

INTERNATIONAL STANDARD

**Radio frequency and coaxial cable assemblies –
Part 3-1: Blank detail specification for semi-flexible coaxial cable assemblies**



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RADIO FREQUENCY AND COAXIAL CABLE ASSEMBLIES –

Part 3-1: Blank detail specification for semi-flexible coaxial cable assemblies

FOREWORD

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International Standard IEC 60966-3-1 has been prepared by IEC technical committee 46: Cables, wires, waveguides, R.F. connectors, R.F. and microwave passive components and accessories.

This third edition cancels and replaces the second edition published in 2003 and constitutes a technical revision.

The major change with respect to the first edition is the reference to the third edition of the sectional specification.

This blank detail specification is to be read in conjunction with the second edition of IEC 60966-1 (1999) and with the third edition of IEC 60966-3 (2008).

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

FDIS	Report on voting
46/306/FDIS	46/318/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 publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 60966 series, under the general title: *Radio frequency and coaxial cable assemblies*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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- withdrawn,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.

INTRODUCTION

This part of IEC 60966 is a blank detail specification that relates to semi-flexible coaxial cable assemblies operating in the transverse electromagnetic mode (TEM).

The creation of a uniform layout and style of a detail specification is determined by the use of a blank detail specification pro forma. The detail specification may be prepared by the insertion of data into the pro forma by a national standards organization, by an approved manufacturer or by a user (when prepared by a user, the detail specification shall be submitted to the national authorized institution by an approved manufacturer).

Instructions to complete a blank detail specification:

Detail specifications should, as far as possible, be written in accordance with the pro forma which has:

- a front page with a general description and a drawing or isometric sketch of the cable assembly and its possible variants;
- ratings, characteristics and inspection requirements (those which are not required or specified shall be omitted).

Under quality assessment, tests are divided into groups. Whenever possible, entire groups are either specified or omitted.

These groups are:

Ba	(basic)	Visual and dimensional tests
Eb	(electrical basic)	Low-frequency operational tests
Eh	(electrical high frequency)	High-frequency tests
Ep	(electrical phase)	Electrical length tests
Ee	(electrical screening effectiveness)	Screening effectiveness tests
Ez	(electrical impedance Z)	Impedance uniformity tests
Et	(electrical transmission)	Power rating test
Mn	(mechanical)	Mechanical tests
Vc	(environmental climatic)	Climatic tests
Vv	(environmental vibration)	Vibration, bumps and shock tests
Vt	(environmental temperature)	Humidity, rapid change of temperature and chemical tests
Vf	(environmental flammability)	Flammability, dust and water immersion tests

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

- [1] Name and address of the organization that has prepared the document.
- [2] IEC document number, issue number and date of issue.
- [3] Address of the organization from which the document is available.
- [4] Related documents.
- [5] Any other reference to the cable assembly, national reference, trade name, etc.
- [6] A drawing of the cable assembly giving the outline and principal dimensions. The dimensions are considered to be in millimetres unless otherwise specified.
NOTE The symbol "l" may be used to specify the cable length. In this case, the detail specification covers cable assemblies of any length and "l" should then be specified in the order.
- [7] Nominal characteristic impedance of the cable assembly.
- [8] Frequency range of use of the cable assembly (DC may be used as a lower limit of frequency, indicating that the cable assembly is capable of transmitting d.c., but at d.c. a number of characteristics may neither apply nor be verified by inspection.)
- [9] Weight, function of the length of the cable assembly.
- [10] Minimum static inside bending radius of the cable assembly. Also minimum dynamic inside bending radius of the cable assembly, i.e. the bending radius used for the insertion loss and stability of electrical length tests.
- [11] Climatic category of the cable assembly related to IEC 60068.
- [12] The applicable quality assessment test groups according to Table 1 of the sectional specification (for example, Ba, Eh, Eb).
- [13] Description, of the components used for the manufacture of the cable assembly. When the components do not conform with the relevant publication(s), their relevant materials requirements shall be listed.
- [14] Variants of the cable assembly may be listed in one detail specification. The variants may differ by colour, connector material, connector sex or type. (Inspection for quality conformance will be the same for all variants whereas the ratings and characteristics can change.)
- [15] Number of pages of the blank detail specification including the annexes.
- [16] Ratings and characteristics of the cable assembly. The properties not specified should be omitted.
- [17] Reference to the appropriate subclause in the sectional and generic specifications.
- [18] The value either guaranteed or used for the defined test.
- [19] All information required by the sectional specification and any remarks considered as important for understanding the test.
- [20] Test groups (corresponding to box [12] on page 1 of the blank detail specification).
- [21] Name of test and its subclause number in the sectional and generic specifications.
- [22] Periodicity of the test. The periodic tests apply only in the case of qualification approval.
- [23] Inspection level selected from IEC 60410.

- [24] Acceptable quality level selected from IEC 60410.
- [25] Sample size.
- [26] Acceptance criteria.
- [27] Test specimen length should be specified if the length is different from that given in box [6] on page 1 of the blank detail specification or if the length in box [6] is left free with the parameter "l".


