IEC 60966-3

Edition 3.0 2008-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Radio frequency and coaxial cable assemblies – Part 3: Sectional specification for semi-flexible coaxial cable assemblies

Cordons coaxiaux et cordons pour fréquences radioélectriques – Partie 3: Spécification intermédiaire relative aux cordons coaxiaux semi-flexibles

IEC 60966-3:2008-10(EN-FR)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX R

ICS 33.120.10

ISBN 978-2-8322-1357-5

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RADIO FREQUENCY AND COAXIAL CABLE ASSEMBLIES –

Part 3: Sectional specification for semi-flexible coaxial cable assemblies

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

This bilingual version (2014-01) corresponds to the monolingual English version, published in 2008-10.

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

The major change with respect to the second edition is a better definition of the tests to be performed.

This sectional specification is to be read in conjunction with the second edition of IEC 60966-1 (1999). It contains the same clauses as that of IEC 60966-1 and completes or amends them when required. When a clause of IEC 60966-1 does not appear in this standard,

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it applies as it is in IEC 60966-1. When this standard states "addition", "modification" or "replacement", the relevant text in Part 1 is to be adapted accordingly.

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

CDV	Report on voting
46/264/CDV	46/297/RVC

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

The French version of this standard has not been voted upon.

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

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RADIO FREQUENCY AND COAXIAL CABLE ASSEMBLIES –

Part 3: Sectional specification for semi-flexible coaxial cable assemblies

1 Scope

This part of IEC 60966 is a sectional specification that relates to semi-flexible coaxial cable assemblies operating in the transverse electromagnetic mode (TEM). It establishes uniform requirements for testing the electrical, mechanical and climatic properties of flexible cable assemblies composed of flexible coaxial cables and coaxial connectors.

NOTE 1 For the purposes of this sectional specification, a cable assembly is always regarded as an integral unit. All specifications apply to the finished assembly and not to individual and non-assembled parts thereof.

NOTE 2 This sectional specification should be supplemented with detail specifications giving additional details as required by the particular application. This application will not necessarily require all tests.

2 Normative references

The following referenced documents are indispensable for the application 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 60068-2-6, *Environmental testing – Part 2-6: Tests − Test Fc: Vibration (sinusoidal)*

IEC 60096-2, *Radio-frequency cables – Part 2: Relevant cable specifications*

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

IEC 60966-1:1999, *Radio frequency and coaxial cable assemblies – Part 1: Generic specification – General requirements and test methods*

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

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

IEC QC 001002 (all parts), *IEC Quality Assessment System for Electronic Components (IECQ) – Rules of procedure*

ISO 9000, *Quality management systems – Fundamentals and vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60966-1 apply.

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4 Design and manufacturing requirements

Clause 4 of IEC 60966-1 is applicable except as follows.

Replacement:

4.1 Cable design and construction

Cables should conform to IEC 60096-2 or IEC 61196. Where cable designs deviating from these publications are required, they shall comply with the requirements of the detail specification.

If required, the manufacturer may use additional protective tubing or cable deviating from IEC 61196 in order to comply with the requirements of the detail specification.

The materials used in the cable shall be given as engineering information in the detail specification.

4.2 Connector design and construction

Connectors should conform to IEC 61169. Where connector designs deviating from IEC 61169 are required, the interface should conform to the relevant part of IEC 61169 where available and shall comply with the requirements of the detail specification.

The materials used in the connector shall be given as engineering information in the detail specification.

4.3 Outline and interface dimensions

The outline and interface dimensions shall be in accordance with the detail specification of the cable assembly.

The length, unless otherwise specified in the detail specification, is defined as between the reference planes of the connectors. In case of right angle connectors, the length applies to the axis of the connectors (see Figure 1).

If not indicated in the detail specification, the length tolerance shall be ±1 % for cables equal to, or longer than, 300 mm and ±3 mm for cables shorter than 300 mm.

