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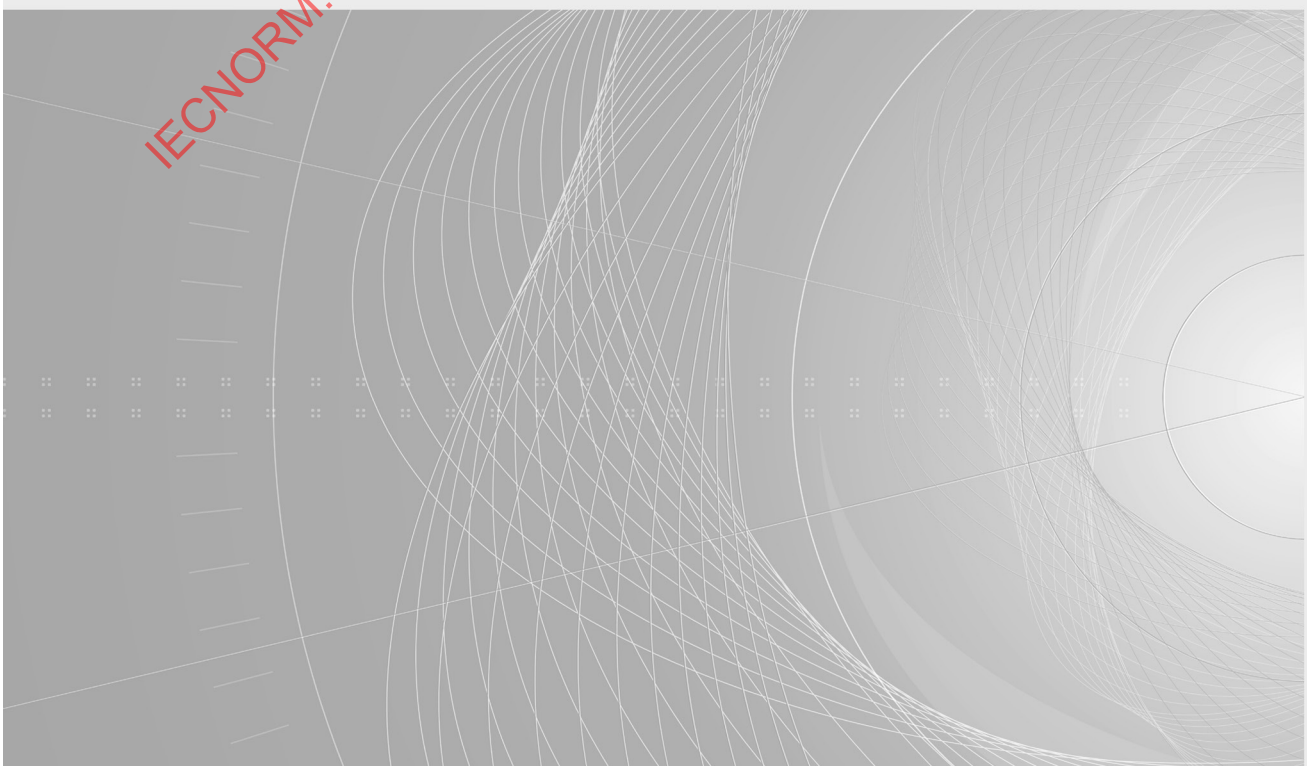
INTERNATIONAL STANDARD

Coaxial communication cables –
Part 13-1: Blank detail specification for semi-rigid cables with silicon dioxide dielectric



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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COAXIAL COMMUNICATION CABLES –

Part 13-1: Blank detail specification for semi-rigid cables with silicon dioxide dielectric

FOREWORD

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IEC 61196-13-1 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/1662/FDIS	46A/1671/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/publications.

This document is to be read in conjunction with IEC 61196-1:2005 and IEC 61196-13:2023.

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.

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- withdrawn, or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.

COAXIAL COMMUNICATION CABLES –

Part 13-1: Blank detail specification for semi-rigid cables with silicon dioxide dielectric

1 Scope

This part of IEC 61196 applies to coaxial communication cables described in IEC 61196-13. It specifies the requirements of semi-rigid coaxial communication cables with silicon dioxide dielectric and tubular outer conductor. These cables are intended for use in applications demanding the extreme environments as well as the nuclear power plant, oil rig and aircraft engine.

This document determines the layout and style for detail specifications. Detail specifications (DS) can be prepared by a national organization, a manufacturer or a user by entering the details in the blank detail specification.

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

IEC 61196-13:2023, *Coaxial communication cables – Part 13: Sectional specification for semi-rigid cables with silicon dioxide dielectric*

3 Terms and definitions

No terms and definitions are listed in this document.

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

4 Guidance for the preparation of detail specifications

The detail specification shall be written in accordance with the layout of the blank detail specification, which forms part of this document.

When a characteristic does not apply, then NA (not applicable) should be entered in the appropriate space.

When a characteristic applies but a specific value is not considered necessary, then NS (not specified) should be entered in the appropriate space.

The numbers shown in brackets in this and the following pages correspond to the following items of required information, which should be entered in the space provided.

[1] Name and address of the organization that has prepared the document.

[2] IEC document number and date of issue.

[3] Address of the organization from which the document is available.

[4] Related documents.

[5] Any other references to the cable, national reference, trade name, etc.

[6] Complete description of the cable.

[7] Cable construction.

[8] Engineering information.

[9] Parameter or characteristic of the cable.

