

# INTERNATIONAL STANDARD

---

**Coaxial communication cables –  
Part 5-1: Blank detail specification for CATV trunk and distribution cables**





## THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2012 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 Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
Fax: +41 22 919 03 00  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://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 corrigenda or an amendment might have been published.

#### Useful links:

IEC publications search - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

The advanced search enables you 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It also gives information on projects, replaced and withdrawn publications.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](http://webstore.iec.ch/justpublished)

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

Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary (IEV) on-line.

Customer Service Centre - [webstore.iec.ch/csc](http://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: [csc@iec.ch](mailto:csc@iec.ch).



IEC 61196-5-1

Edition 2.0 2012-09

# INTERNATIONAL STANDARD

---

**Coaxial communication cables –  
Part 5-1: Blank detail specification for CATV trunk and distribution cables**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

PRICE CODE

M

ICS 33.120.10

ISBN 978-2-83220-393-4

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

## CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references .....	5
3 Guidance for preparation of a detail specification .....	5
4 Blank detail specification .....	7
Annex A (normative) Maximum attenuation .....	12
Bibliography.....	13

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## COAXIAL COMMUNICATION CABLES –

**Part 5-1: Blank detail specification for  
CATV trunk and distribution 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.
- 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) 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.

International Standard IEC 61196-5-1 has been prepared by subcommittee 46A: Coaxial cables, of IEC technical committee 46: Cables, wires, waveguides, R.F. connectors, R.F. and microwave passive components and accessories.

The text of this standard is based on the following documents:

FDIS	Report on voting
46A/1096/FDIS	46A/1118/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This second edition cancels and replaces the first edition published in 2007. It constitutes a technical revision.

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

The document has been updated and matched to the mother document IEC 61196-5.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of 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 publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

A bilingual version of this publication may be issued at a later date.

## COAXIAL COMMUNICATION CABLES –

### Part 5-1: Blank detail specification for CATV trunk and distribution cables

#### 1 Scope

This part of IEC 61196 applies to CATV cables. It specifies the requirements for drop cables for use in cabled television distribution networks operating at temperatures between –40 °C and +65 °C and in the frequency range from 5 MHz to 1 002 MHz as described in IEC 61196-5.

#### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 61196-5:2012, *Coaxial communication cables – Part 5: Sectional specification for CATV trunk and distribution cables*

IEC 61196-1-314:2006, *Coaxial communication cables – Part 1-314: Mechanical test methods – Test for bending*

IEC 62153-4-3, *Metallic communication cable test methods – Part 4-3 Electromagnetic compatibility (EMC) – Surface transfer impedance – Triaxial method*

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 as up to and above 3 GHz*

#### 3 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 standard.

When a characteristic does not apply, in accordance with IEC 61196-5, then NA (for Not Applicable) shall be entered in the appropriate space of column 8.

When a characteristic applies but a specific value is considered not necessary, then NS (for Not Specified) shall be entered in the appropriate space of column 9.

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.



#### 4 Blank detail specification

[1] Manufacturer and address:	[2] Issue: CEI/IEC 61196-5-1 Date:		
	[3] Generic specification: IEC 61196-1 Sectional specification: IEC 61196-5		
[4] Product type/model:	[5] Additional references:		
[6] Parameter or characteristic  Cable construction (dimensions in mm)	[7] IEC 61196-5 subclause	[8] Manufacturer specification	[9] Minimum requirement
Inner conductor	4.2		
Material	4.2.1		NS
Diameter	4.2.2		NS
Tolerance	4.2.2		±0,03 mm (diameter ≤4,0 mm)
			(diameter ≥4,0 mm)
Dielectric	4.3		
Material	4.3		NS
Construction	4.3		– solid, or – air spaced, or – semi air spaced, or – gas-injected cellular polymer
Outer conductor	4.4		
Type and construction	4.4		NS
Material	4.4		NS
Diameter	4.4		NS
Thickness	4.4		NS
Tolerance	4.4		±0,05 mm as defined in 4.6.1 c) of IEC 61196-1 (excluding corrugated designs)
			±0,30 mm for all other constructions noted in 4.6.1 of IEC 61196-1
Braid angle (when required)	4.4		between 15° and 45°
Braid coverage factor (when required)	4.4		NS
Sheath or jacket	4.5		
Material	4.5		thermoplastic material
Thickness	4.5		NS
Diameter	4.5		NS
Diameter tolerance	4.5		NS
NS: Not specified    NA: Not applicable			