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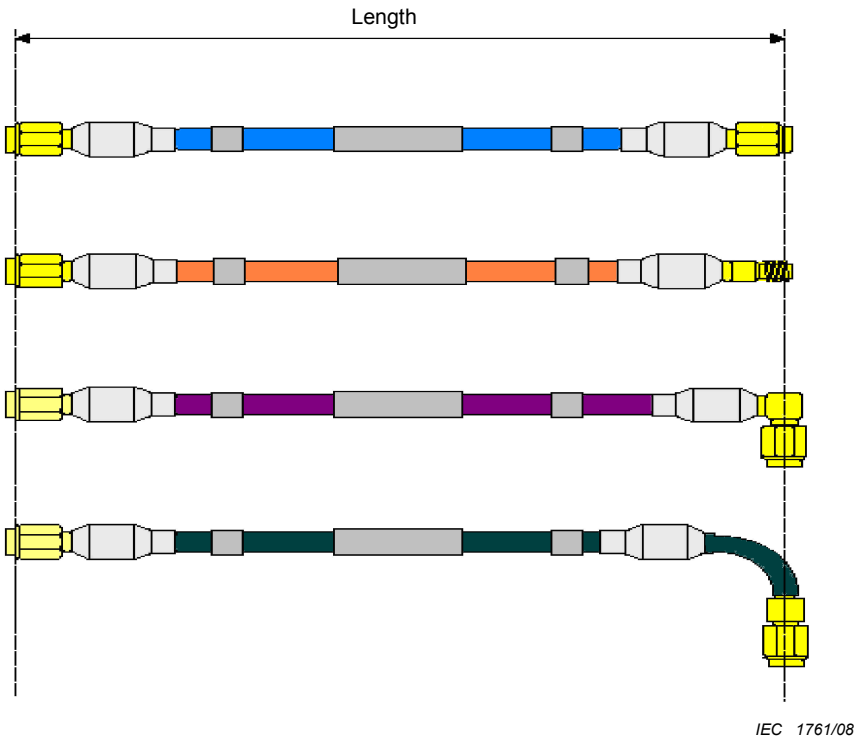


Figure 1 – Length definition of cable assemblies

5 Workmanship, marking and packaging

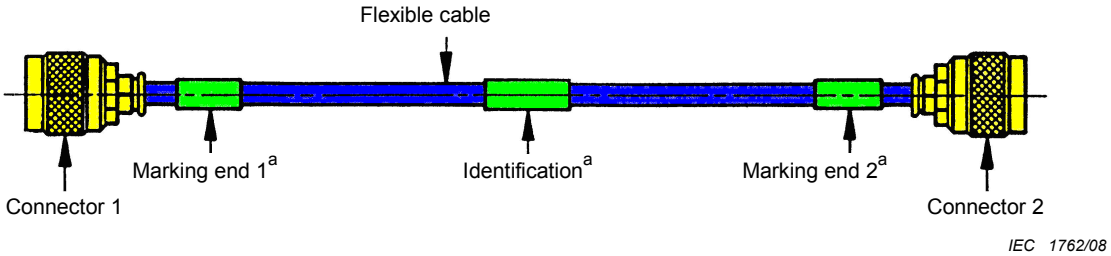
Clause 5 of IEC 60966-1 is applicable, except as follows.

5.2 Marking

Addition:

Cable assemblies made in accordance with this sectional specification comprise a section of cable and two connectors. When specified in the detail specification, the assembly may additionally include markers for identification of the assembly and interconnecting ends. End caps and other accessories may also be specified (see Figure 2).

NOTE Occasionally, the cable assembly will comprise only a cable and one connector.



[a] When specified.

Figure 2 – Example of a cable assembly

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6 Quality assessment

Clause 6 of IEC 60966-1 applies.

7 Test methods – General

Clause 7 of IEC 60966-1 applies.

8 Electrical tests

Clause 8 of IEC 60966-1 is applicable, except as follows.

8.1.4 Information to be given in the detail specification

Addition:

While the parameter return loss (A_r) is preferred, the reflection factor (r) or the VSWR (voltage standing wave ratio) may be specified

where

$$A_r = -20 \log_{10} |r|$$

and

$$\text{VSWR} = \frac{1+|r|}{1-|r|}$$

8.4 Insertion loss stability

Replacement:

This test is not applicable to semi-flexible coaxial assemblies.

