

# INTERNATIONAL STANDARD



**Coaxial communication cables –  
Part 4-1: Blank detail specification for radiating cables**

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IEC 61196-4-1

Edition 2.0 2022-09  
REDLINE VERSION

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**Coaxial communication cables –  
Part 4-1: Blank detail specification for radiating cables**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 33.120.10

ISBN 978-2-8322-5712-8

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## COAXIAL COMMUNICATION CABLES –

## Part 4-1: Blank detail specification for radiating 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 redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 61196-4-1:2016. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.**

IEC 61196-4-1 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 2016. This edition constitutes a technical revision.

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

- a) rewrote "1 Scope" to be consistent with other blank detail specifications of coaxial cables;
- b) added detail construction requirements of inner and outer conductor in "[7] Cable construction";
- c) added "Storage temperature range", "Installation temperature range" and "Stop frequency band" in "[8] Engineering information (reference only)";
- d) added "8.2.11 Link loss", "8.4.9 Adhesion of dielectric", "8.4.10 Shrinkage for insulations", "8.4.11 Maximum pulling force of cable";
- e) added different detail requirements or typical values in 8.2.4, 8.2.6 to 8.2.8, 8.3.1 to 8.3.4, 8.4.1, 8.4.3 to 8.4.8;
- f) deleted "7.4.4 Ovality of outer conductor".

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

Draft	Report on voting
46A/1584/FDIS	46A/1599/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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

This part of IEC 61196 is to be read in conjunction with IEC 61196-1:2005 and IEC 61196-4:—1.

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.

<sup>1</sup> Under preparation. Stage at the time of publication: IEC 61196-4/FDIS:2022.

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](http://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 4-1: Blank detail specification for radiating cables

#### 1 Scope

This part of IEC 61196, ~~which is a blank detail specification,~~ applies to radiating coaxial communication cables. These cables are intended for use in wireless communication system in long, narrow, semi-closed and indoor environment, such as tunnels, railways, highways, subways, elevators and other installations ~~in which conventional radio transmission is not satisfactory or even impossible.~~

It determines the layout and style for detail specifications. Detail specifications, based on the blank detail specification, ~~may~~ can be prepared by a national organization, a manufacturer, or a user.

#### 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 61196-1-124<sup>2</sup>, *Coaxial communication cables – Part 1-124: Electrical test methods – Test for coupling loss of radiating cable*

IEC 61196-4:2015<sup>3</sup>, *Coaxial communication cables – Part 4 Sectional specification for radiating cables*

#### 3 Terms and definitions

No terms and definitions are listed in this document.

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 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.

<sup>2</sup> Under preparation. Stage at the time of publication: IEC/FDIS 61196-1-124:2022.

<sup>3</sup> Under preparation. Stage at the time of publication: IEC/FDIS 61196-4:2022.

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

**NOTE 1** When a characteristic applies but a specific value is not considered necessary, then NS (for not specified) is entered.

The numbers shown in square 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 IEC 61196-4
- [11] Minimum requirements of the sectional specification IEC 61196-4
- [12] Remarks

## 5 Blank detail specification

Title	
<b>[1] Prepared by:</b> <b>Date:</b>	<b>[2] Document No.:</b>  Issue: <b>Date:</b>
<b>[3] Available from:</b>	<b>[4] Generic specification</b> IEC 61196-1 <b>Sectional specification</b> IEC 61196-4
<b>[5] Additional references:</b> IEC 61196-1-1XX, IEC 61196-1-2XX, IEC 61196-1-3XX	
<b>[6] Cable description:</b> a) Cable variant b) Material of inner conductor c) Material of dielectric d) Outer conductor e) Material of sheath (if any)	
<b>[7] Cable construction</b> a) Inner conductor Material Diameter (mm) nominal Tolerance (mm): ±...	

