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INTERNATIONAL STANDARD

Coaxial communication cables –
Part 6-4: Detail specification for 75-7 type CATV drop cables

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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COAXIAL COMMUNICATION CABLES –

Part 6-4: Detail specification for 75-7 type CATV drop cables

FOREWORD

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International Standard IEC 61196-6-4 has been prepared by subcommittee 46A: Coaxial cables, of IEC technical committee 46: Cables, wires, waveguides, RF connectors, RF and microwave passive components.

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

FDIS	Report on voting
46A/1354/FDIS	46A/1360/RVD

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

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

This International Standard is to be used in conjunction with IEC 61196-1:2005 and IEC 61196-6:2009.

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 "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- withdrawn,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.

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

COAXIAL COMMUNICATION CABLES –

Part 6-4: Detail specification for 75-7 type CATV drop cables

1 Scope

This part of IEC 61196 applies to coaxial communication cables described in IEC 61196-6. It specifies the requirements for 75-7 type CATV drop cables. These cables are used in CATV distribution systems, surveillance and control systems, satellite television receiving systems and as bidirectional hybrid fibre coax (HFC). The operating frequency is from 5 MHz to 3 000 MHz.

This part of IEC 61196 is to be used in conjunction with IEC 61196-1:2005 and IEC 61196-6:2009. It determines the layout and style with respect to the model and type.

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.

NOTE Documents which are needed to achieve the tests according to Clause 4, item [8] or item [9], respectively, are listed in IEC 61196-6.

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

IEC 61196-1-115, *Coaxial communication cables – Part 1-115: Electrical test methods – Test for regularity of impedance (pulse/step function return loss)*

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

IEC 61196-6:2009, *Coaxial communication cables – Part 6: Sectional specification for CATV drop cables*

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) – Test method for measuring of the screening attenuation as up to and above 3 GHz, triaxial method*

3 Terms and definitions

No terms and definitions are listed in this document.

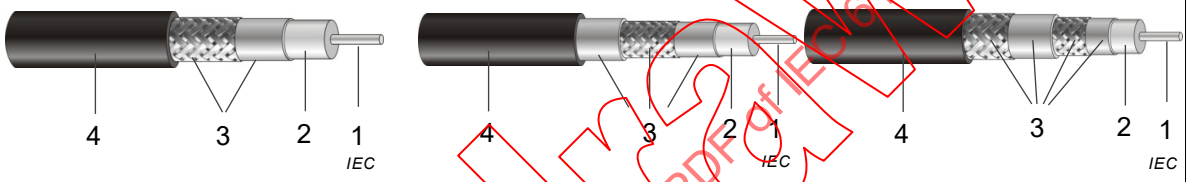
ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

4 Detail specification

COAXIAL COMMUNICATION CABLES – Part 6-4: Detail specification for 75-7 type CATV drop cables			
[1] Prepared by: IEC SC 46A		**[2] Document No.:** IEC 61196-6-4 **Issue:** Edition 1.0 **Date:**	
[3] Available from: IEC	**[4] Generic specification:** IEC 61196-1 **Sectional specification:** IEC 61196-6		
[5] Additional references			
[6] Cable construction			

75-7S (Dual shield) **75-7T (Tri-shield)** **75-7Q (Quad-shield)**



1: Inner conductor 2: Dielectric 3: Shield 4: Sheath or jacket

Variant [a] constructions		**75-7S**	**75-7T**	**75-7Q**
Inner conductor	Material	BC or CCS		
	Diameter (mm)	1,63		
	Tolerance (mm)	± 0,02		
Dielectric	Material	Foamed PE		
	Diameter (mm)	7,11		
	Tolerance (mm)	± 0,15		
Outer conductor or shield	Material	ALT+A or ALT+TC	ALT+A+ALT or ALT+TC+ALT	ALT+A+ALT+A or ALT+TC+ALT+TC
	Inner shield diameter (mm)	7,32		
	Tolerance (mm)	± 0,15		
	Longitudinally overlap (%)	18 – 35		
	Braid coverage (%)	≥ 59	≥ 59	Inner braid ≥ 59 Outer braid ≥ 32
	Maximum outer diameter (mm)	8,30	8,45	9,10

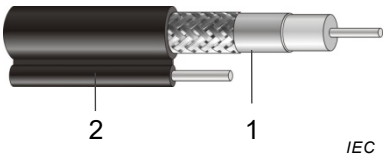
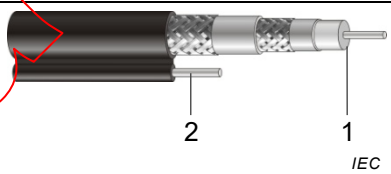
Sheath or jacket	Material	PVC or PE or LSZH		
	Minimum thickness (mm)	0,80	0,73	0,51
	Diameter (mm)	10,16	10,16	10,34
	Tolerance (mm)	± 0,25		

[a] Variants are shown in Annex A.