8.7.1 Object

Modification:

To measure the difference between two or more cable assemblies. The phase difference shall not exceed the limits specified in the relevant detail specification.

If more than two cable assemblies belong to a matched set, the reference cable shall be clearly marked.

8.9 Screening effectiveness

Replacement:

8.9.1 Requirements

The transfer impedance shall be below the specified limit.

When the test is performed at 30 MHz, the detail specification should indicate one of the preferred maximum values as follows:

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– 30 μΩ/m;
– 300 μΩ/m;
– 3 mΩ/m.

8.9.2 Information to be given in the detail specification

The following information is to be given:

a) mounting details of the cable assembly under test;
b) limit of the transfer impedance.

8.10.3 Information to be given in the detail specification

Replacement:

The following information is to be given:

a) test voltage;
b) any special requirements.

If not indicated in the detail specification, the test shall be carried out at sea-level. Additionally, high altitude may be required by the detail specification. Preferred values are:

– sea-level: 86 kPa to 106 kPa;
– 10 km: 25 kPa;
– 20 km: 4,4 kPa.

9 Mechanical robustness tests

Clause 9 of IEC 60966-1 is applicable except as follows:

9.2 Flexure

Replacement:

This test is not applicable to semi-flexible coaxial assemblies.

9.3 Flexing endurance

Replacement:

This test is not applicable to semi-flexible coaxial assemblies.

10 Environmental tests

Clause 10 of IEC 60966-1 is applicable except as follows.

10.2 Vibration, bumps and shock

Replacement:

10.2.1 Vibration

10.2.1.1 Procedure

The tests shall be carried out in accordance with test Fc of IEC 60068-2-6.

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The vibration severity shall be chosen from D.2.1 of IEC 60966-1, unless otherwise indicated in the detail specification.

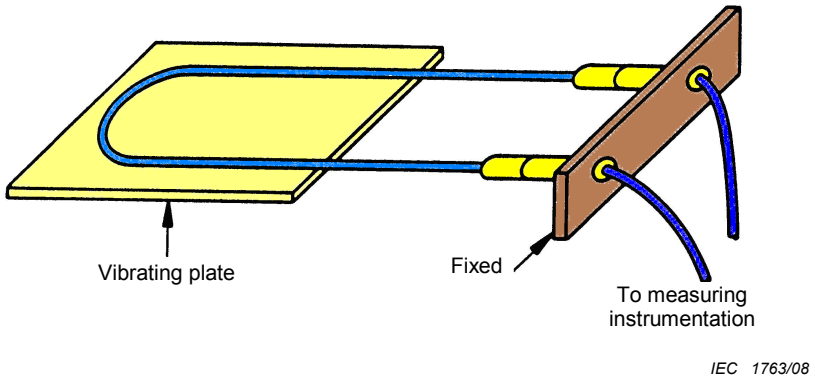

Figure 3 – Preferred arrangement for the vibration test

The preferred arrangement for the vibration test is described in Figure 3. The cable portion of the cable assembly shall be vibrated in each of three perpendicular directions, one of which shall be parallel to the common axis of the connectors. The continuity of the inner and outer conductors shall be monitored during the test.

10.2.1.2 Requirements

There shall be no evidence of cracking, breaking or loosening of parts of a component and there shall be no current discontinuity in excess of 1 µs.

After the test, the insertion loss and return loss shall not exceed the specified limits.

10.2.1.3 Information to be given in the detail specification

The following information is to be given:

a) mounting and fixing details of the cable assembly;

NOTE The length of the cable in relation to its diameter, between the mounting plate and the fixed plate, is an important variable. The fixed plate should be rigid.

b) profile and severity parameters for vibration. These should include duration, frequency and acceleration or displacement.

10.2.2 Bumps

This test shall be specified, if necessary, in the detail specification. For the recommended severities, see D.2.2 of IEC 60966-1.

10.2.3 Shock

This test shall be specified, if necessary, in the detail specification. For the recommended severities, see D.2.3 of IEC 60966-1.

10.3.1 Procedure

Addition:

The test severities indicated in D.2.4 of IEC 60966-1 are preferred.

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