Reference documents

IEC 60068 (all parts), *Environmental testing*

IEC 60410, *Sampling plans and procedures for inspection by attributes*

RADIO FREQUENCY AND COAXIAL CABLE ASSEMBLIES –

Part 3-1: Blank detail specification for semi-flexible coaxial cable assemblies

[1] Prepared by:	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">  </div> <div> [2] Document No.: Issue: Date: </div> </div>
[3] Available from:	[4] Generic specification: IEC 60966-1 Sectional specification: IEC 60966-3 Blank detail specification: IEC 60966-3-1
[5] Additional references:	
Detail specification for a semi-flexible coaxial cable assembly NOTE Example diagram, manufacturer to insert actual diagram	
[6]	
[7] Characteristic impedance: Ω	[8] Frequency range: to GHz
[9] Weight: g+ g/m	[10] Minimum inside radius for static bending: mm for dynamic bending: mm
[11] Climatic category: .../.../...	[12] Applicable test groups: Ba, Eh, Eb, Ez, Ep, Ee, Mn, Vv, Vc, Vt, Vf.
[13] Connector reference number Series type sex of the connector Reference no. type of the cable Additional armour Marking method Marking text	
[14] Variants:	
<div style="text-align: right;">[15] Page 1 of 7 pages</div>	

[16] Inspection values, ratings or characteristics	[17] Subclause ^a	[18] Value	[19] Remarks
Electrical*			
Reflection properties	8.1	> dB	..... to GHz From one or two ends
Uniformity of impedance	8.2	.... ± .... Ω	Rise time of pulse <ps
Insertion loss	8.3	≥ dB dB/m	..... to GHz
Propagation time	8.5	.... ns ± ns/m	Frequency or rise time
Stability of electrical length	8.6	..... /GHz	..... to GHz mandrel radius Test method 1 or 2 for bending test
Phase difference	8.7	+ /GHz	Frequency
Phase variation with temperature	8.8	.... /GHz	..... to K to GHz
Screening effectiveness	8.9	≤ dB	..... to MHz
Voltage proof	8.10	≥ kV	
Insulation resistance	8.11	≥ MΩ	Test voltage V
Inner and outer conductor continuity	8.12	OK/no	Voltage Current Frequency
Power rating	8.14	≥ W	
Mechanical*			
Tensile	9.1	Interface OK/no	Force N Duration s Return loss dB
Cable assembly crushing	9.4	Interface OK/no	Force N Return loss dB
Torque	9.5	Interface OK/no	≥..... Nm Return loss
Multiple bending	9.6	Interface OK/no	Cycle Return loss dB

[16] Inspection values, ratings or characteristics	[17] Subclause^a	[18] Value	[19] Remarks
Environmental*			
Vibration	10.2	OK/no	..... m/s ² to Hz g (see also 10.2.1.3)
Bumps	10.2	OK/no	..... m/s ² g
Shock	10.2	OK/no	..... m/s ² ½ sine ns g
Climatic sequence	10.3	.... / .... / ....	Cycles (connectors (un-)mated Tests: 7.2, 8.3, 8.10, 8.11
Damp heat, steady state	10.4	OK/no	Cycles Days (connectors (un-)mated Tests:
Rapid change of temperature	10.5	OK/no	– K/+ K Cycles Tests: 7.2, 8.3, 8.10, 8.11
Solvents and contaminating fluids	10.6	OK/no	Cycles (connectors (un-) mated Tests: 7.2, 8.3, 8.11
Water immersion	10.7	OK/no	
Salt mist and sulphur dioxide	10.8	OK/no	
Dust tests	10.9	OK/no	
Flammability	10.10	OK/no	
<p>* If appropriate, values may be given for each variant.</p> <p>^a The relevant standard could be the generic, the sectional or both of them.</p>			

Grouping of tests for specification purposes

Recommended grouping of tests			Recommended severities					[27] Specimen length
[20] Group	[21] Subclause ^a	Tests	[22] Periodicity	[23] IL	[24] AQL	[25] n	[26] c	
Ba	7.2	Visual inspection						
	7.3	Dimensional inspection						
Eh	8.1	Reflection properties						
	8.3	Insertion loss						
Eb	8.10	Voltage proof						
	8.11	Insulation resistance						
	8.12	Inner and outer conductor continuity						
Ez	8.2	Uniformity of impedance						
Ep	8.5	Propagation time						
	8.6	Stability of electrical length						
	8.7	Phase difference						
	8.8	Phase variation with temperature						
Ee	8.9	Screening effectiveness						
Et	8.14	Power rating						
Mn	9.1	Tensile						
	9.4	Cable assembly crushing						
	9.5	Torque						
	9.6	Multiple bending						
Vv	10.2	Vibration, bumps and shock						
Vc	10.3	Climatic sequence						
Vt	10.4	Damp heat, steady state						
	10.5	Rapid change of temperature						
	10.8	Salt mist and sulphur dioxide						
Vf	10.7	Water immersion						
	10.9	Dust tests						
	10.10	Flammability						
The periodic tests above apply only in the case of qualification approval. In the case of capability approval, the tests may be performed on the applicable CQCs (capability qualification components) instead.								
^a The relevant standard could be the generic, the sectional or both of them.								

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