

INTERNATIONAL STANDARD

**Coaxial communication cables –
Part 8-1: Blank detail specification for semi-flexible cables with fluoropolymer
dielectric**

IECNORM.COM : Click to view the full PDF of IEC 61196-8-1:2023



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2023 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

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

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IECNORM.COM : Click to view the full text of IEC 61196-81:2023

INTERNATIONAL STANDARD

**Coaxial communication cables –
Part 8-1: Blank detail specification for semi-flexible cables with fluoropolymer
dielectric**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.120.10

ISBN 978-2-8322-7620-4

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD	3
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Guidance for the preparation of detail specifications	6
5 Detail specification	7

IECNORM.COM : Click to view the full PDF of IEC 61196-8-1:2023

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COAXIAL COMMUNICATION CABLES –

**Part 8-1: Blank detail specification for semi-flexible cables
with fluoropolymer dielectric**

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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 61196-8-1 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.

This second edition cancels and replaces the first edition published in 2012. This edition constitutes a technical revision.

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

- a) title changed to "Coaxial communication cables – Part 8: Blank detail specification for semi-flexible cables with fluoropolymer dielectric";

- b) new requirements added in Clause 7;
- c) "mean characteristic impedance" (see IEC 61196-8:2012, 7.1.5) changed to "Characteristic impedance";
- d) Subclause 7.1.6 (see IEC 61196-8:2012) deleted.

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

Draft	Report on voting
46A/1640/FDIS	46A/1646/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 61196-8:2023.

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

COAXIAL COMMUNICATION CABLES –

Part 8-1: Blank detail specification for semi-flexible cables with fluoropolymer dielectric

1 Scope

This part of IEC 61196 applies to coaxial communication cables described in IEC 61196-8. It specifies the requirements of semi-flexible coaxial communication cables with fluoropolymer dielectric and tin soaked copper wire braid outer conductor. These cables are intended for use in mobile communication base station antenna systems, terrestrial microwave communication, radar systems and wireless equipment or other signal transmission equipment or units.

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

IEC 61196-8:2023, *Coaxial communication cables – Part 8: Sectional specification for semi-flexible cables with fluoropolymer dielectric*

IEC 61196-10:2022, *Coaxial communication cables – Part 10: Sectional specification for semi-rigid cables with fluoropolymer 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.
- [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.

IECNORM.COM : Click to view the full PDF of IEC 61196-8-1:2023

5 Detail specification

Title:	
[1] Prepared by:	[2] Document No.: Issue: Date:
[3] Available from:	[4] Generic specification IEC 61196-1 Sectional specification IEC 61196-8
[5] Additional references:	
[6] Cable description: a) Cable variant b) Material of inner conductor c) Material and construction of dielectric d) Outer conductor e) Material of sheath (if any)	
[7] Cable construction a) Inner conductor - Material: - Diameter (mm) nominal: - Tolerance (mm): $\pm \dots$ b) Dielectric - Material: - Construction: - Diameter (mm) nominal: - Tolerance (mm): $\pm \dots$ c) Outer conductor - Material: - Construction: - Diameter (mm) nominal: - Tolerance (mm): $\pm \dots$ d) Sheath (if any) - Material: - Minimum thickness (mm): - Diameter (mm) nominal: - Tolerance (mm): $\pm \dots$	
[8] Engineering information (reference only) a) Operation, storage and installation temperature range: b) Maximum recommended operating frequency, cut-off frequency: c) Nominal characteristic impedance: d) Relative propagation velocity (velocity ratio): e) Maximum continue working voltage: f) Minimum bending radius (static state): g) Minimum bending radius (dynamic state): h) Nominal weight: i) Capacitance: j) Maximum tensile force (when required): k) Average power (when required): l) Peak power (when required):	

