

REDLINE VERSION



Radio frequency and coaxial cable assemblies – Part 1: Generic specification – General requirements and test methods

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.120.10

ISBN 978-2-8322-6560-4

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CONTENTS

FOREWORD.....	7
1 Scope.....	9
2 Normative references	9
3 Terms and definitions	9
4 Design and manufacturing requirements.....	13
4.1 Cable design and construction	13
4.2 Connector design and construction	13
4.3 Outline and interface dimensions	13
5 Workmanship, marking and packaging.....	13
5.1 Workmanship	13
5.2 Marking.....	14
5.3 End caps.....	14
5.4 Packaging and labelling	14
6 Quality assessment management	14
7 Test methods – General	14
7.1 Standard atmospheric conditions for testing.....	14
7.2 Visual inspection.....	15
7.3 Dimensions inspection	15
7.3.1 Interface dimensions	15
7.3.2 Outline dimensions	15
8 Electrical tests.....	15
8.1 Reflection properties.....	15
8.1.1 Object.....	15
8.1.2 Test equipment	15
8.1.3 Procedure.....	16
8.1.4 Requirements	16
8.1.5 Information to be given in the detail specification.....	16
8.2 Uniformity of impedance	17
8.2.1 Object.....	17
8.2.2 Procedure.....	17
8.2.3 Requirements	17
8.2.4 Information to be given in the detail specification.....	17
8.3 Insertion loss	17
8.3.1 Procedure.....	17
8.3.2 Requirements	17
8.3.3 Information to be given in the detail specification.....	17
8.4 Insertion loss stability	17
8.4.1 Object.....	17
8.4.2 Procedure.....	17
8.4.3 Requirements	17
8.4.4 Information to be given in the detail specification.....	17
8.5 Propagation time.....	18
8.5.1 Procedure.....	18
8.5.2 Requirements	18
8.5.3 Information to be given in the detail specification.....	18

8.6	Stability of electrical length	18
8.6.1	Object.....	18
8.6.2	Procedures	18
8.6.3	Requirements	21
8.6.4	Information to be given in the detail specification	22
8.7	Phase difference	22
8.7.1	Object.....	22
8.7.2	Procedure.....	22
8.7.3	Requirements	22
8.7.4	Information to be given in the detail specification	22
8.8	Phase variation with temperature	22
8.8.1	Object.....	22
8.8.2	Procedure.....	22
8.8.3	Requirements	22
8.8.4	Information to be given in the detail specification	22
8.9	Screening effectiveness	23
8.9.1	Transfer impedance	23
8.9.2	Screening attenuation	23
8.10	Voltage proof	23
8.10.1	Procedure.....	23
8.10.2	Requirements	23
8.10.3	Information to be given in the detail specification	23
8.11	Insulation resistance	24
8.11.1	Procedure.....	24
8.11.2	Requirements	24
8.11.3	Information to be given in the detail specification	24
8.12	Inner and outer conductor continuity	24
8.12.1	Object.....	24
8.12.2	Procedure.....	24
8.12.3	Requirements	24
8.12.4	Information to be given in the detail specification	24
8.13	Power rating	24
8.13.1	Object.....	24
8.13.2	Procedure.....	25
8.13.3	Requirements	25
8.13.4	Information to be given in the detail specification	25
8.14	Intermodulation level measurement.....	25
8.14.1	Procedure.....	25
8.14.2	Requirements	25
8.14.3	Information to be given in the detail specification	25
9	Mechanical robustness tests.....	25
9.1	Tensile.....	25
9.1.1	Object.....	25
9.1.2	Procedure.....	26
9.1.3	Requirements	26
9.1.4	Information to be given in the detail specification	26
9.2	Flexure	26
9.2.1	Object.....	26
9.2.2	Procedure.....	26

9.2.3	Requirements	27
9.2.4	Information to be given in the detail specification.....	27
9.3	Flexing endurance	27
9.3.1	Object.....	27
9.3.2	Procedure.....	27
9.3.3	Requirements	28
9.3.4	Information to be given in the detail specification.....	28
9.4	Cable assembly crushing	28
9.4.1	Object.....	28
9.4.2	Procedure.....	28
9.4.3	Requirements	29
9.4.4	Information to be given in the detail specification.....	29
9.5	Torque	30
9.5.1	Procedure.....	30
9.5.2	Requirements	30
9.5.3	Information to be given in the detail specification.....	30
9.6	Multiple bending.....	30
9.6.1	Object.....	30
9.6.2	Procedure.....	30
9.6.3	Requirements	31
9.6.4	Information to be given in the detail specification.....	31
9.7	Abrasion test of cable assembly.....	31
9.7.1	Object.....	31
9.7.2	Procedure.....	31
9.8	Vibrations, shocks.....	31
9.9	Impact test.....	31
9.10	Mechanical endurance	31
10	Environmental tests	32
10.1	Recommended severities	32
10.2	Vibration, bumps and shock	32
10.3	Climatic sequence.....	32
10.3.1	Procedure.....	32
10.3.2	Requirements	32
10.3.3	Information to be given in the detail specification.....	32
10.4	Damp heat, steady state	32
10.4.1	Procedure.....	32
10.4.2	Requirements	32
10.4.3	Information to be given in the detail specification.....	33
10.5	Rapid change of temperature	33
10.5.1	Procedure.....	33
10.5.2	Requirements	33
10.5.3	Information to be given in the detail specification.....	33
10.6	Resistance to solvents and contaminating fluids	33
10.6.1	Procedure.....	33
10.6.2	Requirements	33
10.6.3	Information to be given in the detail specification.....	34
10.7	Water immersion.....	34
10.7.1	Procedure.....	34
10.7.2	Requirements	34