Title	
<p>Construction:</p> <p>For corrugated inner conductor:</p> <ul style="list-style-type: none"> <li>– Peak diameter and tolerance (mm):</li> <li>– Root diameter and tolerance (mm):</li> <li>– Pitch and tolerance (mm):</li> </ul> <p>For smooth inner conductor:</p> <ul style="list-style-type: none"> <li>– Diameter and thickness and tolerance (mm):</li> </ul> <p>For others:</p> <ul style="list-style-type: none"> <li>– Diameter and tolerance (mm):</li> </ul> <p>b) Dielectric</p> <p>Material</p> <p>Diameter (mm) nominal</p> <p>Tolerance (mm): ±...</p> <p>c) Outer conductor</p> <p>Material</p> <p><del>Diameter (mm) nominal</del></p> <p><del>Tolerance (mm): ±...</del></p> <p>Construction:</p> <p>For corrugated outer conductor:</p> <ul style="list-style-type: none"> <li>– Peak diameter and tolerance (mm):</li> <li>– Root diameter and tolerance (mm):</li> <li>– Pitch and tolerance (mm):</li> </ul> <p>For smooth tube outer conductor:</p> <p>Diameter and thickness and tolerance (mm):</p> <p>d) Sheath (if any)</p> <p>Material</p> <p>Minimum thickness (mm)</p> <p>Diameter (mm)</p> <p>Tolerance (mm): ± ...</p>	<p style="color: red; font-size: 2em; transform: rotate(-45deg); opacity: 0.5;">IEC NORM.COM: Click to view the full PDF of IEC 61196-4-1:2022 RLV</p>
<p><b>[8] Engineering information (reference only)</b></p> <ul style="list-style-type: none"> <li>a) Operating temperature range</li> <li>b) Storage temperature range</li> <li>c) Installation temperature range</li> <li>d) Operating frequency</li> <li>e) Cut-off frequency</li> <li>f) Stop frequency band</li> <li>g) Nominal characteristic impedance</li> <li><del>d) Maximum continue working voltage</del></li> <li>h) Minimum bending radius (static state)</li> <li>i) Minimum bending radius (dynamic state)</li> <li>j) Nominal weight</li> <li>k) Average and peak power rating</li> </ul>	

[9] — Parameter or characteristic	[10] — IEC 61196-4:2015 Subclause	[11] — Value	[12] — Remarks
<b>Electrical characteristics</b>	7.1		
Continuity	7.2.1		
Inner and outer conductor direct current resistance	7.2.2	Inner conductor ≤ ... Ω/km @ 20 °C Outer conductor ≤ ... Ω/km @ 20 °C	
Capacitance	7.2.3	Frequency: ≤ ... pF/m	
Withstand voltage of dielectric	7.2.4	... kV rms or ... DC	40 Hz ~ 60 Hz
Withstand voltage of sheath (or spark voltage) — <sup>a</sup>	7.2.5	... kV rms	40 Hz ~ 60 Hz
Insulation resistance	7.2.6	≥ ... MΩ·km	≥ 5 000 MΩ·km according to IEC 61196-4
Mean characteristic impedance	7.2.7	(... ± ...) Ω	200 MHz
Return loss	7.2.8	at ... MHz ≥ ... dB	
Attenuation constant	7.2.9	at ... MHz ≤ ... dB/100 m @ 20 °C	If necessary, refer to a table or graph at the end of the detail specification
Coupling loss	7.2.10	$\alpha_{650} < \dots$ dB @ ... MHz $\alpha_{695} < \dots$ dB @ ... MHz	If necessary, refer to a table or graph at the end of the detail specification
<b>Environmental characteristics</b>	7.3		
Ageing	7.3.1	Value in accordance with the detail specification	
Cold bend performance	7.3.2	Value in accordance with the detail specification	
Climatic sequence — method 1	7.3.3	Value in accordance with the detail specification	
Environmental stress cracking	7.3.4	Value in accordance with the detail specification	
<b>Mechanical characteristics</b>	7.4		
Visual examination	7.4.1	Pass	
Dimensional examination	7.4.2	Value in accordance with the detail specification	
Ovality of inner conductor	7.4.3	≤ ... %	
Ovality of outer conductor	7.4.4	≤ ... %	
Ovality of dielectric	7.4.5	≤ ... %	
Eccentricity of dielectric	7.4.6	≤ ... %	
Eccentricity of sheath	7.4.7	≤ ... %	

