon dioxide dielectric, IEC type designation, identification, marking and labelling, standard rating 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 silicon dioxide dielectric and tubular outer conductor. These cables are intended for use in applications requiring extreme environments as well as in nuclear power plants, oil rigs and aircraft engines.

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/037bd584-3a26-430e-b72d-7b6ec32c52cb/iec-60068-3-4>, *Environmental testing – Part 3-4: Supporting documentation and guidance – Damp heat tests*

IEC 60793-1-54, *Optical fibres – Part 1-54: Measurement methods and test procedures – Gamma irradiation*

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 61196-1-108, *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 61196-1-111, *Coaxial communication cables – Part 1-111: Electrical test methods – Stability of phase test methods*

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 61196-1-116, *Coaxial communication cables – Part 1-116: Electrical test methods – Test for impedance with time domain reflectometry (TDR)*

IEC 61196-1-119, *Coaxial communication cables – Part 1-119: Electrical test methods – RF average power rating*

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 61196-1-305, *Coaxial communication cables – Part 1-305: Mechanical test methods – Solderability and resistance to soldering*

IEC 61196-1-314:2015, *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 of maximum pulling force of cable*

IEC 61196-1-318, *Coaxial communication cables – Part 1-318: Mechanical test methods – Heat performance tests*

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*

3 Terms and definitions

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

ISO and IEC maintain terminology 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>

3.1

semi-rigid coaxial communication cable

coaxial line with smooth or corrugated tube outer conductor, not intended to be bent or flexed in service or not intended to be flexed after initial forming

4 Materials and cable construction

4.1 General

The cable construction is composed of inner conductor, insulation, outer conductor and sheath.

4.2 Inner conductor

4.2.1 Conductor material

IEC 61196-1:2005, 4.4.1 applies.

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

4.2.2 Conductor construction

The conductor shall consist of a solid wire.

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

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

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

4.3 Dielectric

The dielectric shall be one of the following:

- foamed silica;
- any other structure forms of silicon dioxide materials as stated in the relevant detail specification.

4.4 Outer conductor

The outer conductor shall be a copper or other metal material smooth tube with or without coating or as stated in the relevant cable detail specification.

The coating material and thickness, if any, shall be stated in the relevant detail specification.

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

For cables with smooth tube outer conductor, the diameter and tolerance shall be stated in the detail specification. The recommended outer diameter ratings of outer conductor (approximate the rounded value) are as follows:

1 mm (0,047"), 2 mm (0,086"), 3,5 mm (0,141"), 7 mm (0,275") or as specified in the detail specification.

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

4.5 Sheath (when applicable)

When applicable, the sheath of the cable shall be in accordance with the following requirements.

- a) The material of the cable sheath shall be stainless steel or as specified in the detail specification.
- b) Diameter and minimum thickness and tolerance of the sheath shall be as stated in the detail specification.

5 Type name and identification of cable

5.1 Type

The type name of the cable consists of the nominal characteristic impedance and the outer diameter rating of the outer conductor. The specific names are as follows:

- a) The nominal characteristic impedance, giving the nominal characteristic impedance of the cable in ohms, e.g. 50.
- b) The outer diameter ratings (the approximate outer diameter) of the outer conductor in mm; when needed, the outer diameter ratings of the outer conductor in inches can be given in brackets.

E.g. 50-3,5 (0,141") is the cable type with nominal characteristic impedance of 50 Ω and the outer diameter rating of outer conductor is 3,58 mm (0,141").

5.2 Variants

The variant of cables shall be identified by the following:

- a) Type name.
- b) Inner conductor material:
 - SC – Smooth copper wire;
 - P – Platinum wire.

E.g. 50-3,5 (0,141")-SC is one variant of type 50-3,5 (0,141") cable, and its inner conductor is smooth copper wire.

5.3 Cable marking

The cable marking consists of cable type name, variants and IEC standard number, as shown in Figure 1.

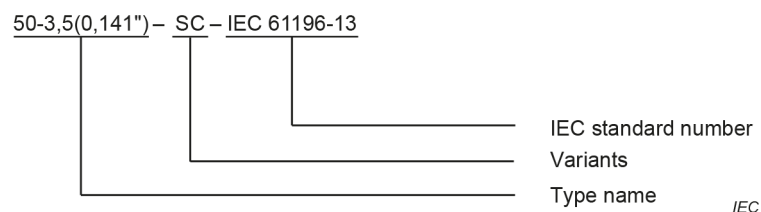


Figure 1 – Cable marking

E.g. 50-3,5(0,141")-SC-IEC 61196-13 indicates a cable, its characteristic impedance is 50 Ω , the outer diameter rating of outer conductor is 3,5 mm (0,141"), and its inner conductor is a smooth copper wire; it complies with IEC 61196-13.

Cable marking shall be applied as an interval separated by a hyphen.

6 Identification, marking and labelling

6.1 Cable identification

IEC 61196-1:2005, 6.1 applies.

6.2 Cable marking (when required)

The cable marking shall be specified in the detail specification.

6.3 Labelling

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

7 Standard rating and characteristics

7.1 Nominal characteristic impedance

The nominal characteristic impedance shall be 50 Ω or as specified in the detail specification.

7.2 Rated temperature and humidity range

The rated temperature and humidity range shall be as specified in Table 1 or specified in the detail specification.

Table 1 – Rated temperature and humidity

Parameter	No sheath		304/316L stainless steel sheath	
	Temperature °C	Relative humidity %	Temperature °C	Relative humidity %
Operational temperature range	-273 to +800	For further study	-273 to +1 000	For further study
Storage temperature range	-55 to +110	For further study	-55 to +110	For further study
Installation temperature range	-10 to +40	For further study	-10 to +40	For further study

7.3 Operating frequency

The operating frequency range is specified in the detailed specification. For the maximum operating frequency of typical cables, see Annex A.

7.4 Average and peak power

Average and peak power shall be specified in the detail specification.

7.5 Bending radius

The minimum bending radius shall be specified in the detail specification. For the minimum bending radius of typical cables, see Annex A.