<b>Integral messenger</b>	4.5		
Material	4.5		NS
Minimum tensile strength	4.5		NS
Elongation	4.5		NS
Corrosion properties	4.5		NS
<b>Completed cable</b>	4.6		
Overall diameter (dimension/s) of cable	4.6		NS
Dimension/s tolerance	4.6		NS
<b>Standard ratings and characteristics</b>	5.0		NS
<b>Cable identification</b>	6.0		According to 6.1 of IEC 61196-1
Identification and markings	6.2		Unless otherwise specified, according to 6.2 of IEC 61196-1
Labelling	6.3		Unless otherwise specified, according to 6.3 of IEC 61196-1
<b>Electrical testing of finished cable</b>	7.2		
Conductor resistance: Inner conductor Outer conductor Loop (outer + inner)	7.2.1.1		NS
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 d.c. or 1,5 kV a.c. for 1 min <sup>a</sup>
Withstand voltage of sheath (r.m.s.)	7.2.1.4		Unless otherwise specified,  Sheath thickness up to and including 0,5 mm = 1 kV  Sheath thickness over 0,5 mm and up to and including 0,8 mm = 2 kV  Sheath thickness over 0,8 mm and up to and including 1,0 mm = 3 kV  Sheath thickness over 1,0 mm = 5 kV
Current carrying capacity	7.2.1.5		NS
High-frequency electrical and transmission measurements	7.2.2		
Operational frequency			5 MHz to 1 002 MHz
Characteristic impedance	7.2.2.1		$75 \Omega \pm 2 \Omega$ unless the tolerance is otherwise specified.
Relative propagation velocity (velocity ratio)	7.2.2.2		NS
<b>NS: Not specified    NA: Not applicable</b>			

[6] Parameter or characteristic Completed cable tests	[7] IEC 61196-5 subclause	[8] Manufacturer specification	[9] Minimum requirement
Return loss	7.2.2.3		5 MHz to 1 002 MHz: $ RZL  \geq 26$ dB; The measurement inaccuracy $a_{r,f}$ , shall be <1 dB.
Attenuation constant, $\alpha$	7.2.2.4		$\alpha = 10 \times \log_{10}(P_1/P_2) \times 100/l$ in (dB/100 m) where $\alpha$ is the attenuation constant in dB/100 m (frequency dependent); $P_1$ is the output power of a source where the load impedance and the source impedance are equal and of the same value as the nominal value of the specimen; $P_2$ is the output power measured when the specimen is inserted into the test system, where the load impedance and the source impedance are equal and of the same value as the nominal value of the specimen; $l$ is the physical length of the specimen in meters (m); Refer to Annex A for discrete values at 200 MHz and 800 MHz.
Regularity of impedance	7.2.2.5		$\geq 40$ dB resp. $\leq 1$ %
Transfer impedance After flex: See Note 2	7.2.2.6		Class A: $\leq 5$ m $\Omega$ /m from 5 MHz to 30 MHz Class A+: $\leq 2,5$ m $\Omega$ /m from 5 MHz to 30 MHz Class A++: $\leq 0,5$ $\Omega$ /m from 5 MHz to 30 MHz IEC 62153-4-3 (triaxial method)
Screening attenuation After flex: See Note 2	7.2.2.7		Class A: $\geq 85$ dB from 30 MHz to 1 002 MHz Class A+: $\geq 95$ dB from 30 MHz to 1 002 MHz Class A++: $\geq 105$ dB from 30 MHz to 1 002 MHz IEC 62153-4-4 (triaxial method)
NS: Not specified    NA: Not applicable			