[9] — Parameter or characteristic	[10] — IEC 61196-4:2015 Subclause	[11] — Value	[12] — Remarks
Cable bending under tension	7.4.8	1) — length of the cable: 2) — length bent under tension: 3) — radius, $R$ , of rollers / cylinders / mandrels: 4) — distance, $Y$ : 5) — bending angle, $\phi$ : 6) — moving speed: 7) — tensile load:	
Crush resistance of cable	7.4.9	Load: $\geq \dots N$ Impedance irregularity: $\leq 1\%$	
Fire performance requirement	7.5	In accordance with the requirements of national or regional authorities, when required	
Flame propagation	7.5.1	In accordance with the requirements of national or regional authorities, when required	
Halogen acid gas emission	7.5.2	In accordance with the requirements of national or regional authorities, when required	
Toxic gas emission	7.5.3	In accordance with the requirements of national or regional authorities, when required	
Smoke density	7.5.4	In accordance with the requirements of national or regional authorities, when required	
<sup>a</sup> — Mark na, if not applicable.			

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[9] Parameter	[10] IEC 61196-4:-4 Subclause	[11] Value	[12] Remarks
<b>Electrical characteristics</b>	<b>8.2</b>		
Continuity	8.2.1	Inner and outer conductors shall be continuous	
Inner and outer conductor direct current resistance	8.2.2	$\leq \dots \Omega/\text{km}$	
Capacitance	8.2.3	Frequency: $\leq \dots \text{pF/m}$	
Withstand voltage of dielectric	8.2.4	3/8", 1/2": DC 6 kV 7/8", 1 1/4": DC 10 kV 1 5/8": DC 15 kV or according to the detail specifications	1 min
Spark-test of sheath	8.2.5	kV RMS	40 Hz to 60 Hz
Insulation resistance	8.2.6	$\geq 10^4 \text{ M}\Omega \cdot \text{km}$ or according to the detail specifications	
Mean characteristic impedance	8.2.7	$(50 \pm 2) \Omega$ or $(75 \pm 2) \Omega$	200 MHz
Return loss	8.2.8	$\geq 17,7 \text{ dB}$ at 10 MHz to 2 200 MHz $\geq 14,9 \text{ dB}$ at 2 200 MHz to 4 000 MHz $\geq 14,0 \text{ dB}$ at 4 000 MHz to 6 000 MHz or according to the detail specifications	Minimum length of specimen: 50 m. During the test, the cable should be uncoiled and installed on a test arrangement according to IEC 61196-1-124.
Attenuation constant/insertion loss	8.2.9	For non-uniformly radiating type cable: $\leq \dots \text{dB}/100 \text{ m}$ at 20 °C ... MHz For uniformly radiating type cable: $IL \leq \dots \text{dB}$ , $L = \dots \text{m}$	
Coupling loss (not applicable to uniform radiating type cable)	8.2.10	$L_{c,50} \leq \dots \text{dB}$ at ... MHz $L_{c,95} \leq \dots \text{dB}$ at ... MHz	
Link loss <sup>a</sup>	8.2.11	at lowest frequency point... MHz, $\leq \dots \text{dB}$ at mid-frequency point... MHz, $\leq \dots \text{dB}$ at highest frequency point ... MHz, $\leq \dots \text{dB}$	Specimen length: according to design requirements

<sup>4</sup> Under preparation. Stage at the time of publication: IEC 61196-4/FDIS:2022.

