

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Coaxial communication cables –
Part 1-318: Mechanical test methods – Heat performance tests
STANDARD PREVIEW
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Câbles coaxiaux de communication –
Partie 1-318: Méthodes d'essais mécaniques – Essais de comportement à la
chaleur
IEC 61196-1-318:2008
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COAXIAL COMMUNICATION CABLES –**Part 1-318: Mechanical test methods –
Heat performance tests**

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International Standard IEC 61196-1-318 has been prepared by subcommittee 46A: Coaxial cables, of IEC technical committee 46: Cables, wires, waveguides, R.F. connectors, R.F. and microwave passive components and accessories.

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

FDIS	Report on voting
46A/874/FDIS	46A/891/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 the parts in the IEC 61196 series, under the general title *Coaxial communication cables*, 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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COAXIAL COMMUNICATION CABLES –

Part 1-318: Mechanical test methods – Heat performance tests

1 Scope

This part of IEC 61196 applies to coaxial communication cables. It specifies several test methods for determining:

- **heat flow resistance of dielectric:** the resistance of the dielectric to the mechanical distortion induced by radial stress imposed by the inner conductor at high temperatures;
- **resistance to heat exposure (formerly “heat shock resistance“):** the resistance of the dielectric or the sheath to high temperatures;
- **heat behaviour of semi-rigid cables:** the ability of the cable construction of semi-rigid cables to withstand the expansion of the dielectric at high temperature;
- **dimensional stability:** the displacement of the cable elements with respect to each other in order to demonstrate the suitability of a cable for use with connectors.

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

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Tests B: Dry heat*

3 Terms and definitions

For the purposes of this document the definitions given in IEC 61196-1 apply.

4 Heat flow resistance of dielectric

4.1 Preparation of the test sample

A sample shall be cut from the finished cable which shall have a length of at least 30 times the overall diameter of the cable.

A weight, as indicated in the relevant cable specification, shall be attached to the inner conductor at each end of the test sample.

4.2 Procedure

The test sample shall be bent symmetrically over a horizontal mandrel the dimensions of which are equal to the minimum bend radius as specified in the relevant cable specification and with the weights hanging freely from the inner conductor at each end of the test sample. The test sample shall be heated in accordance with IEC 60068-2-2, test Bb, to the temperature indicated in the relevant cable specification for at least 8 h.

At the end of the period the weights shall be removed and the test sample shall be allowed to cool without further bending for 1 h under standard atmospheric conditions for testing. The test sample shall be stripped down and the movement of the inner conductor from the centre of the cable shall be measured.

4.3 Requirement

The inner conductor shall not be displaced from the centre by a distance greater than 15 % of the nominal diameter of the dielectric.

4.4 Test report

The test report shall give the test conditions:

- length of the cable under test (m),
- weight at each end of the sample (kg),
- diameter of the mandrel (mm),
- temperature of the heating (°C),
- duration of the exposure to temperature (h),

and record the result of the examination according to 4.2 of this document.
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5 Heat shock resistance

5.1 Preparation of the test sample

A sample shall be cut from the finished cable which shall have a length at least 150 times the overall diameter of the cable if it is less than 12,5 mm and 120 times the overall diameter of the cable if it is 12,5 mm or greater.

The test sample shall be coiled to a diameter not less than 30 times the nominal overall diameter of the cable.

5.2 Procedure

The test sample shall be heated for 7 days in accordance with IEC 60068-2-2, test Bb, at a temperature indicated in the relevant cable specification.

At the end of the heating period the test sample shall be removed from the oven and allowed to cool down for 1 h at room temperature, (20 ± 5) °C. Then the whole length of the test sample shall be wrapped around a mandrel the dimensions of which are equal to the minimum bend radius as specified in the relevant cable specification and then unwrapped. The cycle shall be repeated 10 times in a period of 5 min.

The test sample shall be stripped down and examined with normal vision or corrected vision without magnification.

5.3 Requirement

There shall be no sign of mechanical damage to either the dielectric or the sheath.

5.4 Test report

The test report shall give the test conditions:

- length of the cable under test (m),
- diameter of coiling during heating (mm),
- temperature of the heating (°C),

and record the result of the examination according to 5.2 of this document.

6 Heat behaviour of semi-rigid cables

6.1 Preparation of the test sample

The test sample shall be between 300 mm and 350 mm long. The ends of the test sample shall be closed by crushing to prevent the dielectric from coming out of the tube outer conductor.

6.2 Procedure

The test sample shall be placed for 1 h in an oven maintained at the temperature indicated in the relevant cable specification. The test sample shall be allowed to cool to room temperature. The test sample shall be examined with normal vision or corrected vision without magnification.

6.3 Requirement

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Neither cracks nor longitudinal splits shall be visible in the outer conductor. Nor shall the dielectric core protrude from the ends of the test sample.

6.4 Test report

The test report shall give the test conditions:

- temperature of the heating (°C),
- length of the cable under test (mm),

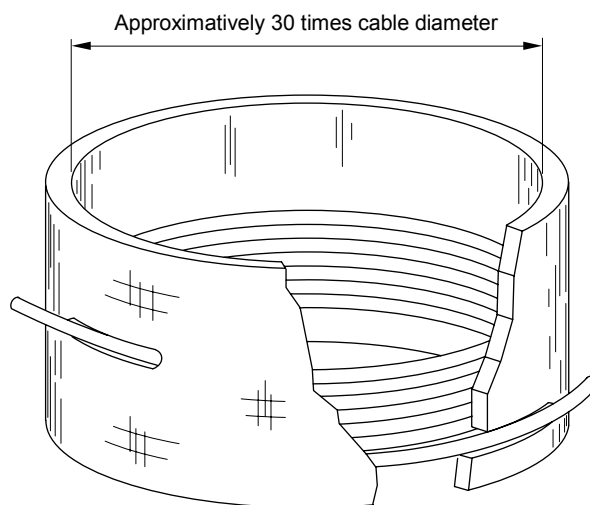
and record the result of the examination according to 6.2 of this document.

7 Dimensional stability

7.1 Preparation of the test sample

Three samples each 1,5 m long shall be cut from the finished cable. The ends of each test sample shall be cleanly cut at right angles to the longitudinal axis.

Each test sample shall be coiled around the interior surface of an open cylindrical container having a diameter approximately 30 times the nominal overall diameter of the cable, see Figure 1. It shall be wound so that no means of fixation is used to keep it in position. After coiling the centre conductor and the dielectric shall terminate in the same perpendicular cutting plane on both ends of the test sample.



IEC 017/08

Figure 1 – Open cylindrical container

7.2 Procedure

The container loaded with the test sample shall be heated in accordance with IEC 60068-2-2, test Bb, at a temperature stated in the relevant cable specification for a period of at least 20 h.

The container shall then be allowed to cool to room temperature. Without uncoiling the sample the displacement of the cable elements with respect to each other shall be measured at both ends.

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7.3 Expression of results

The average of the measurements for the six ends shall be defined as the displacement of the cable elements.

7.4 Requirement

The displacement of the cable elements shall comply with that indicated in the relevant cable specification.

7.5 Test report

The test report shall give the test conditions:

- temperature of the heating (°C),
- diameter of the container (m),

and record the result of the measurement according to 7.2 of this document.

Bibliography

IEC 60050, *International Electrotechnical Vocabulary*

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