NOTE:

BC — Bare copper wire
CCS — Copper clad steel wire
ALT — Aluminium-polymeric laminated tape
A — Aluminium alloy wire
TC — Tinned copper wire
PE — Polyethylene
PVC — Polyvinylchloride
LSZH — Low smoke zero halogen polyolefin

Messenger construction (When applicable)

75-7S/M [a] (Dual shield + Messenger)	**75-7T/M (Tri-shield + Messenger)**	**75-7Q/M (Quad-shield + Messenger)**
 1: Dual shield cable 2: Messenger	 1: Tri-shield cable 2: Messenger	 1: Quad-shield cable 2: Messenger

Integral messenger	Material	Zinc coated carbon steel wire		
	Diameter (mm)	1,83 ± 0,05	2,11 ± 0,05	2,77 ± 0,05
	Tensile strength (kgf)	156,9	193,7	320,2
	Minimum elongation (%)	3,0		
	Corrosion properties	NS		

[a] Variants are shown in Annex A.

NOTE Cable constructions of messenger cable are the same as described above cable.

[7] Engineering information (reference only)	
Operating temperature range	−40 °C to 70 °C (PE Sheath) −20 °C to 70 °C (PVC Sheath) −15 °C to 70 °C (LSZH Sheath)
Operating frequency range	5 MHz to 3 000 MHz
Nominal characteristic impedance	75 Ω
Minimum bending radius	10D (D is the nominal cable outer diameter)
Relative propagation velocity	85 % (nominal)
Maximum current carrying capacity	13 A (20 °C); 10 A (40 °C)
Cable identification and marking	See Annex A.

[8] Parameter or characteristic	[9] Subclause of IEC 61196-6	[10] Value	[11] Remarks
Electrical testing of finished cable	7.1		
Low-frequency and d.c. electrical measurements	7.1.1		
Conductor resistance Inner conductor Outer conductor	7.1.1.1	≤ 8,30 Ω/km (BC conductor) ≤ 40,20 Ω/km (CCS conductor) ≤ 30,20 Ω/km (ALT+A) ≤ 14,50 Ω/km (ALT+TC) ≤ 20,80 Ω/km (ALT+A+ALT) ≤ 12,50 Ω/km (ALT+TC+ALT) ≤ 17,00 Ω/km (ALT+A+ALT+A) ≤ 9,00 Ω/km (ALT+TC+ALT+TC)	at 20 °C
Insulation resistance	7.1.1.2	≥ 10 000 MΩ•km	
Withstand voltage of dielectric	7.1.1.3	1,5 kV AC, 1 min	
Withstand voltage of sheath	7.1.1.4	2,5 kV AC, 1 min	
Current carrying capacity	7.1.1.5		see [7]
Spark test	7.1.1.6	2,5 kV AC 50 Hz, or 3 kV AC 15 kHz, or 3.75 kV DC	
High-frequency electrical and transmission measurements	7.1.2		
Characteristic impedance	7.1.2.1	75 Ω ± 3 Ω	measured at 200 MHz
Relative propagation velocity	7.1.2.2		see [7]
Return loss (uniformity of impedance)	7.1.2.3	≥ 20 dB (5 MHz to 1 000 MHz) ≥ 18 dB (1 000 MHz to 2 000 MHz) ≥ 16 dB (1 000 MHz to 3 000 MHz)	The measurement inaccuracy $\Lambda a_{r,f}$ shall be < 1 dB
Attenuation constant, α	7.1.2.4	Not exceed the values specified in Annex B.	at 20 °C
Regularity of impedance	7.1.2.5	≥ 40 dB resp. ≤ 1 %	Perform on both ends of the cable Test procedure: IEC 61196-1-115
Transfer impedance after flex	7.1.2.6	a) Dual shield cable : no more than screening class C: ≤ 50 mΩ/m from 5 MHz to 30 MHz b) Tri-shield cable : no more than screening class B: ≤ 15 mΩ/m from 5 MHz to 30 MHz c) Quad-shield cable : no more than screening class A: ≤ 5 mΩ/m from 5 MHz to 30 MHz	The flexure test according to IEC 61196-1-314:2015, 8.3.3, Procedure 2: a) Radius: 10 × cable diameter b) Tension: 10 N c) Speed: ≤ 1 m/s d) Number of cycles: 3 After flexure test, measure the transfer impedance according to IEC 62153-4-3.

