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Hollow metallic waveguides -
Part 2: Relevant specifications for ordinary rectangular waveguides

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Hollow metallic waveguides - Part 2: Relevant specifications for ordinary rectangular waveguides

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IEC 60153-2 has been prepared by subcommittee 46F: RF and microwave passive components, of IEC technical committee 46: Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2016. This edition constitutes a technical revision.

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

a) addition of a cross-sectional view of the waveguide;
b) addition of informative content on the theoretical background of the standard;
c) use of a lower case "k" in the waveguide designation, where appropriate;

d) revision of main specification table (now Table 1):
   1) two waveguides moved to the end of the table (R 35, R 41);
   2) correction of one waveguide designation (now R 26k);
   3) correction of one waveguide outside width (R 18);
   4) relaxation of tolerances of waveguide outside dimensions (R 14 to R 70);
   5) removed attenuation values of waveguides made of gold, aluminium, and stainless steel;
   6) implementation of attenuation values for an idealised copper waveguide;
e) relaxation of tolerances of waveguide outside dimensions for R 14 to R 70 in the table now referred to as Table 4;
f) clarification of the electrical tests:
   1) use of standard annealed copper as the reference material for waveguide tubes;
   2) correction of the formula for calculating the theoretical attenuation of an idealised copper waveguide;
   3) addition of a formula for calculating the theoretical attenuation of waveguides made of any material;
   4) addition of an informative table with typical waveguide materials (Table 5);
g) addition of an informative cross-reference for waveguide type designations (Annex A).

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

Draft	Report on voting
46F/724/FDIS	46F/732/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/publications.

A list of all parts of the IEC 60153 series, published under the general title *Hollow metallic waveguides*, can be found on the IEC website at webstore.iec.ch.

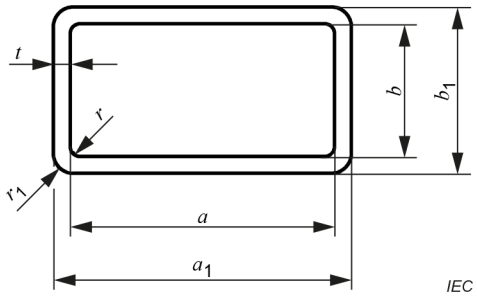
The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

1 Scope

This part of the IEC 60153 specifies straight hollow metallic tubing of ordinary rectangular cross-section for use as waveguides in radio frequency electrical applications. The principal cross-section for such tubing is shown in Figure 1 together with its defining geometrical dimensions.

NOTE This document serves to define tubular semi-finished products that are characterised by specifying both their inside and outside dimensions. However, in the case of particularly large and particularly small waveguides, this document only specifies inside dimensions. This is for production-related reasons.



Key

a	inside width	r	inside corner radius
a_1	outside width	r_1	outside corner radius
b	inside height	t	wall thickness
b_1	outside height		

Figure 1 – Cross-sectional view of ordinary rectangular waveguide tubing

The term "ordinary rectangular waveguide" in the title of this document refers to rectangular waveguides with a b-to-a ratio of 0,5 (or slightly less).

The objective of this document is to specify for hollow metallic waveguides:

a) the details necessary to ensure compatibility and, as far as is essential, interchangeability;

b) test methods;

c) uniform requirements for the electrical and mechanical properties.

This document does not contain any binding specifications for the materials to be used, but merely examples. The exact selection of materials is subject to agreement between the customer and the supplier.

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 60050 (all parts), *International Electrotechnical Vocabulary* (available at http://www.electropedia.org)

IEC 60153-1, *Hollow metallic waveguides - Part 1: General requirements and measuring methods*

IEC 60261, *Sealing test for pressurized waveguide tubing and assemblies*