10.7.3	Information to be given in the detail specification	34
10.8	Salt mist and sulphur dioxide tests	34
10.8.1	Procedure	34
10.8.2	Requirements	34
10.8.3	Information to be given in the detail specification	34
10.9	Dust tests	34
10.9.1	Object	34
10.9.2	Procedure	35
10.9.3	Requirements	35
10.9.4	Information to be given in the detail specification	35
10.10	Flammability	36
10.10.1	Procedure	36
10.10.2	Requirements	36
10.10.3	Information to be given in the detail specification	37
11	Specialized test methods	37
12	Test schedules	37
Annex A (normative)	Test methods for insertion loss determination	38
A.1	Purpose	38
A.2	Test methods	38
A.2.1	General	38
A.2.2	Test method 1	38
A.2.3	Test method 2	39
A.2.4	Test method 3	41
A.3	Correction for characteristic impedance differences	42
Annex B (informative)	Measuring methods for propagation time	44
B.1	Introduction General	44
B.2	Resonance method for propagation time measurement	44
B.3	Time domain method for propagation time measurement	45
Annex C (informative)	Measurement method for screening effectiveness	46
C.1	Introduction	46
C.2	Test method	46
Annex C (informative)	Recommended severities for environmental tests	46
C.1	Introduction to the relationship between environmental conditions and severities of testing	49
C.1.1	General	49
C.1.2	Environmental conditions	49
C.1.3	Environmental testing	49
C.2	Recommended severities for environmental tests	50
C.2.1	Vibration	50
C.2.2	Bump	51
C.2.3	Shock	51
C.2.4	Climatic sequence	51
C.2.5	Damp heat, steady state	52
C.2.6	Rapid change of temperature	52
C.2.7	Salt mist	52
C.2.8	Sulphur dioxide test	52
C.2.9	Dust test	52
Annex D (normative)	Quality assessment management	53

D.1	Introduction General	53
D.2	Object	53
D.3	General Basic aspects	53
D.3.1	Related documents	53
D.3.2	Standards and preferred values	53
D.3.3	Marking of the cable assembly and packaging (see 5.2)	53
D.3.4	Terminology	54
D.4	Quality assessment management procedures	54
D.4.1	Procedures for qualification approval	54
D.4.2	Procedures for capability approval	55
D.4.3	Quality conformance inspection	56
D.5	Capability manual and approval	57
D.5.1	Responsibilities	57
D.5.2	Contents of the capability manual	57
D.5.3	Criteria for capability limits	58
	Bibliography	61
	Figure – Dust measuring device	
	Figure 1 – Bending test: U shape assembly	19
	Figure 2 – Bending test: straight assembly	20
	Figure 3 – Twisting test: U shape assembly	21
	Figure 4 – Fixture for cable assembly flexure test	27
	Figure 5 – Apparatus for cable assembly flexing endurance test	28
	Figure 6 – Fixture for cable crushing test	29
	Figure 7 – Example of test fixture for torque	30
	Figure 8 – Multiple bending test	31
	Figure A.1 – Circuit for the determination of insertion loss	38
	Figure A.2 – Circuit for the determination of insertion loss – principle	40
	Figure A.3 – Alternative circuit for the determination of insertion loss	40
	Figure A.4 – Double-pass circuit for the determination of insertion loss	41
	Figure B.1 – Arrangement of test equipment	44
	Figure C.1 – Description of action needed for the preparation of the environmental test specification	50
	Table 1 – Standard range of atmospheric conditions	14
	Table C.1 – Relationship between displacement and acceleration	51
	Table C.2 – Relationship between peak acceleration and velocity change	51
	Table D.1 – Example of capability limits for cable assemblies	59
	Table D.2 – Example of capability limits for flexible cables	59
	Table D.3 – Example of capability limits for connectors	59
	Table D.4 – Example of flow chart (see D.5.2.5)	60

INTERNATIONAL ELECTROTECHNICAL COMMISSION

RADIO FREQUENCY AND COAXIAL CABLE ASSEMBLIES –

Part 1: Generic specification – General requirements and test methods

FOREWORD

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This Redline version provides you with a quick and easy way to compare all the changes between this standard and its previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

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

This third edition cancels and replaces the second edition published in 1999. This edition constitutes a technical revision.

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

- a) Annex C (informative) Measurement method for screening effectiveness was cancelled;
- b) Subclause 8.9 gives references to relevant test procedures.

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

FDIS	Report on voting
46/700A/FDIS	46/704/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.

A list of all parts in the IEC 60966 series, published 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 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.

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RADIO FREQUENCY AND COAXIAL CABLE ASSEMBLIES –

Part 1: Generic specification – General requirements and test methods

1 Scope

This part of IEC 60966 specifies requirements for radio frequency coaxial cable assemblies operating in the transverse electromagnetic mode (TEM) and establishes general requirements for testing the electrical, mechanical and environmental properties of radio frequency coaxial cable assemblies composed of cables and connectors. Additional requirements relating to specific families of cable assemblies are given in the relevant sectional specifications.

NOTE The design of the cables and connectors used ~~should~~ will preferably conform to the applicable parts of IEC 61196 and IEC 61169 respectively.

NOTE 1 This document does not include tests which are normally performed on the cables and connectors separately. These tests are described in IEC 61196-1 (all parts) and IEC 61169-1 respectively.

NOTE 2 Wherever possible, cables and connectors used in cable assemblies, even if they are not described in the IEC 61196 or IEC 61169 series, are tested separately according to the tests given in the relevant generic specification.