[9] Parameter	[10] IEC 61196-4:-4 Subclause	[11] Value	[12] Remarks
<b>Environmental characteristics</b>	<b>8.3</b>		
Ageing	8.3.1	a) No cracks or other physical damage to the elements of the sample. b) No visible black spots in the outer conductor.	The test temperature: 98 °C ± 2 °C (PVC) 90 °C ± 2 °C (LSZH, PE) Duration:168 h or according to the detail specifications
Cold bend performance	8.3.2	a) No cracks or other physical damage to the elements of the sample. b) The return loss shall be in accordance with 8.2.8.	The test for return loss shall be performed after the sample renew to room temperature.
Climatic sequence – method 1	8.3.3	No physical damages shall be visible in cable. b) The return loss shall be in accordance with 8.2.8.	CUT shall be specified in the detail specification $T_A$ = minimum environmental rated temperature $T_B$ = maximum environmental rated temperature $t_1$ = 16 h, unless otherwise specified in the detail specification. Humidity: 55 °C, 93 % RH 1 day (after cold and heat) No. of cycles:2, unless otherwise specified in the detail specification.
Environmental stress cracking	8.3.4	No physical damages shall be visible in cable	
<b>Mechanical characteristics</b>	<b>8.4</b>		
Visual examination	8.4.1	a) Sheath shall be free of cracks, burrs, impurities, or other defects that can affect life, serviceability and appearance. b) Outer conductors should be free of black spots and cracks.	
Dimensional examination	8.4.2	Value in accordance with the detail specification	
Ovality of inner conductor	8.4.3	≤ 7 %	
Ovality of dielectric	8.4.4	≤ 7 %	
Eccentricity of dielectric	8.4.5	≤ 8 %	
Eccentricity of sheath	8.4.6	≤ 43 %	
Cable bending	8.4.7	1) radius, $R$ , of rollers / cylinders / mandrels:10 times the maximum outer diameter of the cable; 2) cycles : three times Return loss shall remain in accordance with 8.2.8. No physical damage to the elements of the sample.	

[9] Parameter	[10] IEC 61196-4:-4 Subclause	[11] Value	[12] Remarks
Crush resistance of cable	8.4.8	Load: $\geq$ N Return loss shall remain in accordance with 8.2.8. No physical damage to the elements of the sample.	
Adhesion of dielectric	8.4.9	$\geq 98$ N or value in accordance with the detail specification	Specimen length: $L = 75$ mm $\pm 2$ mm
Shrinkage for insulations	8.4.10	$\leq 6,4$ mm	Test temperature: $115$ °C $\pm 2$ °C Time: 4 h cooling down to standard atmospheric conditions
Maximum pulling force of cable	8.4.11	Load $\geq$ N a) The return loss shall be in accordance with 8.2.8. b) No physical damage in cable.	
Fire performance requirement	8.5		
Flame propagation	8.5.2.1	It is not the intent of this document to specify this value, which can be separately subject to the requirements of national or regional authorities.	
Halogen acid gas emission	8.5.2.2	It is not the intent of this document to specify this value, which can be separately subject to the requirements of national or regional authorities.	
Toxic gas emission	8.5.2.3	It is not the intent of this document to specify this value, which can be separately subject to the requirements of national or regional authorities.	
Smoke density	8.5.2.4	It is not the intent of this document to specify this value, which can be separately subject to the requirements of national or regional authorities.	
<sup>a</sup> When required.			

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# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

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**Câbles coaxiaux de communication –  
Partie 4-1: Spécification particulière-cadre pour câbles rayonnants**

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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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

This part of IEC 61196 is to be read in conjunction with IEC 61196-1:2005 and IEC 61196-4:—1.

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](http://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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<sup>1</sup> Under preparation. Stage at the time of publication: IEC 61196-4/FDIS:2022.

