

INTERNATIONAL STANDARD



**Coaxial communication cables –
Part 6-1: Blank detail specification for CATV drop cables**

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	5
4 Guidance for preparation of a detail specification	5
5 Blank detail specification	6
Annex A (normative) Cable identification and marking	12
A.1 Cable identification.....	12
A.1.1 Type name.....	12
A.1.2 Variants	12
A.1.3 Screening classes	12
A.2 Cable marking.....	13
Annex B (normative) Maximum attenuation.....	14

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COAXIAL COMMUNICATION CABLES –

Part 6-1: Blank detail specification for CATV drop 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.
- 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.
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- 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) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 61196-6-1:2009. 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 61196-6-1 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 2009. This edition constitutes a technical revision.

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

a) Annex A, Cable identification and marking was added.

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

FDIS	Report on voting
46A/1497/FDIS	46A/1515/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.

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.

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/reldocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

It is to be used in conjunction with IEC 61196-1:2005 and IEC 61196-6:2021

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

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- withdrawn,
- replaced by a revised edition, or
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COAXIAL COMMUNICATION CABLES –

Part 6-1: Blank detail specification for CATV drop cables

1 Scope

This blank detail specification applies to ~~CATV~~ coaxial communication cables as described in IEC 61196-6. It specifies the requirements for drop cables for use in cabled television distribution networks operating at temperatures between –40 °C and +70 °C and in the frequency range from 5 MHz to 1 000 MHz or from 5 MHz to 3 000 MHz ~~as described in IEC 61196-6 and is to be read in conjunction with IEC 61196-1 and IEC 61196-6.~~

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 61196-6:2021, *Coaxial communication cables – Part 6: Sectional specification for CATV drop cables*

IEC 61196-1-310, *Coaxial communication cables – Part 1-310: Mechanical test methods – Test for torsion characteristics of copper-clad metals*

IEC 61196-1-314:2015, *Coaxial communication cables – Part 1-314: Mechanical test methods – Test for bending*

~~IEC 62153-4-4, *Metallic communication cable test methods – Part 4-4: Electromagnetic compatibility (EMC) – Shielded screening attenuation, test method for measuring of the screening attenuation "a_s" up to and above 3 GHz.*~~

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 preparation of a detail specification

The detail specification shall be written in accordance with the layout of the pro-forma blank detail specification that forms part of this document.

NOTE When a characteristic does not apply, in accordance with IEC 61196-6, then NA (for Not Applicable) shall be entered in the appropriate space.

When a characteristic applies but a specific value is considered not necessary, then NS (for Not Specified) shall be entered in the appropriate space.

When NS is used, the appropriate requirement in the sectional specification shall apply.

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

- [1] Name and address of the manufacturer of the cable
- [2] IEC document number and date of issue
- [3] Related IEC documents
- [4] Product type/model of cable
- [5] Any other reference standards (International, National, etc.) to the cable
- [6] Parameter or characteristic of the cable
- [7] Reference to the relevant subclause of the sectional specification
- [8] Manufacturer specification of the cable
- [9] Minimum requirements defined within the generic or sectional specification
- [10] Manufacturer to insert any additional test parameters, methods, specifications, etc.

5 Blank detail specification

[1] Manufacturer and address:	[2] Issue: IEC 61196-6-1 Date:
	[3] Generic specification: IEC 61196-1 Sectional specification: IEC 61196-6
[4] Product type/model:	[5] Additional references:

[6] Parameter or characteristic	[7]	[8]	[9]
Cable construction (dimensions in mm)	IEC 61196-6 Clause/Subclause	Manufacturer specification	Minimum requirement
Inner conductor	4.2		
Material	4.2.1		NS
Diameter	4.2.2		NS
Tolerance	4.2.2		± 0,03 mm
Dielectric	4.3		
Material	4.3		NS
Diameter	4.3		NS
Tolerance	4.3		± 0,15 mm
Outer conductor	4.4		
Type and construction	4.4		NS
Material	4.4		NS
Diameter	4.4		NS
Tolerance	4.4		± 0,20 mm
Sheath or jacket	4.5		NS
Material	4.5		NS
Thickness	4.5		NS
Diameter	4.5		NS
Tolerance	4.5		± 0,25 mm
Integral messenger	4.5		
Material	4.5		NS
Diameter	4.5		NS
Minimum tensile strength (kgf)	4.5		NS
Elongation	4.5		NS
Corrosion properties	4.5		NS
Additional information			
Overall dimension (width) of cable	4.6		NS
Standard ratings and characteristics	5		NS
Cable identification and markings	6		As defined in 6.1.1 of IEC 61196-6 According to Annex A
NS: Not specified NA: Not applicable			