NOTE 3 Where additional protection is applied to a cable assembly, the mechanical and environmental tests described in this document are applicable.

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 60068 (all parts), *Environmental testing*

~~IEC 60068-2-3:1969, Environmental testing – Part 2: Tests – Test Ca: Damp heat, steady state~~

IEC 60068-2-6:1995, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-11:1981, *Basic environmental testing procedures – Part 2-11: Tests – Test Ka: Salt mist*

IEC 60068-2-14:1984, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-27:1987, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

~~IEC 60068-2-29:1987, Environmental testing – Part 2: Tests – Test Eb and guidance: Bump~~

IEC 60068-2-42:1982, *Environmental testing – Part 2-42: Tests – Test Kc: Sulphur dioxide test for contacts and connections*

IEC 60068-2-68:1994, *Environmental testing – Part 2-68: Tests – Test L: Dust and sand*

IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

~~IEC 60096-1:1986, Radio-frequency cables – Part 1: General requirements and measuring methods~~

~~IEC 60332-1:1993, Tests on electric cables under fire conditions – Part 1: Test on a single vertical insulated wire or cable~~

IEC 60332-1-2:2004, *Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame*

~~IEC 60339 (all parts), General-purpose rigid coaxial transmission lines and their associated flange connectors~~

~~IEC 60512-5:1992, Electromechanical components for electronic equipment, basic testing procedures and measuring methods – Part 5: Impact tests (free components), static load tests (fixed components), endurance tests and overload tests~~

IEC 60512-6-2, *Connectors for electronic equipment – Tests and measurements – Part 6-2: Dynamic stress tests – Test 6b: Bump*

IEC 60512-7-2, *Connectors for electronic equipment – Tests and measurements – Part 7-2: Impact tests (free components) – Test 7b: Mechanical strength impact*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60966-2 (all parts), *Radio frequency and coaxial cable assemblies*

IEC 60966-3 (all parts), *Radio frequency and coaxial cable assemblies*

IEC 60966-4 (all parts), *Radio frequency and coaxial cable assemblies*

IEC 61169 (all parts), *Radio-frequency connectors*

IEC 61169-1:1992 2013, *Radio-frequency connectors – Part 1: Generic specification – General requirements and measuring methods*

IEC 61196 (all parts), *Coaxial communication cables*

~~IEC 61196-1:1995, Radio-frequency cables – Part 1: Generic specification – General definitions, requirements and test methods~~

IEC 61196-1-119, *Coaxial communication cables – Part 1-119: Electrical test methods – RF power rating*

~~IEC 61726:1995, Cable assemblies, cables, connectors and passive microwave components – Screening attenuation measurement by the reverberation chamber method~~

IEC 62037-2, *Passive RF and microwave devices, intermodulation level measurement – Part 2: Measurement of passive intermodulation in coaxial cable assemblies*

IEC 62153-4-6, *Metallic cables and other passive components test methods – Part 4-6: Electromagnetic compatibility (EMC) – Surface transfer impedance – Line injection method*

IEC 62153-4-7:2015, *Metallic communication cable test methods – Part 4-7: Electromagnetic compatibility (EMC) – Test method for measuring of transfer impedance Z_T and screening attenuation a_s or coupling attenuation a_C of connectors and assemblies up to and above 3 GHz – Triaxial tube in tube method*

~~IEC QC 001002:1986, Rules of procedure of the IEC quality assessment system for electronic components (IECQ)~~

~~ISO 9000, Quality management and quality assurance standards~~

~~ISO 9001:1994, Quality systems — Model for quality assurance in design, development, production, installation and servicing~~

~~ISO 9002:1994, Quality systems — Model for quality assurance in production, installation and servicing~~

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Radio frequency and coaxial cable assemblies –
Part 1: Generic specification – General requirements and test methods**

**Cordons coaxiaux et cordons pour fréquences radioélectriques –
Partie 1: Spécification générique – Exigences générales et méthodes d'essai**

CONTENTS

FOREWORD.....	7
1 Scope.....	9
2 Normative references	9
3 Terms and definitions	10
4 Design and manufacturing requirements.....	12
4.1 Cable design and construction	12
4.2 Connector design and construction	12
4.3 Outline and interface dimensions	13
5 Workmanship, marking and packaging.....	13
5.1 Workmanship	13
5.2 Marking.....	13
5.3 End caps.....	13
5.4 Packaging and labelling	13
6 Quality management.....	13
7 Test methods – General	13
7.1 Standard atmospheric conditions for testing.....	13
7.2 Visual inspection.....	14
7.3 Dimensions inspection	14
7.3.1 Interface dimensions	14
7.3.2 Outline dimensions	14
8 Electrical tests.....	15
8.1 Reflection properties.....	15
8.1.1 Object.....	15
8.1.2 Test equipment.....	15
8.1.3 Procedure.....	15
8.1.4 Requirements	16
8.1.5 Information to be given in the detail specification.....	16
8.2 Uniformity of impedance	16
8.2.1 Object.....	16
8.2.2 Procedure.....	16
8.2.3 Requirements	16
8.2.4 Information to be given in the detail specification.....	16
8.3 Insertion loss	16
8.3.1 Procedure.....	16
8.3.2 Requirements	16
8.3.3 Information to be given in the detail specification.....	16
8.4 Insertion loss stability	17
8.4.1 Object.....	17
8.4.2 Procedure.....	17
8.4.3 Requirements	17
8.4.4 Information to be given in the detail specification.....	17
8.5 Propagation time.....	17
8.5.1 Procedure.....	17
8.5.2 Requirements	17
8.5.3 Information to be given in the detail specification.....	17

