

INTERNATIONAL STANDARD

iTeh STANDARD
Coaxial communication cables –
Part 9-2: Detail specification for 50-0,4 type RF flexible cables
PREVIEW
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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COAXIAL COMMUNICATION CABLES –

Part 9-2: Detail specification for 50-0,4 type RF flexible cables

FOREWORD

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IEC 61196-9-2 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.

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

Draft	Report on voting
46A/1553/FDIS	46A/1558/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/standardsdev/publications.

This part of IEC 61196 is to be used in conjunction with IEC 61196-1:2005 and IEC 61196-9:2014.

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.

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- withdrawn,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.

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COAXIAL COMMUNICATION CABLES –

Part 9-2: Detail specification for 50-0,4 type RF flexible cables

1 Scope

This part of IEC 61196 applies to coaxial communication cables described in IEC 61196-9. It specifies the requirements for 50-0,4 type RF flexible cables. These cables are used in routers, notebook computers, mobile phones or other electronics. The operating frequency is from 5 MHz to 6 000 MHz.

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 61196-9.

IEC 60068-2-20:2021, *Environmental testing – Part 2-20: Tests – Test T: Test methods for solderability and resistance to soldering heat of devices with leads*

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

IEC 61196-9:2014, *Coaxial communication cables – Part 9: Sectional specification for RF flexible cables*

IEC 61196-1-115:2006, *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 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*

IEC 62153-4-5, *Metallic communication cable test methods – Part 4-5: Electromagnetic compatibility (EMC) – Screening or coupling attenuation - Absorbing clamp 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 9-2: Detail specification for 50-0,4 type RF flexible cables									
[1] Prepared by: IEC SC 46A				[2] Document No.: IEC 61196-9-2 Issue: First Date:					
[3] Available from: IEC				[4] Generic specification: IEC 61196-1 Sectional specification: IEC 61196-9					
[5] Additional references									
[6] Cable construction									
50-0,4-XYZ-IEC 61196-9-2 (Braid shield cable)									
 <p style="text-align: center;">IEC</p>									
1 Inner conductor (SPC)		2 Dielectric (Solid FEP or PFA)		3 Braid shield (TC or SPC)		4 Sheath or jacket (FEP or PFA)			
NOTE For abbreviations, see the end of this table.									
Variants ^a		50-0,4-F11		50-0,4-F12		50-0,4-F21		50-0,4-F22	
Constructions		F11		F12		F21		F22	
Inner conductor	Material	SPC				SPC			
	Stranding No. of Strands × diameter (mm)	7 × 0,05				7 × 0,05			
Dielectric	Material	FEP				PFA			
	Diameter (mm)	Nom.0,41				Nom.0,41			
Outer conductor or shield	Material	SC		TC		SC		TC	
	Braid coverage (%)	≥85		≥85		≥85		≥85	
Sheath or jacket	Material	FEP	PFA	FEP	PFA	FEP	PFA	FEP	PFA
	Diameter (mm)	Nom.0,81		Nom.0,81		Nom.0,81		Nom.0,81	
^a Variants are shown in Annex A.									

50-0,4-XYZ-IEC 61196-9-2 (Spiral shield cable)									
1 Inner conductor (SPC)		2 Dielectric (Solid FEP or PFA)		3 Spiral shield (TC or SPC)		4 Sheath or jacket (FEP or PFA)		IEC	
NOTE For abbreviations, see the end of this table.									
Variants ^a		50-0,4-F31	50-0,4-F32	50-0,4-F41	50-0,4-F42	50-0,4-F _k 31	50-0,4-F _k 32	50-0,4-F _k 41	50-0,4-F _k 42
Constructions									
Inner conductor	Material	SPC				SPC			
	Stranding No. of Strands × diameter (mm)	7 × 0,05				7 × 0,05			
Dielectric	Material	FEP				PFA			
	Diameter (mm)	Nom.0,44				Nom.0,44			
Outer conductor or shield	Material	SPC		TC		SPC		TC	
	Wrap coverage (%)	≥85		≥85		≥85		≥85	
Sheath or jacket	Material	FEP	PFA	FEP	PFA	FEP	PFA	FEP	PFA
	Diameter(mm)	Nom.0,64		Nom.0,64		Nom.0,64		Nom.0,64	
NOTE									
SPC – Silver plated copper wire									
TC – Tinned copper wire									
FEP – Fluorinated ethylene propylene									
PFA – Perfluoroalkoxy									
[7] Engineering information (reference only)									
Operating temperature range					-55 °C to 200 °C (SPC shield) -55 °C to 150 °C (TC shield)				
Operating frequency range					5 MHz to 6 000 MHz				
Nominal characteristic impedance					50 Ω				
Minimum bending radius (static state)					5D (<i>D</i> is the nominal cable outer diameter)				
Minimum bending radius (dynamic state)					10D (<i>D</i> is the nominal cable outer diameter)				
Relative propagation velocity					70 % (nominal)				

[8] Parameter or characteristic	[9] IEC 61196-9:2014 Subclause	[10] Value	[11] Remarks
Electrical characteristics	7.1		
Low-frequency and DC electrical measurements	7.1.1		
Continuity	7.1.1.1	Inner conductor and outer conductor shall be continuous	
Conductor resistance – inner	7.1.1.2	$\leq 1,37 \Omega/m$	at 20 °C
Conductor resistance – outer	7.1.1.3	$\leq 0,24 \Omega/m$ (SC braid) $\leq 0,36 \Omega/m$ (SC wrap) $\leq 0,26 \Omega/m$ (TC braid) $\leq 0,39 \Omega/m$ (TC wrap)	at 20 °C
Insulation resistance	7.1.1.4	$\geq 1\,000 \text{ M}\Omega \cdot \text{km}$	
Withstand voltage of dielectric	7.1.1.5	1,5 kV AC or 2,1 kV DC, 1 min	
Withstand voltage of sheath ^a	7.1.1.6	2,5 kV AC or 3,6 kV DC, 1 min	
Spark test (in-process inspection) ^a	7.1.1.7	2,5 kV AC	
Capacitance	7.1.1.8	$\leq 105 \text{ pF/m}$	
High-frequency electrical and transmission measurements	7.1.2		
Characteristic impedance	7.1.2.1	$50 \Omega \pm 2 \Omega$	200 MHz
Relative propagation velocity	7.1.2.2		See [7]
Return loss (uniformity of impedance)	7.1.2.3	$\geq 19,1 \text{ dB}$ (5 MHz to 6 000 MHz) (Braid shield) $\geq 16,5 \text{ dB}$ (5 MHz to 6 000 MHz) (Spiral shield)	The measurement inaccuracy $a_{r,l}$ shall be $< 1 \text{ dB}$
Attenuation constant, α	7.1.2.4	See Annex B	20 °C
Regularity of impedance	7.1.2.5	$\geq 40 \text{ dB}$ resp $\leq 1 \%$	Perform on both ends of tested cable Test procedure: IEC 61196-1-115 (time domain)
PIM	7.1.2.6	NA	
RF power rating	7.1.2.7	NA	
Phase variation with temperature	7.1.2.8	NA	
Phase stability with mechanic	7.1.2.9	NA	
Transfer impedance	7.1.2.10	$\leq 150 \text{ m}\Omega / m$ from 5 MHz to 30 MHz (braid shield)	Test procedure: IEC 62153-4-3
Screening attenuation	7.1.2.11	$\geq 60 \text{ dB}$ from 30 MHz to 6 000 MHz (braid shield)	Test procedure: IEC 62153-4-4