

<b>STN</b>	<b>Príruby na vlnovody. Časť 2: Špecifikácie na príruby bežných pravouhlých vlnovodov.</b>	<b>STN EN 60154-2</b>  34 7911
------------	--	--

Flanges for waveguides - Part 2: Relevant specifications for flanges for ordinary rectangular waveguides

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 05/17

Obsahuje: EN 60154-2:2016, IEC 60154-2:2016

Oznámením tejto normy sa od 25.11.2019 ruší  
STN EN 60154-2 (34 7911) z júna 2001

**124674**

---

Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2017  
Podľa zákona č. 264/1999 Z. z. o technických požiadavkách na výrobky a o posudzovaní zhody a o zmene a doplnení niektorých zákonov v znení neskorších predpisov sa slovenská technická norma a časti slovenskej technickej normy môžu rozmnožovať alebo rozširovať len so súhlasom slovenského národného normalizačného orgánu.

English Version

## Flanges for waveguides - Part 2: Relevant specifications for flanges for ordinary rectangular waveguides (IEC 60154-2:2016)

Brides pour guides d'ondes - Partie 2: Spécifications  
applicables relatives aux brides pour guides d'ondes  
rectangulaires normaux  
(IEC 60154-2:2016)

Flansche für Hohlleiter - Teil 2: Allgemeine Anforderungen  
an Flansche für Rechteck-Hohlleiter  
(IEC 60154-2:2016)

This European Standard was approved by CENELEC on 2016-08-09. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## European foreword

The text of document 46F/305/CDV, future edition 3 of IEC 60154-2, prepared by SC 46F "RF and microwave passive components", of IEC/TC 46 "Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60154-2:2016.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2017-05-25
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-11-25

This document supersedes EN 60154-2:1997.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

## Endorsement notice

The text of the International Standard IEC 60154-2:2016 was approved by CENELEC as a European Standard without any modification.

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u> series	<u>Title</u>	<u>EN/HD</u>	<u>Year</u> series
IEC 60050		International Electrotechnical Vocabulary -- Part_102: Mathematics_- General concepts and linear algebra		
IEC 60153-2	2016	Hollow metallic waveguides - Part 2: Relevant specifications for ordinary rectangular waveguides	EN 60153-2	2016
ISO/IEC Guide 98-3 2008		Uncertainty of measurement -- Part 3:- Guide to the expression of uncertainty in measurement (GUM:1995)		-



# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



---

**Flanges for waveguides –  
Part 2: Relevant specifications for flanges for ordinary rectangular waveguides**

**Brides pour guides d'ondes –  
Partie 2: Spécifications applicables relatives aux brides pour guides d'ondes  
rectangulaires normaux**





**THIS PUBLICATION IS COPYRIGHT PROTECTED**  
**Copyright © 2016 IEC, Geneva, Switzerland**

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office  
 3, rue de Varembe  
 CH-1211 Geneva 20  
 Switzerland

Tel.: +41 22 919 02 11  
 Fax: +41 22 919 03 00  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

#### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

#### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

#### IEC Catalogue - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

#### IEC publications search - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

#### IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)

65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

#### IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [csc@iec.ch](mailto:csc@iec.ch).

#### A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

#### A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

#### Catalogue IEC - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

#### Recherche de publications IEC - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 15 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

#### Glossaire IEC - [std.iec.ch/glossary](http://std.iec.ch/glossary)

65 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

#### Service Clients - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: [csc@iec.ch](mailto:csc@iec.ch).



# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



---

**Flanges for waveguides –  
Part 2: Relevant specifications for flanges for ordinary rectangular waveguides**

**Brides pour guides d'ondes –  
Partie 2: Spécifications applicables relatives aux brides pour guides d'ondes  
rectangulaires normaux**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