8.6	Stability of electrical length	17
8.6.1	Object.....	17
8.6.2	Procedures	17
8.6.3	Requirements	19
8.6.4	Information to be given in the detail specification	19
8.7	Phase difference	19
8.7.1	Object.....	19
8.7.2	Procedure.....	19
8.7.3	Requirements	19
8.7.4	Information to be given in the detail specification	20
8.8	Phase variation with temperature	20
8.8.1	Object.....	20
8.8.2	Procedure.....	20
8.8.3	Requirements	20
8.8.4	Information to be given in the detail specification	20
8.9	Screening effectiveness	20
8.9.1	Transfer impedance	20
8.9.2	Screening attenuation	20
8.10	Voltage proof	21
8.10.1	Procedure.....	21
8.10.2	Requirements	21
8.10.3	Information to be given in the detail specification	21
8.11	Insulation resistance	21
8.11.1	Procedure.....	21
8.11.2	Requirements	21
8.11.3	Information to be given in the detail specification	21
8.12	Inner and outer conductor continuity	22
8.12.1	Object.....	22
8.12.2	Procedure.....	22
8.12.3	Requirements	22
8.12.4	Information to be given in the detail specification	22
8.13	Power rating	22
8.13.1	Object.....	22
8.13.2	Procedure.....	22
8.13.3	Requirements	22
8.13.4	Information to be given in the detail specification	22
8.14	Intermodulation level measurement.....	23
8.14.1	Procedure.....	23
8.14.2	Requirements	23
8.14.3	Information to be given in the detail specification	23
9	Mechanical robustness tests.....	23
9.1	Tensile.....	23
9.1.1	Object.....	23
9.1.2	Procedure.....	23
9.1.3	Requirements	23
9.1.4	Information to be given in the detail specification	23
9.2	Flexure	24
9.2.1	Object.....	24
9.2.2	Procedure.....	24

9.2.3	Requirements	24
9.2.4	Information to be given in the detail specification	24
9.3	Flexing endurance	24
9.3.1	Object.....	24
9.3.2	Procedure.....	25
9.3.3	Requirements	25
9.3.4	Information to be given in the detail specification	25
9.4	Cable assembly crushing	25
9.4.1	Object.....	25
9.4.2	Procedure.....	25
9.4.3	Requirements	26
9.4.4	Information to be given in the detail specification	26
9.5	Torque	26
9.5.1	Procedure.....	26
9.5.2	Requirements	27
9.5.3	Information to be given in the detail specification	27
9.6	Multiple bending.....	27
9.6.1	Object.....	27
9.6.2	Procedure.....	27
9.6.3	Requirements	28
9.6.4	Information to be given in the detail specification	28
9.7	Abrasion test of cable assembly.....	28
9.7.1	Object.....	28
9.7.2	Procedure.....	28
9.8	Vibrations, shocks.....	28
9.9	Impact test.....	28
9.10	Mechanical endurance	28
10	Environmental tests	29
10.1	Recommended severities	29
10.2	Vibration, bumps and shock	29
10.3	Climatic sequence.....	29
10.3.1	Procedure.....	29
10.3.2	Requirements	29
10.3.3	Information to be given in the detail specification	29
10.4	Damp heat, steady state	29
10.4.1	Procedure.....	29
10.4.2	Requirements	29
10.4.3	Information to be given in the detail specification	30
10.5	Rapid change of temperature	30
10.5.1	Procedure.....	30
10.5.2	Requirements	30
10.5.3	Information to be given in the detail specification	30
10.6	Resistance to solvents and contaminating fluids	30
10.6.1	Procedure.....	30
10.6.2	Requirements	30
10.6.3	Information to be given in the detail specification	31
10.7	Water immersion.....	31
10.7.1	Procedure.....	31
10.7.2	Requirements	31

10.7.3	Information to be given in the detail specification	31
10.8	Salt mist and sulphur dioxide tests	31
10.8.1	Procedure	31
10.8.2	Requirements	31
10.8.3	Information to be given in the detail specification	31
10.9	Dust tests	31
10.9.1	Object	31
10.9.2	Procedure	31
10.9.3	Requirements	32
10.9.4	Information to be given in the detail specification	32
10.10	Flammability	32
10.10.1	Procedure	32
10.10.2	Requirements	32
10.10.3	Information to be given in the detail specification	32
11	Specialized test methods	32
12	Test schedules	32
Annex A (normative)	Test methods for insertion loss determination	33
A.1	Purpose	33
A.2	Test methods	33
A.2.1	General	33
A.2.2	Test method 1	33
A.2.3	Test method 2	34
A.2.4	Test method 3	36
A.3	Correction for characteristic impedance differences	37
Annex B (informative)	Measuring methods for propagation time	39
B.1	General	39
B.2	Resonance method for propagation time measurement	39
B.3	Time domain method for propagation time measurement	40
Annex C (informative)	Recommended severities for environmental tests	41
C.1	Introduction to the relationship between environmental conditions and severities of testing	41
C.1.1	General	41
C.1.2	Environmental conditions	41
C.1.3	Environmental testing	41
C.2	Recommended severities for environmental tests	42
C.2.1	Vibration	42
C.2.2	Bump	43
C.2.3	Shock	43
C.2.4	Climatic sequence	43
C.2.5	Damp heat, steady state	44
C.2.6	Rapid change of temperature	44
C.2.7	Salt mist	44
C.2.8	Sulphur dioxide test	44
C.2.9	Dust test	44
Annex D (normative)	Quality management	45
D.1	General	45
D.2	Object	45
D.3	Basic aspects	45