## COAXIAL COMMUNICATION CABLES –

### Part 4-1: Blank detail specification for radiating cables

#### 1 Scope

This part of IEC 61196 applies to radiating coaxial communication cables. These cables are intended for use in wireless communication system in long, narrow, semi-closed and indoor environment, such as tunnels, railways, highways, subways, elevators and other installations.

It determines the layout and style for detail specifications. Detail specifications, based on the blank detail specification, can be prepared by a national organization, a manufacturer, or a user.

#### 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 61196-1-124<sup>2</sup>, *Coaxial communication cables – Part 1-124: Electrical test methods – Test for coupling loss of radiating cable*

IEC 61196-4:<sup>3</sup>, *Coaxial communication cables – Part 4 Sectional specification for radiating cables*

#### 3 Terms and definitions

No terms and definitions are listed in this document.

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 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 (for not applicable) is entered in the appropriate space.

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<sup>2</sup> Under preparation. Stage at the time of publication: IEC/FDIS 61196-1-124:2022.

<sup>3</sup> Under preparation. Stage at the time of publication: IEC/FDIS 61196-4:2022.

NOTE 1 When a characteristic applies but a specific value is not considered necessary, then NS (for not specified) is entered.

The numbers shown in square 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 IEC 61196-4
- [11] Minimum requirements of the sectional specification IEC 61196-4
- [12] Remarks

**5 Blank detail specification**

Title	
<p>[1] <b>Prepared by:</b> <b>Date:</b></p>	<p>[2] <b>Document No.:</b> <b>Issue:</b></p>
<p>[3] <b>Available from:</b></p>	<p>[4] <b>Generic specification</b> IEC 61196-1 <b>Sectional specification</b> IEC 61196-4</p>
<p>[5] <b>Additional references:</b> IEC 61196-1-1XX, IEC 61196-1-2XX, IEC 61196-1-3XX</p>	
<p>[6] <b>Cable description:</b> a) Cable variant b) Material of inner conductor c) Material of dielectric d) Outer conductor e) Material of sheath (if any)</p>	

Title	
<p><b>[7] Cable construction</b></p> <p>a) Inner conductor</p> <p>Material</p> <p>Construction:</p> <p>For corrugated inner conductor:</p> <ul style="list-style-type: none"> <li>– Peak diameter and tolerance (mm):</li> <li>– Root diameter and tolerance (mm):</li> <li>– Pitch and tolerance (mm):</li> </ul> <p>For smooth inner conductor:</p> <ul style="list-style-type: none"> <li>– Diameter and thickness and tolerance (mm):</li> </ul> <p>For others:</p> <ul style="list-style-type: none"> <li>– Diameter and tolerance (mm):</li> </ul> <p>b) Dielectric</p> <p>Material</p> <p>Diameter (mm) nominal</p> <p>Tolerance (mm): ±...</p> <p>c) Outer conductor</p> <p>Material</p> <p>Construction:</p> <p>For corrugated outer conductor:</p> <ul style="list-style-type: none"> <li>– Peak diameter and tolerance (mm):</li> <li>– Root diameter and tolerance (mm):</li> <li>– Pitch and tolerance (mm):</li> </ul> <p>For smooth tube outer conductor:</p> <p>Diameter and thickness and tolerance (mm):</p> <p>d) Sheath (if any)</p> <p>Material</p> <p>Minimum thickness (mm)</p> <p>Diameter (mm)</p> <p>Tolerance (mm): ± ...</p>	
<p><b>[8] Engineering information (reference only)</b></p> <p>a) Operating temperature range</p> <p>b) Storage temperature range</p> <p>c) Installation temperature range</p> <p>d) Operating frequency</p> <p>e) Cut-off frequency</p> <p>f) Stop frequency band</p> <p>g) Nominal characteristic impedance</p> <p>h) Minimum bending radius (static state)</p> <p>i) Minimum bending radius (dynamic state)</p> <p>j) Nominal weight</p> <p>k) Average and peak power rating</p>	