[6] Parameter or characteristic	[7]	[8]	[9]
Completed cable tests	IEC 61196-6 Clause/Subclause	Manufacturer specification	Minimum requirement
Electrical testing of finished cable	7.2		
Conductor resistance:	7.2.1.1		NS
Inner conductor			
Outer conductor			
Loop (outer + inner)			
Insulation resistance	7.2.1.2		$\geq 10^4$ M Ω $\times$ km
Withstand voltage of dielectric	7.2.1.3		2 kV DC or 1,5 kV AC for 1 min See Note 1
Withstand voltage of sheath	7.2.1.4		3,5 kV DC or 2,5 kV AC for 1 min See Note 1
Current carrying capacity	7.2.1.5		NS
Spark test	7.2.1.6		2,5 kV AC or 3,75 kV DC, or pulse, or 3,5 kV HF
High-frequency electrical and transmission measurements	7.2.2		
Operational frequency			5 MHz to 1 000 MHz or 5 MHz to 3 000 MHz
Characteristic impedance	7.2.2.1		75 $\Omega \pm 3 \Omega$
Relative propagation velocity (velocity ratio)	7.2.2.2		NS
Return loss (uniformity of impedance)	7.2.2.3		5 MHz to 1 000 MHz: ≥ 20 dB; 1 000 MHz to 2 000 MHz: ≥ 18 dB; 2 000 MHz to 3 000 MHz: ≥ 16 dB The measurement inaccuracy $\Delta a_{r,f}$ shall be < 1 dB.
Attenuation constant, α	7.2.2.4		$\alpha = a + \sqrt{f} + b \times f + c$ or for copper clad conductors $\alpha = a + \sqrt{f} + b \times f + c + d/\sqrt{f}$ $a = \text{---}, b = \text{---}, c = \text{---}$ and if applicable $d = \text{---}$ Refer to Annex B for discrete values at 200 MHz and 800 MHz
Regularity of impedance	7.2.2.5		≥ 40 dB resp $\leq 1 \%$
Transfer impedance after flex note 2	7.2.2.6		Screening class "C" " " according to IEC 61196-6
Screening attenuation after flex note 2 according to test procedure	7.2.2.7		Screening class "C" IEC 62153-4-4 (triaxial method) " " according to IEC 61196-6

[6] Parameter or characteristic Completed cable tests	[7] IEC 61196-6 Clause/Subclause	[8] Manufacturer specification	[9] Minimum requirement
Screening class note 2	7.1.2.6 and 7.1.2.7		See IEC 61196-6, Table 2
NS: Not specified NA: Not applicable			

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[6] Parameter or characteristic	[7]	[8]	[9]
Completed cable tests	IEC 61196-6 Clause/Subclause	Manufacturer specification	Minimum requirement
Environmental testing of finished cable	7.3		
Cold bend	7.3.1		Test method Method B mandrel diameter is Test temperature is... No physical damages of conductors, dielectric and sheaths
Water penetration	7.3.2		NS
Climatic sequence	7.3.3		See IEC 61196-6, Table 3
Damp heat (steady state)	7.3.4		See IEC 61196-6, Table 3
Ultraviolet stability of sheath or jacket	7.3.5		a) No visual cracks b) Magnitude of change in elongation ≤ 20 % after 720 h c) Magnitude of change in tensile strength ≤ 20 % after 720 h
Thermal ageing	7.3.6		Transmission characteristics shall remain within the specified limits
Mechanical characteristics of finished cable	7.4		
Ovality of dielectric	7.4.1		≤ 7 %
Ovality of sheath	7.4.2		≤ 7 %
Eccentricity of dielectric	7.4.3		≤ 10 %
Eccentricity of sheath	7.4.4		≤ 10 %
Carbon black content, where applicable	7.4.5		≥ 2 %
Tensile strength and elongation of the copper or copper-clad metals	7.4.6		Shall be in accordance with IEC 61196-1:2005, 4.4.1.
Torsion test for copper-clad metals	7.4.7		Shall be in accordance with IEC 61196-1-310 if applicable
Adhesion testing: inner conductor to dielectric	7.4.8		See IEC 61196-6, Table 4
Bending	7.4.9		NS
Tensile strength of cable (longitudinal pull)	7.4.10		NS
Crush resistance of cable	7.4.11		See IEC 61196-6, Table 4
Abrasion resistance	7.4.12		NS