D.3.1	Related documents	45
D.3.2	Standards and preferred values	45
D.3.3	Marking of the cable assembly and packaging (see 5.2)	45
D.3.4	Terminology.....	46
D.4	Quality management procedures.....	46
D.4.1	Procedures for qualification approval	46
D.4.2	Procedures for capability approval	47
D.4.3	Quality conformance inspection	48
D.5	Capability manual and approval	49
D.5.1	Responsibilities	49
D.5.2	Contents of the capability manual	49
D.5.3	Criteria for capability limits	50
Bibliography.....		53
Figure 1 – Bending test: U shape assembly		18
Figure 2 – Bending test: straight assembly.....		18
Figure 3 – Twisting test: U shape assembly		19
Figure 4 – Fixture for cable assembly flexure test		24
Figure 5 – Apparatus for cable assembly flexing endurance test		25
Figure 6 – Fixture for cable crushing test		26
Figure 7 – Example of test fixture for torque		27
Figure 8 – Multiple bending test		28
Figure A.1 – Circuit for the determination of insertion loss		33
Figure A.2 – Circuit for the determination of insertion loss – principle		35
Figure A.3 – Alternative circuit for the determination of insertion loss		35
Figure A.4 – Double-pass circuit for the determination of insertion loss.....		36
Figure B.1 – Arrangement of test equipment		39
Figure C.1 – Description of action needed for the preparation of the environmental test specification.....		42
Table 1 – Standard range of atmospheric conditions		14
Table C.1 – Relationship between displacement and acceleration.....		43
Table C.2 – Relationship between peak acceleration and velocity change.....		43
Table D.1 – Example of capability limits for cable assemblies		51
Table D.2 – Example of capability limits for flexible cables.....		51
Table D.3 – Example of capability limits for connectors.....		51
Table D.4 – Example of flow chart (see D.5.2.5)		52

INTERNATIONAL ELECTROTECHNICAL COMMISSION

RADIO FREQUENCY AND COAXIAL CABLE ASSEMBLIES –**Part 1: Generic specification – General requirements and test methods**

FOREWORD

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

This third edition cancels and replaces the second edition published in 1999. This edition constitutes a technical revision.

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

- a) Annex C (informative) Measurement method for screening effectiveness was cancelled;
- b) Subclause 8.9 gives references to relevant test procedures.

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

FDIS	Report on voting
46/700A/FDIS	46/704/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.

A list of all parts in the IEC 60966 series, published 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 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
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RADIO FREQUENCY AND COAXIAL CABLE ASSEMBLIES –

Part 1: Generic specification – General requirements and test methods

1 Scope

This part of IEC 60966 specifies requirements for radio frequency coaxial cable assemblies operating in the transverse electromagnetic mode (TEM) and establishes general requirements for testing the electrical, mechanical and environmental properties of radio frequency coaxial cable assemblies composed of cables and connectors. Additional requirements relating to specific families of cable assemblies are given in the relevant sectional specifications.

The design of the cables and connectors used will preferably conform to the applicable parts of IEC 61196 and IEC 61169 respectively.

NOTE 1 This document does not include tests which are normally performed on the cables and connectors separately. These tests are described in IEC 61196-1 (all parts) and IEC 61169-1 respectively.

NOTE 2 Wherever possible, cables and connectors used in cable assemblies, even if they are not described in the IEC 61196 or IEC 61169 series, are tested separately according to the tests given in the relevant generic specification.

NOTE 3 Where additional protection is applied to a cable assembly, the mechanical and environmental tests described in this document are applicable.

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 60068 (all parts), *Environmental testing*

IEC 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-11, *Basic environmental testing procedures – Part 2-11: Tests – Test Ka: Salt mist*

IEC 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-27, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-42, *Environmental testing – Part 2-42: Tests – Test Kc: Sulphur dioxide test for contacts and connections*

IEC 60068-2-68, *Environmental testing – Part 2-68: Tests – Test L: Dust and sand*

IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60332-1-2:2004, *Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame*

IEC 60512-6-2, *Connectors for electronic equipment – Tests and measurements – Part 6-2: Dynamic stress tests – Test 6b: Bump*

IEC 60512-7-2, *Connectors for electronic equipment – Tests and measurements – Part 7-2: Impact tests (free components) – Test 7b: Mechanical strength impact*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60966-2 (all parts), *Radio frequency and coaxial cable assemblies*

IEC 60966-3 (all parts), *Radio frequency and coaxial cable assemblies*

IEC 60966-4 (all parts), *Radio frequency and coaxial cable assemblies*

IEC 61169 (all parts), *Radio-frequency connectors*

IEC 61169-1:2013, *Radio-frequency connectors – Part 1: Generic specification – General requirements and measuring methods*

IEC 61196 (all parts), *Coaxial communication cables*

IEC 61196-1-119, *Coaxial communication cables – Part 1-119: Electrical test methods – RF power rating*

IEC 62037-2, *Passive RF and microwave devices, intermodulation level measurement – Part 2: Measurement of passive intermodulation in coaxial cable assemblies*

IEC 62153-4-6, *Metallic cables and other passive components test methods – Part 4-6: Electromagnetic compatibility (EMC) – Surface transfer impedance – Line injection method*

IEC 62153-4-7:2015, *Metallic communication cable test methods – Part 4-7: Electromagnetic compatibility (EMC) – Test method for measuring of transfer impedance Z_T and screening attenuation a_s or coupling attenuation a_C of connectors and assemblies up to and above 3 GHz – Triaxial tube in tube method*