[9] Parameter	[10] IEC 61196-4:- <sup>4</sup> Subclause	[11] Value	[12] Remarks
<b>Electrical characteristics</b>	<b>8.2</b>		
Continuity	8.2.1	Inner and outer conductors shall be continuous	
Inner and outer conductor direct current resistance	8.2.2	≤ ... Ω/km	
Capacitance	8.2.3	Frequency: ≤ ... pF/m	
Withstand voltage of dielectric	8.2.4	3/8", 1/2": DC 6 kV 7/8", 1 1/4": DC 10 kV 1 5/8": DC 15 kV or according to the detail specifications	1 min
Spark-test of sheath	8.2.5	kV RMS	40 Hz to 60 Hz
Insulation resistance	8.2.6	≥10 <sup>4</sup> MΩ·km or according to the detail specifications	
Mean characteristic impedance	8.2.7	(50 ± 2) Ω or (75 ± 2) Ω	200 MHz
Return loss	8.2.8	≥ 17,7 dB at 10 MHz to 2 200 MHz ≥ 14,9 dB at 2 200 MHz to 4 000 MHz ≥ 14,0 dB at 4 000 MHz to 6 000 MHz or according to the detail specifications	Minimum length of specimen: 50 m. During the test, the cable should be uncoiled and installed on a test arrangement according to IEC 61196-1-124.
Attenuation constant/insertion loss	8.2.9	For non-uniformly radiating type cable: ≤ ... dB/100 m at 20 °C ... MHz For uniformly radiating type cable: IL ≤ ... dB, L = ... m	
Coupling loss (not applicable to uniform radiating type cable)	8.2.10	$L_{c,50} \leq \dots$ dB at ... MHz $L_{c,95} \leq \dots$ dB at ... MHz	
Link loss <sup>a</sup>	8.2.11	at lowest frequency point... MHz, ≤ ... dB at mid-frequency point... MHz, ≤ ... dB at highest frequency point ... MHz, ≤ ... dB	Specimen length: according to design requirements

<sup>4</sup> Under preparation. Stage at the time of publication: IEC 61196-4/FDIS:2022.

[9] Parameter	[10] IEC 61196-4:- <sup>4</sup> Subclause	[11] Value	[12] Remarks
<b>Environmental characteristics</b>	<b>8.3</b>		
Ageing	8.3.1	a) No cracks or other physical damage to the elements of the sample. b) No visible black spots in the outer conductor.	The test temperature: 98 °C ± 2 °C (PVC) 90 °C ± 2 °C (LSZH, PE) Duration:168 h or according to the detail specifications
Cold bend performance	8.3.2	a) No cracks or other physical damage to the elements of the sample. b) The return loss shall be in accordance with 8.2.8.	The test for return loss shall be performed after the sample renew to room temperature.
Climatic sequence – method 1	8.3.3	No physical damages shall be visible in cable. b) The return loss shall be in accordance with 8.2.8.	CUT shall be specified in the detail specification $T_{\min}$ = minimum environmental rated temperature $T_{\max}$ = maximum environmental rated temperature $t_1$ = 16 h, unless otherwise specified in the detail specification. Humidity: 55 °C, 93 % RH 1 day (after cold and heat) No. of cycles:2, unless otherwise specified in the detail specification.
Environmental stress cracking	8.3.4	No physical damages shall be visible in cable	
<b>Mechanical characteristics</b>	<b>8.4</b>		
Visual examination	8.4.1	a) Sheath shall be free of cracks, burrs, impurities, or other defects that can affect life, serviceability and appearance. b) Outer conductors should be free of black spots and cracks.	
Dimensional examination	8.4.2	Value in accordance with the detail specification	
Ovality of inner conductor	8.4.3	≤ 7 %	
Ovality of dielectric	8.4.4	≤ 7 %	
Eccentricity of dielectric	8.4.5	≤ 8 %	
Eccentricity of sheath	8.4.6	≤ 43 %	
Cable bending	8.4.7	1) radius, $R$ , of rollers / cylinders / mandrels:10 times the maximum outer diameter of the cable; 2) cycles : three times Return loss shall remain in accordance with 8.2.8. No physical damage to the elements of the sample.	