---

ICS 33.120.10

ISBN 978-2-8322-3496-9

**Warning! Make sure that you obtained this publication from an authorized distributor.  
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions .....	7
4 General.....	7
4.1 Standardized types .....	7
4.2 Flange designation.....	7
5 Mechanical requirements .....	8
5.1 Dimensions .....	8
5.1.1 Alignment holes .....	8
5.1.2 Shank diameter of fixing bolts used for alignment .....	8
5.1.3 Relation between shank and alignment hole diameters .....	8
5.1.4 Overall dimensions and thickness of flanges.....	9
5.1.5 Surface roughness of contact area of flanges .....	9
5.1.6 Flatness of contact area .....	9
5.1.7 Perpendicularity of the axis of the holes .....	9
5.1.8 General requirements for assemblies.....	9
5.1.9 Perpendicularity of the contact area.....	9
5.2 Additional requirements for unmounted flanges.....	10
5.2.1 General .....	10
5.2.2 Shape of aperture .....	10
5.2.3 Ordering information .....	10
5.3 Information on reflection.....	10
Figure 1 – Flange type A: 60154 IEC-AR 32 .....	16
Figure 2 – Flange type A: 60154 IEC-AR 32 gasket .....	16
Figure 3 – Flange type A: 60154 IEC-AR 48 .....	17
Figure 4 – Flange type A: 60154 IEC-AR 48 gasket .....	17
Figure 5 – Flange type A: 60154 IEC-AR 58-70 .....	18
Figure 6 – Flange type A: 60154 IEC-AR 58-70 gasket .....	18
Figure 7 – Flange type B: 60154 IEC-BR 84-320 .....	21
Figure 8 – Flange type B: 60154 IEC-BR 84-320 gasket .....	21
Figure 9 – Flange type C: 60154 IEC-PCR 220-500 .....	24
Figure 10 – Flange type C: 60154 IEC-PCR 220-500 gasket .....	24
Figure 11 – Flange type C: 60154 IEC-PCR 220-500 .....	27
Figure 12 – Flange type C: 60154 IEC-PCR 220-500 gasket .....	27
Figure 13 – Recommended gaskets for flanges without gasket groves .....	28
Figure 14 – Recommended gaskets for type PDR 3 to 12 flanges .....	29
Figure 15 – Flange type D: 60154 IEC-PDR 3 AND UDR 3.....	30
Figure 16 – Flange type D: 60154 IEC-PDR 4 AND UDR 4.....	31
Figure 17 – Flange type D: 60154 IEC-PDR 5 AND UDR 5.....	32
Figure 18 – Flange type D: 60154 IEC-PDR 6 AND UDR 6.....	33



Figure 19 – Flange type D: 60154 IEC-PDR 8 AND UDR 8.....	34
Figure 20 – Flange type D: 60154 IEC-PDR 9 AND UDR 9.....	35
Figure 21 – Flange type D: 60154 IEC-PDR 12 AND UDR 12.....	36
Figure 22 – Flange type D: 60154 IEC-PDR 14 – 40.....	37
Figure 23 – Flange type D: 60154 IEC-PDR 48 – 100.....	38
Figure 24 – Flange type D: 60154 IEC-UDR 120 – 180.....	39
Figure 25 – Flange type D: 60154 IEC-PDR 120 – 180.....	40
Figure 26 – Flange type E: 60154 IEC-UER 32.....	43
Figure 27 – Flange type E: 60154 IEC-UER 40-100.....	44
Figure 28 – Flange type F: 60154 IEC-UFC without choke or gasket groove.....	47
Figure 29 – Flange type G: 60154 IEC-UGC without choke or gasket groove.....	49
Table 1 – ISO specifications.....	9
Table 2 – Requirements of root mean square of roughness on the contact area.....	9
Table 3 – The worst "return loss" in (positive) decibels for waveguides.....	12
Table 4 – Flange types.....	14
Table 5 – Dimensions of type A flange for ordinary rectangular waveguides.....	19
Table 6 – Dimensions of type B flange for ordinary rectangular waveguides.....	22
Table 7 – Dimensions of type C flange for ordinary rectangular waveguides.....	25
Table 8 – Dimensions of type D flange for ordinary rectangular waveguides.....	41
Table 9 – Dimensions of type E flange for ordinary rectangular waveguides.....	45

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FLANGES FOR WAVEGUIDES –****Part 2: Relevant specifications for flanges  
for ordinary rectangular waveguides**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60154-2 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

This third edition cancels and replaces the second edition published in 1980. This edition constitutes a technical revision.

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

- a) revise the estimation for return loss at connection interface of waveguides;
- b) add two type of waveguide flange for high frequency application, i.e. over 50 GHz;
- c) expand the operation frequency range up to 3,3 THz;
- d) rename the frequency band over R 1200, i.e. R1,2k.

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

CDV	Report on voting
46F/305/CDV	46F/319/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.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60154 series, published under the general title *Flanges for waveguides*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

## INTRODUCTION

This International Standard relates to straight hollow metallic tubing for use as waveguides in electronic equipment. In recent years, the operation frequency of waveguide components and systems has been extended to 1 THz and above. However, the IEC 60154 series, series of standards for flanges for waveguides, currently specifies the interface designs up to 40 GHz for rectangular waveguide. In addition to this, the current issues of the IEC 60154 series of standards were issued in the 1970's and do not meet the needs of current applications. This new edition of IEC 60154-2 addresses these two issues by extending the frequency coverage to 3 300 GHz and by addressing current applications for this type of waveguide.

## FLANGES FOR WAVEGUIDES –

### Part 2: Relevant specifications for flanges for ordinary rectangular waveguides

#### 1 Scope

This part of IEC 60154 specifies the dimensions of flanges for ordinary rectangular waveguide for use in electronic equipment.

It covers requirements for flanges drilled before or after mounting on waveguides. It should be noted that for optimum electrical performance, post-drilling of the alignment holes after mounting is recommended.

The aim of this standard is to specify for waveguide flanges the mechanical requirements necessary to ensure compatibility and, as far as practicable, interchangeability as well as to ensure adequate electrical performance.

#### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 60153-2:2016, *Hollow metallic waveguides – Part 2: Relevant specifications for ordinary rectangular waveguides*

ISO/IEC Guide 98-3:2008, *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**