SOMMAIRE

AVANT-PROPOS	59
1 Domaine d'application	61
2 Références normatives	61
3 Termes et définitions	62
4 Exigences de conception et de fabrication	64
4.1 Conception et construction des câbles	64
4.2 Conception et construction des connecteurs	65
4.3 Dimensions d'encombrement et dimensions de l'interface	65
5 Qualité d'exécution, marquage et emballage.....	65
5.1 Qualité d'exécution	65
5.2 Marquage	65
5.3 Protections d'extrémités.....	65
5.4 Emballage et étiquetage	65
6 Gestion de la qualité.....	65
7 Méthodes d'essai – Généralités.....	65
7.1 Conditions atmosphériques normalisées pour les essais.....	65
7.2 Examen visuel	66
7.3 Contrôle des dimensions.....	66
7.3.1 Dimensions d'interface	66
7.3.2 Dimensions d'encombrement.....	66
8 Essais électriques	67
8.1 Propriétés de réflexion.....	67
8.1.1 Objet	67
8.1.2 Matériel d'essai	67
8.1.3 Procédure.....	67
8.1.4 Exigences.....	68
8.1.5 Informations devant figurer dans la spécification particulière	68
8.2 Uniformité d'impédance	68
8.2.1 Objet	68
8.2.2 Procédure.....	68
8.2.3 Exigences.....	68
8.2.4 Informations devant figurer dans la spécification particulière	68
8.3 Pertes d'insertion.....	68
8.3.1 Procédure.....	68
8.3.2 Exigences.....	68
8.3.3 Informations devant figurer dans la spécification particulière	69
8.4 Stabilité des pertes d'insertion	69
8.4.1 Objet	69
8.4.2 Procédure.....	69
8.4.3 Exigences.....	69
8.4.4 Informations devant figurer dans la spécification particulière	69
8.5 Temps de propagation	69
8.5.1 Procédure.....	69
8.5.2 Exigences.....	69
8.5.3 Informations devant figurer dans la spécification particulière	69

8.6	Stabilité de la longueur électrique	69
8.6.1	Objet	69
8.6.2	Procédures	69
8.6.3	Exigences	72
8.6.4	Informations devant figurer dans la spécification particulière	72
8.7	Différence de phase	72
8.7.1	Objet	72
8.7.2	Procédure	72
8.7.3	Exigences	72
8.7.4	Informations devant figurer dans la spécification particulière	72
8.8	Variation de la phase avec la température	73
8.8.1	Objet	73
8.8.2	Procédure	73
8.8.3	Exigences	73
8.8.4	Informations devant figurer dans la spécification particulière	73
8.9	Efficacité d'écran	73
8.9.1	Impédance de transfert	73
8.9.2	Affaiblissement d'écran	73
8.10	Tenue en tension	74
8.10.1	Procédure	74
8.10.2	Exigences	74
8.10.3	Informations devant figurer dans la spécification particulière	74
8.11	Résistance d'isolement	74
8.11.1	Procédure	74
8.11.2	Exigences	74
8.11.3	Informations devant figurer dans la spécification particulière	74
8.12	Continuité des conducteurs intérieur et extérieur	75
8.12.1	Objet	75
8.12.2	Procédure	75
8.12.3	Exigences	75
8.12.4	Informations devant figurer dans la spécification particulière	75
8.13	Puissance assignée	75
8.13.1	Objet	75
8.13.2	Procédure	75
8.13.3	Exigences	75
8.13.4	Informations devant figurer dans la spécification particulière	75
8.14	Mesurage du niveau d'intermodulation	76
8.14.1	Procédure	76
8.14.2	Exigences	76
8.14.3	Informations devant figurer dans la spécification particulière	76
9	Essais de robustesse mécanique	76
9.1	Traction	76
9.1.1	Objet	76
9.1.2	Procédure	76
9.1.3	Exigences	76
9.1.4	Informations devant figurer dans la spécification particulière	77
9.2	Flexion	77
9.2.1	Objet	77
9.2.2	Procédure	77

9.2.3	Exigences.....	77
9.2.4	Informations devant figurer dans la spécification particulière	77
9.3	Endurance de la flexion	78
9.3.1	Objet	78
9.3.2	Procédure.....	78
9.3.3	Exigences.....	78
9.3.4	Informations devant figurer dans la spécification particulière	78
9.4	Ecrasement de cordon	78
9.4.1	Objet	78
9.4.2	Procédure.....	79
9.4.3	Exigences.....	79
9.4.4	Informations devant figurer dans la spécification particulière	79
9.5	Couple	79
9.5.1	Procédure.....	79
9.5.2	Exigences.....	80
9.5.3	Informations devant figurer dans la spécification particulière	80
9.6	Courbures multiples	80
9.6.1	Objet	80
9.6.2	Procédure.....	80
9.6.3	Exigences.....	81
9.6.4	Informations devant figurer dans la spécification particulière	81
9.7	Essai d'abrasion de cordon	81
9.7.1	Objet	81
9.7.2	Procédure.....	81
9.8	Vibrations et chocs	81
9.9	Essai d'impact	81
9.10	Endurance mécanique	81
10	Essais d'environnement.....	82
10.1	Sévérités recommandées.....	82
10.2	Vibrations, secousses et chocs	82
10.3	Séquence climatique.....	82
10.3.1	Procédure.....	82
10.3.2	Exigences.....	82
10.3.3	Informations devant figurer dans la spécification particulière	82
10.4	Chaleur humide, essai continu	82
10.4.1	Procédure.....	82
10.4.2	Exigences.....	82
10.4.3	Informations devant figurer dans la spécification particulière	83
10.5	Variations rapides de température	83
10.5.1	Procédure.....	83
10.5.2	Exigences.....	83
10.5.3	Informations devant figurer dans la spécification particulière	83
10.6	Résistance aux solvants et aux fluides contaminants	83
10.6.1	Procédure.....	83
10.6.2	Exigences.....	83
10.6.3	Informations devant figurer dans la spécification particulière	84
10.7	Immersion dans l'eau	84
10.7.1	Procédure.....	84
10.7.2	Exigences.....	84