[10] Reference to the relevant subclause of the sectional specification.

[11] Minimum requirements, the values entered shall meet as a minimum the requirements of the sectional specification.

[12] Remarks.

5 Blank detail specification

Title		
[1] Prepared by:	**[2] Document No.:** **Issue:** **Date:**	
[3] Available from:	**[4] Generic specification** **Sectional specification**	IEC 61196-1 IEC 61196-13
[5] Additional references: References to the different test procedures of Column 9 are given in IEC 61196-13.		
[6] Cable description: a) Cable variant b) Material and construction of inner conductor c) Material of dielectric d) Material of outer conductor e) Material of sheath (if any)		
[7] Cable construction **a) Inner conductor** Material: Construction: Diameter (mm) nominal: Tolerance (mm): ± ... **b) Dielectric** Material: Diameter (mm) nominal: Tolerance (mm) tube: ±... **c) Outer conductor** Material: Diameter (mm) nominal: Tolerance (mm): ± ... **d) Sheath (if any)** Material Minimum thickness (mm) Diameter (mm) Tolerance (mm): ± ...		
[8] Engineering information (reference only) a) Operating temperature range, storage temperature range, installation temperature range: b) Maximum recommended operating frequency, cut-off frequency: c) Nominal characteristic impedance: d) Maximum continue working voltage: e) Minimum bending radius (static state): f) Nominal weight: g) Maximum tensile force: h) RF peak power (when required):		

[9] Parameter	[10] IEC 61196-13:2023 Subclause	[11] Value	[12] Remarks
Electrical characteristics	**8.2**		
Inner conductor DC resistance	8.2.1	≤ … Ω/km	
Insulation resistance	8.2.2	≥ 10^4 MΩ·km	
Capacitance	8.2.3	≤ … pF/m	The value of typical cable, see IEC 61196-13:2023, Annex A.
Withstand voltage of dielectric	8.2.4	… kV RMS	40 Hz to 60 Hz
Propagation velocity [a]	8.2.5	≥ 70 % at …°C	The value of typical cable, see IEC 61196-13:2023, Annex A.
Continuity	8.2.6	Inner conductor shall be continuous. Outer conductor shall be continuous.	
Phase stability vs Temperature	8.2.7	≤ … PPM[1] Frequency: … GHz Test temperature: … °C	A graph should be utilized to depict phase versus temperature change.
Return loss	8.2.8	… MHz ~ … MHz ≥ … dB at … °C	Specimen length: ≥ 2 m
Attenuation constant	8.2.9	… MHz ≤ … dB/m at 20 °C	The test method of attenuation for the cable under extreme temperature is for further study, and the value of it can be determined between the manufacturer and the user.
Characteristic impedance	8.2.10	(… ∓ …) Ω at …°C	The typical values are 50 Ω.
RF average power [a]	8.2.11	… W at …°C Frequency: … GHz	The characteristic values should not exceed the range of design values specified in the detail specification.
Screening attenuation [b]	8.2.12	≥ 110 dB, or specified in the detailed specification.	100 MHz to 3 000 MHz
Environmental characteristics	**8.3**		
Heat behaviour	8.3.1	After the test, the attenuation and return loss changes shall be in accordance with the relevant detail specification.	Sample preparation: both ends of the specimen should be attached with suitable RF connectors. Temperature of the heating shall be 1 000 °C or specified in the detail specification.
Damp heat	8.3.2	The attenuation change shall be in accordance with the relevant detail specification.	Sample preparation: both ends of the specimen should be attached with suitable RF connectors. Relative humidity: 90 % to 95 % Temperature: 25 °C
Gamma irradiation [a]	8.3.3	The attenuation change shall be in accordance with the relevant detail specification.	

1 PPM stands for parts per million.

[9] Parameter	[10] IEC 61196-13:2023 Subclause	[11] Value	[12] Remarks
Thermal shock	8.3.4	a) The return loss shall be in accordance with the detail specification b) The attenuation change shall be in accordance with the detail specification c) No cracks, flaws or other damage on the cable surface	Length of sample: ... m Low temperature: ... °C ± ... °C High temperature: ...°C ± ... °C Duration: see IEC 61196-13: 2023, Annex C or as specified in the detail specification. Cycles: 5 or as specified in the detail specification.
Mechanical characteristics	**8.4**		
Visual examination	8.4.1	The sheath or outer conductor (when the cable is without sheath) shall be free of rust or cracks.	
Dimensional examination	8.4.2	The requirement shall be specified in the detailed specification.	
Ovality of inner conductor [b]	8.4.3	≤ ... %	
Ovality of sheath [b, c]	8.4.4	≤ ... %	
Eccentricity of dielectric [b]	8.4.5	≤ ... %	
Solderability	8.4.6	The surface of tubular outer conductor corresponding to the immersed length shall be correctly tinned.	
Cable bending	8.4.7	a) The attenuation change shall be in accordance with the relevant detail specification. b) The return loss shall be in accordance with the relevant detail specification. c) No physical damage on the cable surface.	Bending radius should be in accordance with the relevant detail specification.
Tensile strength of cable (longitudinal pull) [a]	8.4.8	a) The characteristic impedance: (... ± ...) Ω b) No physical damage on the cable surface.	The maximum tension applied shall be greater than or equal to the cable weight of 100 m or be specified in the detail specification.

[a] When required.

[b] When applicable.

[c] Frequencies are not always fixed frequencies and can be a swept over a range.