[9] Parameter	[10] IEC 61196- 8:2023 Subclause	[11] Value	[12] Remarks
Electrical characteristics	7.2		
Continuity	7.2.1	Inner conductor shall be continuous. Outer conductor shall be continuous.	
Conductor direct current resistance	7.2.2	$\leq \dots \Omega/\text{km}$ (inner conductor) $\leq \dots / \text{km}$ (outer conductor)	
Capacitance	7.2.3	$\leq \dots \text{pF/m}$	
Withstand voltage of dielectric	7.2.4	$\dots \text{kV RMS}$	40 Hz ~ 60 Hz
Withstand voltage of sheath (or spark test) ^a	7.2.5	$\dots \text{kV RMS}$	40 Hz ~ 60 Hz
Characteristic impedance	7.2.6	$(\dots \pm \dots) \Omega$	
Insulation resistance	7.2.7	$\geq 10^4 \text{ M}\Omega \cdot \text{km}$	
Propagation velocity ^b	7.2.8	$\geq \dots\%$ or $\dots\% \pm \dots\%$	
Return loss	7.2.9	$\dots \text{MHz}$ to MHz $\geq \dots \text{dB}$	Sample length: $\geq 2 \text{ m}$
Attenuation constant	7.2.10	$\dots \text{MHz} \leq \dots \text{dB/m}$ at 20°C	
Passive intermodulation ^{b c}	7.2.11	Better than -158 dBc	This test is only applicable to cables with characteristic impedance of 50Ω . Both ends of the sample should be attached with type 7-16 connectors (according to IEC 61169-4). Input power: $2 \times 20 \text{ W}$ Test frequency: $\dots \text{MHz}$
Screening attenuation ^b	7.2.12	Better than 100 dB , or as specified in the detailed specification	$0,5 \text{ GHz} \sim 3 \text{ GHz}$
Phase stability vs temperature ^c	7.2.13	$\leq \dots \text{PPM}$ (parts per million) Frequency: $\dots \text{GHz}$ Test temperature:	
Phase stability vs bending ^c	7.2.14	$\pm \dots^\circ$ ($\dots \text{GHz}$ to $\dots \text{GHz}$) Mandrel diameter: $\dots \text{mm}$	
Phase difference ^b	7.2.15	$\pm \dots^\circ$ or $(\dots \pm \dots)^\circ$ Sample length: $(\dots \pm \dots) \text{mm}$ Frequency: $\dots \text{GHz}$	
Corona extinction voltage ^b	7.2.16	$\geq \dots \text{kV}$	
RF power ^b	7.2.17	$\dots \text{W}$ Frequency: $\dots \text{GHz}$	

[9] Parameter	[10] IEC 61196- 8:2023 Subclause	[11] Value	[12] Remarks
Environmental characteristics	7.3		
Cold bend performance	7.3.1	No cracks, flaws or other damage in the cable surface	Test temperature: ...°C ± ...°C Mandrel diameter: ...mm
Resistance to soldering	7.3.2	Displacement: ≤ ...mm	Bending radius: ...mm
Ageing ^b	7.3.3	Displacement: ≤ ...mm No cracks, flaws or other damage in the cable surface	Length of sample: ...m Test temperature: ...°C ± ...°C Duration: 168 h
Stress-crack resistance ^d	7.3.4	No cracks, flaws or other damage in the cable surface	Mandrel diameter: ...mm
Thermal shock ^b	7.3.5	a) Displacement of the dielectric: ≤ ...mm b) No cracks, flaws or other damage in the cable surface	Length of sample: ...m Low temperature: ...°C ± ...°C High temperature: ...°C ± ...°C Duration time: see IEC 61196-10:2022, Annex B or as specified in the detail specification. Cycles: 5 or as specified in the detail specification.
Damp heat (steady state) ^b	7.3.6	No cracks, flaws or other damage in the cable surface	Length of sample: ...m Test temperature: ...°C ± ...°C Relative humidity: ...% RH ± ...% RH Duration time: ... h or ... days
Mechanical characteristics	7.4		
Visual examination	7.4.1	No cracks, splits, irregularities, and imbedded foreign material in the sheath No black spots or cracking in the outer conductor	
Dimensional examination	7.4.2	The requirement shall be specified in the detailed specification.	
Ovality of dielectric	7.4.3	≤ ...%	
Eccentricity of dielectric	7.4.4	≤ ...%	
Ovality of sheath ^a	7.4.5	≤ ...%	
Adhesion of dielectric	7.4.6	≥ ...N to ≤ ...N	Test temperature: 20 °C ± 5 °C Sample length: $L = 50$ mm
Bending	7.4.7	a) Impedance: ...Ω ± ...Ω b) No physical damage in cable surface	Procedure: Bending radius: ... mm
Repeated bending	7.4.8	a) Impedance: ...Ω ± ...Ω b) No physical damage in cable surface	Number of cycles: Mass of the weight: ...kg Bending radius: ... mm
Tensile strength of cable (longitudinal pull) ^b	7.4.9	a) Impedance: ...Ω ± ...Ω b) No physical damage in cable surface	The maximum tension applied shall be greater than the cable weight of 100 m or be specified in the detail specification.