10.7.3	Informations devant figurer dans la spécification particulière	84
10.8	Essais au brouillard salin et à l'anhydride sulfureux	84
10.8.1	Procédure.....	84
10.8.2	Exigences.....	84
10.8.3	Informations devant figurer dans la spécification particulière	84
10.9	Essais à la poussière	84
10.9.1	Objet	84
10.9.2	Procédure.....	85
10.9.3	Exigences.....	85
10.9.4	Informations devant figurer dans la spécification particulière	85
10.10	Inflammabilité	85
10.10.1	Procédure.....	85
10.10.2	Exigences.....	85
10.10.3	Informations devant figurer dans la spécification particulière	85
11	Méthodes d'essai spécialisées.....	85
12	Programmes d'essais	85
Annexe A (normative)	Méthodes d'essai pour la détermination des pertes d'insertion	87
A.1	But.....	87
A.2	Méthodes d'essai.....	87
A.2.1	Généralités.....	87
A.2.2	Méthode d'essai 1.....	87
A.2.3	Méthode d'essai 2.....	88
A.2.4	Méthode d'essai 3.....	90
A.3	Correction de différences d'impédance caractéristique.....	91
Annexe B (informative)	Méthodes de mesurage du temps de propagation.....	93
B.1	Généralités	93
B.2	Méthode de la résonance pour le mesurage du temps de propagation	93
B.3	Méthode du domaine temporel pour le mesurage du temps de propagation.....	94
Annexe C (informative)	Sévérités recommandées pour les essais d'environnement	95
C.1	Introduction à la relation entre les conditions d'environnement et les sévérités d'essai	95
C.1.1	Généralités.....	95
C.1.2	Conditions d'environnement.....	95
C.1.3	Essais d'environnement.....	95
C.2	Sévérités recommandées pour les essais d'environnement.....	96
C.2.1	Vibrations	96
C.2.2	Secousses.....	97
C.2.3	Chocs	97
C.2.4	Séquence climatique	98
C.2.5	Essai continu de chaleur humide	98
C.2.6	Variations rapides de température	98
C.2.7	Brouillard salin.....	98
C.2.8	Essai au dioxyde de soufre.....	98
C.2.9	Essai de poussière	98
Annexe D (normative)	Gestion de la qualité	99
D.1	Généralités	99
D.2	Objet.....	99
D.3	Aspects fondamentaux.....	99

D.3.1	Documents associés	99
D.3.2	Normes et valeurs préférentielles	99
D.3.3	Marquage et emballage des cordons (voir 5.2)	99
D.3.4	Terminologie.....	100
D.4	Procédures de gestion de la qualité	100
D.4.1	Procédures pour l'homologation.....	100
D.4.2	Procédures d'agrément de savoir-faire	101
D.4.3	Contrôle de conformité de la qualité	102
D.5	Manuel et agrément de savoir-faire	103
D.5.1	Responsabilités	103
D.5.2	Contenu du manuel de savoir-faire	104
D.5.3	Critères pour les limites du savoir-faire.....	105
Bibliographie.....		107
Figure 1	– Essai de courbure: cordon en forme de U	70
Figure 2	– Essai de courbure: cordon droit.....	71
Figure 3	– Essai de torsion: cordon en forme de U.....	72
Figure 4	– Montage d'essai de flexion du cordon	77
Figure 5	– Appareil pour l'essai d'endurance à la flexion du cordon	78
Figure 6	– Montage d'essai d'écrasement du câble	79
Figure 7	– Exemple de montage d'essai pour le couple.....	80
Figure 8	– Essai de courbures multiples.....	81
Figure A.1	– Circuit permettant de déterminer les pertes d'insertion	87
Figure A.2	– Circuit permettant de déterminer les pertes d'insertion – principe	89
Figure A.3	– Circuit de remplacement permettant de déterminer les pertes d'insertion.....	89
Figure A.4	– Circuit à double flux permettant de déterminer les pertes d'insertion.....	90
Figure B.1	– Disposition du matériel d'essai.....	93
Figure C.1	– Description de la démarche nécessaire à la préparation d'une spécification d'essais d'environnement	96
Tableau 1	– Plage normalisée de conditions atmosphériques	66
Tableau C.1	– Relation entre déplacement et accélération.....	97
Tableau C.2	– Relation entre accélération de crête et variation de vitesse	98
Tableau D.1	– Exemple de limites du savoir-faire pour cordons	105
Tableau D.2	– Exemple de limites du savoir-faire pour câbles souples.....	105
Tableau D.3	– Exemple de limites du savoir-faire pour connecteurs.....	105
Tableau D.4	– Exemple de diagramme (voir D.5.2.5)	106

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

**CORDONS COAXIAUX ET CORDONS
POUR FRÉQUENCES RADIOÉLECTRIQUES –****Partie 1: Spécification générique –
Exigences générales et méthodes d'essai****AVANT-PROPOS**

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La Norme internationale IEC 60966-1 a été établie par le comité d'études 46 de l'IEC: Câbles, fils, guides d'ondes, connecteurs, composants passifs pour micro-onde et accessoires.