[6] Parameter or characteristic Completed cable tests	[7] IEC 61196-6 Clause/Subclause	[8] Manufacturer specification	[9] Minimum requirement
NOTE 1 Figures provided are the default values. Other values may can be specified. NOTE 2 Flexure test method is performed per IEC 61196-1-314:2015, 8.3.3, procedure 2, Radius of pulleys: 10 × diameter of cable, Tension: As defined in 7.3.10 of this standard. Speed: ≤ 1 m/s, Number of cycles: 3			
NS: Not specified NA: Not applicable			
[10] Additional tests, methods, and other information			

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Annex A (normative)

Cable identification and marking

A.1 Cable identification

A.1.1 Type name

Cable type shall be identified by the following:

- a number giving the nominal characteristic impedance of the cable in ohms, "75",
- a number that corresponds to the approximate dielectric outer diameter in mm; for example, the nominal dielectric diameter 3,66 mm shall be expressed by "4",
- a letter that corresponds to the different outer conductor construction types, see A.1.2,
- letters that correspond to the different inner conductor types, see A.1.2,
- letters that correspond to the different outer conductor construction types, see A.1.2,
- letters that correspond to the different outer conductor materials, see A.1.2,
- a designation of the different screening classes, see A.1.2,
- the number of the IEC standard (61196-6-2).

A.1.2 Variants

The variant of cables should be identified by the following:

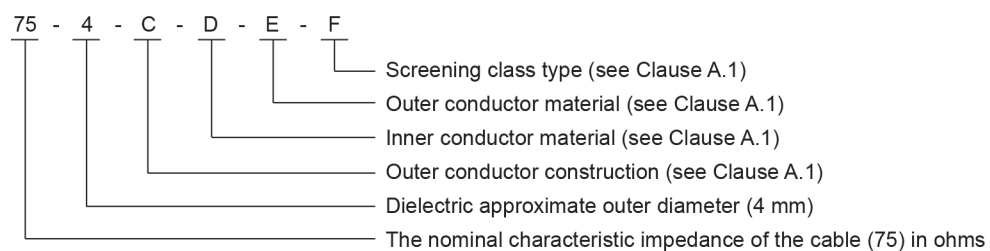
- 1) type name (75),
- 2) approximate dielectric outer diameter (4),
- 3) outer conductor construction distinguishing letters:
 - S – Standard shield outer conductor (foil/braid)
 - T – Tri-shield shield outer conductor (foil/braid/foil)
 - Q – Quad-shield shield outer conductor (foil/braid/foil/braid)
- 4) inner conductor material
 - BC – Bare copper
 - CCS – Copper clad steel
- 5) outer conductor material
 - a) ALT – Aluminium-polymeric laminated tape
 - b) AL – Aluminium alloy wire
 - c) TC – Tinned copper wiree.g. ALT/TC/ALT or ALT/AL/ALT/AL
- 6) screening class (same class for transfer impedance and screening attenuation)
 - a) A+, A, B or C.

A.1.3 Screening classes

Screening classes of transfer impedance and screening attenuation shall be consistent. The lower class determines the screening class of the overall cable: e.g. if the transfer impedance fulfils the requirement of screening class B and the screening attenuation fulfils the requirement of screening class A, then the overall screening class of the cable is screening class B, not class A.

A.2 Cable marking

Cable marking consists of variants and IEC standard number, for example:



Example: 75-4T-BC-ALT/BC/ALT-A – IEC 61196-6-x

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Annex B (normative)

Maximum attenuation

Frequency specified MHz	Maximum attenuation: dB/100 m at 20 °C
—	—
—	—
—	—
—	—
200	—
—	—
—	—
—	—
—	—
800	—
—	—
—	—
2 400	—
3 000	—
—	—

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CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	5
4 Guidance for preparation of a detail specification	5
5 Blank detail specification	6
Annex A (normative) Cable identification and marking	10
A.1 Cable identification.....	10
A.1.1 Type name.....	10
A.1.2 Variants	10
A.1.3 Screening classes	10
A.2 Cable marking.....	11
Annex B (normative) Maximum attenuation.....	12

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COAXIAL COMMUNICATION CABLES –

Part 6-1: Blank detail specification for CATV drop cables

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IEC 61196-1-314:2015, *Coaxial communication cables – Part 1-314: Mechanical test methods – Test for bending*

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4 Guidance for preparation of a detail specification

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When a characteristic applies but a specific value is considered not necessary, then NS (for Not Specified) shall be entered in the appropriate space.