[6] Parameter or characteristic	[7] IEC 61196-5 subclause	[8] Manufacturer specification	[9] Minimum requirement
<b>Completed cable tests</b>			
<b>Environmental testing of finished cable</b>	7.3		
Cold bend	7.3.1		No physical damages of conductors, dielectric and sheath
Water penetration	7.3.2		NS
Climatic sequence	7.3.3		Influenced mechanical and electrical characteristics shall be tested and defined
Damp heat (steady state)	7.3.4		Influenced mechanical and electrical characteristics shall be tested. Test report should include the following parameters: a) test temperature, b) relative humidity, c) test duration
Ultraviolet stability of sheath or jacket	7.3.5		No visual cracks – change in elongation $\leq 20$ % after 720 h – change in tensile strength $\leq 20$ % after 720 h
Thermal ageing	7.3.6		Transmission characteristics of 7.2 shall remain within the specified limits (under consideration)
Carbon black content, where applicable	7.3.8		$\geq 2$ % (black PE only) <sup>b</sup>
<b>Mechanical characteristics of finished cable</b>	7.4		
Ovality of outer conductor or screen	7.4.1		$\leq 7$ %
Ovality of sheath	7.4.2		$\leq 7$ %
Eccentricity of dielectric	7.4.3		$\leq 10$ %
Eccentricity of sheath	7.4.4		$\leq 10$ %
Tensile strength and elongation of the copper or copper-clad metals	7.4.5		Shall be in accordance with IEC 61196-1:2005, 4.4.1
Torsion test for copper-clad metals	7.4.6		The surface shall not reveal any irregular seams, pits or slivers of sufficient magnitude or inherent defects.
<b>NS: Not specified    NA: Not applicable</b>			

[6] Parameter or characteristic Completed cable tests	[7] IEC 61196-5 subclause	[8] Manufacturer specification	[9] Minimum requirement
Adhesion testing: inner conductor to dielectric	7.4.7		Unless otherwise specified, pressure force $F_a$ required to remove dielectric shall be 0,1 MPa $\leq F_a \leq 1,0$ MPa.
Single Bending	7.4.8		NS
Multiple Bending	7.4.8		c
Tensile strength of cable (longitudinal pull)	7.4.9		NS
Crush resistance of cable	7.4.10		Load = According to manufacturer's specification. applied for 2 min  After a 2 min recovery time, the maximum impedance irregularity shall be $\leq 1$ %
Abrasion resistance	7.4.11		NS
Fire performance requirements	7.5		As required
<p>a Figures provided give the default values. Other values may be specified.</p> <p>b In some regions, a value of <math>\geq 2,5\%</math> is required for Carbon black content.</p> <p>c Flexure test method be performed per IEC 61196-1-314:2006, 8.3.2, procedure 1.</p> <p>Radius of mandrel: as specified by the manufacturer,</p> <p>Pulling force: as specified by the manufacturer,</p> <p>Speed: <math>\leq 1</math> m/s,</p> <p>Number of cycles: 3.</p>			
NS: Not specified    NA: Not applicable			
[10] Additional tests, methods, and other information			

**Annex A**  
(normative)

**Maximum attenuation**

Frequency specified in MHz	Maximum attenuation: dB/100 m at 20 °C
—	—
—	—
—	—
200	—
—	—
—	—
—	—
800	—
—	—
—	—
1 002	—

## Bibliography

IEC 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 60811-4-1, *Insulating and sheathing materials of electric and optical cables – Common test methods – Part 4-1: Methods specific to polyethylene and polypropylene compounds – Resistance to environmental stress cracking – Measurement of the melt flow index – Carbon black and/or mineral filler content measurement in polyethylene by direct combustion – Measurement of carbon black content by thermogravimetric analysis (TGA) – Assessment of carbon black dispersion in polyethylene using a microscope*

IEC 61196-1-1, *Coaxial communication cables – Part 1-1: Capability approval for coaxial cables*

---







INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

3, rue de Varembé  
PO Box 131  
CH-1211 Geneva 20  
Switzerland

Tel: + 41 22 919 02 11  
Fax: + 41 22 919 03 00  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)