[9] Parameter	[10] IEC 61196-4:- <sup>4</sup> Subclause	[11] Value	[12] Remarks
Crush resistance of cable	8.4.8	Load: ≥ N Return loss shall remain in accordance with 8.2.8. No physical damage to the elements of the sample.	
Adhesion of dielectric	8.4.9	≥98 N or value in accordance with the detail specification	Specimen length: $L = 75 \text{ mm} \pm 2 \text{ mm}$
Shrinkage for insulations	8.4.10	≤6,4 mm	Test temperature: $115 \text{ °C} \pm 2 \text{ °C}$ Time: 4 h cooling down to standard atmospheric conditions
Maximum pulling force of cable	8.4.11	Load ≥ N a) The return loss shall be in accordance with 8.2.8. b) No physical damage in cable.	
Fire performance requirement	8.5		
Flame propagation	8.5.2.1	It is not the intent of this document to specify this value, which can be separately subject to the requirements of national or regional authorities.	
Halogen acid gas emission	8.5.2.2	It is not the intent of this document to specify this value, which can be separately subject to the requirements of national or regional authorities.	
Toxic gas emission	8.5.2.3	It is not the intent of this document to specify this value, which can be separately subject to the requirements of national or regional authorities.	
Smoke density	8.5.2.4	It is not the intent of this document to specify this value, which can be separately subject to the requirements of national or regional authorities.	
<sup>a</sup> When required.			

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## COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

## CÂBLES COAXIAUX DE COMMUNICATION –

## Partie 4-1: Spécification particulière-cadre pour câbles rayonnants

## AVANT-PROPOS

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L'IEC 61196-4-1 a été établie par le sous-comité 46A: Câbles coaxiaux, du comité d'études 46 de l'IEC: Câbles, fils, guides d'ondes, connecteurs, composants passifs pour micro-onde et accessoires. Il s'agit d'une Norme internationale.

Cette deuxième édition annule et remplace la première édition parue en 2016. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) réécriture de "1 Domaine d'application" pour assurer la cohérence avec les autres spécifications particulières-cadres des câbles coaxiaux;
- b) ajout d'exigences détaillées concernant la construction des conducteurs intérieur et extérieur en "[7] Construction du câble";

- c) ajout de "Plage de températures de stockage", "plage de températures d'installation" et "Bande de fréquences d'arrêt" en "[8] Informations techniques (référence uniquement)";
- d) ajout de "8.2.11 Perte de liaison", "8.4.9 Adhérence du diélectrique", "8.4.10 Rétraction des enveloppes isolantes", "8.4.11 Force de traction maximale du câble";
- e) ajout de différentes exigences détaillées ou de valeurs types en 8.2.4, 8.2.6 à 8.2.8, 8.3.1 à 8.3.4, 8.4.1, 8.4.3 à 8.4.8;
- f) suppression de "7.4.4 Ovalité du conducteur extérieur".

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
46A/1584/FDIS	46A/1599/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, et a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). Les principaux types de documents développés par l'IEC sont décrits plus en détail sous [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

La présente partie de l'IEC 61196 doit être lue conjointement avec l'IEC 61196-1:2005 et l'IEC 61196-4:—<sup>1</sup>.

Une liste de toutes les parties de la série IEC 61196, publiée sous le titre général *Câbles coaxiaux de communication*, se trouve sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous [webstore.iec.ch](http://webstore.iec.ch) dans les données relatives au document recherché. A cette date, le document sera

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<sup>1</sup> En cours d'élaboration. Stade au moment de la publication: IEC 61196-4/FDIS:2022.