When NS is used, the appropriate requirement in the sectional specification shall apply.

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

- [1] Name and address of the manufacturer of the cable
- [2] IEC document number and date of issue
- [3] Related IEC documents
- [4] Product type/model of cable
- [5] Any other reference standards (International, National, etc.) to the cable
- [6] Parameter or characteristic of the cable
- [7] Reference to the relevant subclause of the sectional specification
- [8] Manufacturer specification of the cable
- [9] Minimum requirements defined within the generic or sectional specification
- [10] Manufacturer to insert any additional test parameters, methods, specifications, etc.

5 Blank detail specification

[1] Manufacturer and address:	[2] Issue: IEC 61196-6-1 Date:
	[3] Generic specification: IEC 61196-1 Sectional specification: IEC 61196-6
[4] Product type/model:	[5] Additional references:

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[6] Parameter or characteristic	[7]	[8]	[9]
Cable construction (dimensions in mm)	IEC 61196-6 Clause/Subclause	Manufacturer specification	Minimum requirement
Inner conductor	4.2		
Material	4.2.1		NS
Diameter	4.2.2		NS
Tolerance	4.2.2		± 0,03 mm
Dielectric	4.3		
Material	4.3		NS
Diameter	4.3		NS
Tolerance	4.3		± 0,15 mm
Outer conductor	4.4		
Type and construction	4.4		NS
Material	4.4		NS
Diameter	4.4		NS
Tolerance	4.4		± 0,20 mm
Sheath or jacket	4.5		NS
Material	4.5		NS
Thickness	4.5		NS
Diameter	4.5		NS
Tolerance	4.5		± 0,25 mm
Integral messenger	4.5		
Material	4.5		NS
Diameter	4.5		NS
Minimum tensile strength (kgf)	4.5		NS
Elongation	4.5		NS
Corrosion properties	4.5		NS
Additional information			
Overall dimension (width) of cable	4.6		NS
Standard ratings and characteristics	5		NS
Cable identification and markings	6		According to Annex A
NS: Not specified NA: Not applicable			

[6] Parameter or characteristic	[7]	[8]	[9]
Completed cable tests	IEC 61196-6 Clause/Subclause	Manufacturer specification	Minimum requirement
Electrical testing of finished cable	7.2		
Conductor resistance:	7.2.1.1		NS
Inner conductor			
Outer conductor			
Loop (outer + inner)			
Insulation resistance	7.2.1.2		$\geq 10^4 \text{ M}\Omega \times \text{km}$
Withstand voltage of dielectric	7.2.1.3		2 kV DC or 1,5 kV AC for 1 min See Note 1
Withstand voltage of sheath	7.2.1.4		3,5 kV DC or 2,5 kV AC for 1 min See Note 1
Current carrying capacity	7.2.1.5		NS
Spark test	7.2.1.6		2,5 kV AC or 3,75 kV DC, or pulse, or 3,5 kV HF
High-frequency electrical and transmission measurements	7.2.2		
Operational frequency			5 MHz to 1 000 MHz or 5 MHz to 3 000 MHz
Characteristic impedance	7.2.2.1		$75 \Omega \pm 3 \Omega$
Relative propagation velocity (velocity ratio)	7.2.2.2		NS
Return loss (uniformity of impedance)	7.2.2.3		5 MHz to 1 000 MHz: $\geq 20 \text{ dB}$; 1 000 MHz to 2 000 MHz: $\geq 18 \text{ dB}$; 2 000 MHz to 3 000 MHz: $\geq 16 \text{ dB}$ The measurement inaccuracy $\Delta a_{r,f}$ shall be $< 1 \text{ dB}$.
Attenuation constant, α	7.2.2.4		$\alpha = a + \sqrt{f} + b \times f + c$ or for copper clad conductors $\alpha = a + \sqrt{f} + b \times f + c + d/\sqrt{f}$ $a = \text{---}, b = \text{---}, c = \text{---}$ and if applicable $d = \text{---}$ Refer to Annex B for discrete values at 200 MHz and 800 MHz
Regularity of impedance	7.2.2.5		$\geq 40 \text{ dB}$ resp $\leq 1 \%$
Transfer impedance	7.2.2.6		Screening class “_” according to IEC 61196-6
Screening attenuation	7.2.2.7		Screening class “_” according to IEC 61196-6
NS: Not specified NA: Not applicable			