Cette troisième édition annule et remplace la deuxième édition parue en 1999. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) L'Annexe C (informative) Méthode de mesure de l'efficacité d'écran a été retirée;
- b) Le paragraphe 8.9 donne les références aux procédures d'essai applicables.

Le texte de cette norme est issu des documents suivants:

FDIS	Rapport de vote
46/700A/FDIS	46/704/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette Norme internationale.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 60966, publiées sous le titre général *Cordons coaxiaux et cordons pour fréquences radioélectriques*, peut être consultée sur site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "<http://webstore.iec.ch>" dans les données relatives à la publication recherchée. A cette date, le document sera

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CORDONS COAXIAUX ET CORDONS POUR FRÉQUENCES RADIOÉLECTRIQUES –

Partie 1: Spécification générique – Exigences générales et méthodes d'essai

1 Domaine d'application

La présente partie de l'IEC 60966 définit les exigences relatives aux cordons coaxiaux et aux cordons pour fréquences radioélectriques travaillant en mode électromagnétique transversal (TEM: *Transverse Electromagnetic Mode*). Elle fixe des exigences générales pour contrôler les propriétés électriques, mécaniques et environnementales des cordons coaxiaux pour fréquences radioélectriques composés de câbles et de connecteurs. Des exigences supplémentaires relatives à des familles spécifiques de cordons figurent dans les spécifications intermédiaires applicables.

La conception des câbles et des connecteurs utilisés sera de préférence conforme aux différentes parties applicables de l'IEC 61196 et de l'IEC 61169, respectivement.

NOTE 1 Le présent document ne comprend pas les essais qui sont normalement effectués séparément sur les câbles et les connecteurs. Ces essais sont décrits dans l'IEC 61196-1 (toutes les parties) et l'IEC 61169-1, respectivement.

NOTE 2 Dans la mesure du possible, les câbles et connecteurs utilisés dans les cordons, même s'ils ne sont pas décrits dans la série IEC 61196 ou dans la série IEC 61169, sont soumis aux essais séparément conformément aux essais indiqués dans la spécification générique applicable.

NOTE 3 Lorsqu'un cordon possède une protection supplémentaire, les essais mécaniques et d'environnement décrits dans le présent document sont applicables.

2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60068 (toutes les parties), *Essais d'environnement*

IEC 60068-2-6, *Essais d'environnement – Partie 2-6: Essais – Essai Fc: Vibrations (sinusoïdales)*

IEC 60068-2-11, *Essais fondamentaux climatiques et de robustesse mécanique – Partie 2-11: Essais – Essai Ka: Brouillard salin*

IEC 60068-2-14, *Essais d'environnement – Partie 2-14: Essais – Essai N: Variation de température*

IEC 60068-2-27, *Essais d'environnement – Partie 2-27: Essais – Essai Ea et guide: Chocs*

IEC 60068-2-42, *Essais d'environnement – Partie 2-42: Essais – Essai Kc: Essai à l'anhydride sulfureux pour contacts et connexions*

IEC 60068-2-68, *Essais d'environnement – Partie 2-68: Essais – Essai L: Poussière et sable*

IEC 60068-2-78, *Essais d'environnement – Partie 2-78: Essais – Essai Cab: chaleur humide, essai continu*

IEC 60332-1-2:2004, *Essais des câbles électriques et à fibres optiques soumis au feu – Partie 1-2: Essai de propagation verticale de la flamme sur conducteur ou câble isolé – Procédure pour flamme à prémélange de 1 kW*

IEC 60512-6-2, *Connecteurs pour équipements électroniques – Essais et mesures – Partie 6-2: Essais de contraintes dynamiques – Essai 6b: Secousses*

IEC 60512-7-2, *Connecteurs pour équipements électroniques – Essais et mesures – Partie 7-2: Essais d'impact (fiches) – Essai 7b: Résistance mécanique aux chocs*

IEC 60529, *Degrés de protection procurés par les enveloppes (Code IP)*

IEC 60966-2 (toutes les parties), *Cordons coaxiaux et cordons pour fréquences radioélectriques*

IEC 60966-3 (toutes les parties), *Cordons coaxiaux et cordons pour fréquences radioélectriques*

IEC 60966-4 (toutes les parties), *Cordons coaxiaux et cordons pour fréquences radioélectriques*

IEC 61169 (toutes les parties), *Connecteurs pour fréquences radioélectriques*

IEC 61169-1:2013, *Connecteurs pour fréquences radioélectriques – Partie 1: Spécification générique – Prescriptions générales et méthodes de mesure*

IEC 61196 (toutes les parties), *Câbles coaxiaux de communication*

IEC 61196-1-119, *Coaxial communication cables – Part 1-119: Electrical test methods – RF power rating* (disponible en anglais seulement)

IEC 62037-2, *Dispositifs RF et à micro-ondes passifs, mesure du niveau d'intermodulation – Partie 2: Mesure de l'intermodulation passive dans les cordons coaxiaux*

IEC 62153-4-6, *Metallic cables and other passive components test methods – Part 4-6: Electromagnetic compatibility (EMC) – Surface transfer impedance – Line injection method* (disponible en anglais seulement)

IEC 62153-4-7:2015, *Méthodes d'essai des câbles métalliques de communication – Partie 4-7: Compatibilité électromagnétique (CEM) – Méthode d'essai pour mesurer l'impédance de transfert Z_T et l'affaiblissement d'écrantage a_s ou l'affaiblissement de couplage a_C des connecteurs et des cordons jusqu'à 3 GHz et au-dessus – Méthode triaxiale en tubes concentriques*