[8] Parameter or characteristic	[9] Subclause of IEC 61196-6	[10] Value	[11] Remarks
Screening attenuation after flex	7.1.2.7	a) Dual shield cable: no less than screening class A: ≥ 85 dB from 30 MHz to 1 000 MHz ≥ 75 dB from 1 000 MHz to 2 000MHz ≥ 65 dB from 2 000 MHz to 3 000 MHz b) Tri-shield cable: no less than screening class A: ≥ 85 dB from 30 MHz to 1 000 MHz ≥ 75 dB from 1 000 MHz to 2 000 MHz ≥ 65 dB from 2 000 MHz to 3 000 MHz c) Quad-shield cable: no less than screening class A+: ≥ 95 dB from 30 MHz to 1 000 MHz ≥ 85 dB from 1 000 MHz to 2 000 MHz ≥ 75 dB from 2 000 MHz to 3 000 MHz	The flexure test according to IEC 61196-1-314:2015, 8.3.3, Procedure 2: a) Radius: 10 × cable diameter b) Tension: 10 N c) Speed: ≤ 1 m/s d) Number of cycles: 3 After flexure test, measure the screening attenuation according to IEC 62153-4-4.
Environmental testing of finished cable	7.2		
Cold bend	7.2.1	No physical damages of sheath	a) Test method: Method B b) Mandrel diameter: 20 × cable diameter c) Test temperature: PE Sheath: −40 °C ± 2 °C PVC Sheath: −20 °C ± 2 °C LSZH Sheath: −15 °C ± 2 °C
Water penetration	7.2.2	Not applicable	
Climatic sequence	7.2.3	a) No physical damages of sheath b) Magnitude of change in attenuation constant is no more than 7 % in Annex B	a) Test temperature: PE sheath: T_A = −40 °C, T_B = 70 °C; PVC sheath: T_A = −20 °C, T_B = 70 °C LSZH sheath: T_A = −15 °C, T_B = 70 °C b) t_1: 24 h c) Number of cycles: 3
Damp heat (steady state)	7.2.4	a) No physical damages of sheath b) Insulation resistance is no less than 10 000 MΩ•km c) Magnitude of change in attenuation constant is no more than 7 % in Annex B	
Ultraviolet stability of sheath or jacket	7.2.5	a) No visual cracks b) Magnitude of change in elongation ≤ 20 % c) Magnitude of change in tensile strength ≤ 20 %	Test times: 720 h

[8] Parameter or characteristic	[9] Subclause of IEC 61196-6	[10] Value	[11] Remarks
Thermal ageing	7.2.6	a) No physical damages of sheath b) Magnitude of change in attenuation constant is no more than 7 % in Annex B	a) Test temperature: 80 °C ± 2 °C b) Test times: 168 h
Mechanical characteristics of finished cable	7.3		
Ovality of dielectric	7.3.1	≤ 5 %	
Ovality of sheath	7.3.2	≤ 7 %	
Eccentricity of dielectric	7.3.3	≤ 10 %	
Eccentricity of sheath	7.3.4	≤ 10 %	
Carbon black content, where applicable	7.3.5	≥ 2 %	Only applicable to PE sheath
Tensile strength and elongation of the copper or copper-clad metals	7.3.6	a) CCS inner conductor Tensile strength: ≥ 792 MPa Elongation: ≥ 1,5 % b) BC inner conductor Tensile strength: Not applicable Elongation: ≥ 25 %	
Torsion test for copper-clad metals	7.3.7	CCS inner conductor shall meet the requirement: After 20 twists, the examination of the surface shall not reveal any seams, pits or slivers of sufficient magnitude inherent defects. After continued twisting the wire to destruction, the examination of the ends shall not reveal any separation between the copper and the metal core wire.	Only applicable to CCS inner conductor
Adhesion testing: Inner conductor to dielectric	7.3.8	67 N – 178 N	a) Test temperature: 20 °C ± 5 °C b) Specimen length: 50 mm
Bending characteristic	7.3.9	a) No physical damage of the sheath b) Screening attenuation shall be ≥ 65 dB (30 MHz to 1 000 MHz)	The bending test according to IEC 61196-1-314:2015, Clause 5: a) Test mandrel radius: 10 × cable diameter b) Number of cycles: 500 c) Test angle: ±90° d) Test temperature: 20 °C ± 5 °C e) Load: 10 N After bending, measure the Screening attenuation according to IEC 62153-4-4.

[8] Parameter or characteristic	[9] Subclause of IEC 61196-6	[10] Value	[11] Remarks
Tensile strength of cable (longitudinal pull)	7.3.10	Not applicable	
Crush resistance of cable	7.3.11	a) No physical damage of the sheath b) After a 2 min recovery time, the maximum impedance irregularity shall be δ 1 %, when measured in accordance with IEC 61196-1-115	a) Test load: 700 N b) Test time: 2 min
Abrasion resistance	7.3.12	Not applicable	

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, for example "75";
- a number that corresponds to the approximate dielectric outer diameter in mm, for example, the nominal dielectric diameter 7,11 mm shall be expressed by "7".

A.1.2 Variants

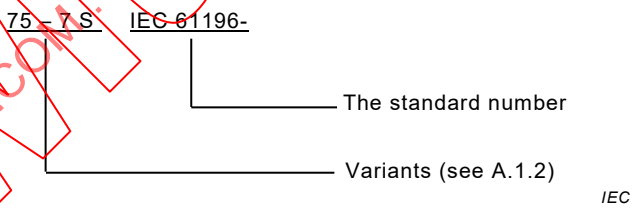
The variant of cables should be identified by the following:

a) Type name: see A.1.1.
b) Construction distinguishing letter:
   S – Standard shield outer conductor
   T – Tri-shield shield outer conductor
   Q – Quad-shield shield outer conductor
   M – Messenger(when applicable)

A.2 Cable marking

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

a) Cable without messenger



b) Cable with messenger