

Flanges for waveguides - Part 4: Specifications for flanges for circular waveguides

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Flanges for waveguides  
Part 4: Relevant specifications for flanges for  
circular waveguides

Brides pour guides d'ondes  
Quatrième partie: Spécifications  
particulières de brides pour guides  
d'ondes circulaires

Flansche für Hohlleiter  
Teil 4: Allgemeine Empfehlungen  
für Flansche für  
Rundrohr-Hohlleiter

RD: IEC 154-4 (1969) ed 1; IEC/SC 46B (not appended)

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The Harmonization Document consists of the following:

- Title Page

Related to Directive: -

[SIST HD 129.4 S1:2002](https://standards.iteh.ai/catalog/standards/sist/2691976a-5062-4e7c-9e44-a50127760507/iec-hd-129-4-s1-2002)

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**Brides pour guides d'ondes**

**Quatrième partie:  
Spécifications particulières de brides  
pour guides d'ondes circulaires**

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**Flanges for waveguides**

**Part 4:** [SIST HD 129.4 S1:2002](https://standards.iteh.ai/catalog/standards/sist/2691976a-5062-4e7c-9e44-45661279251c/iec-60154-4-2002)  
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**Relevant specifications for flanges  
for circular waveguides**

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For price, see current catalogue*

CONTENTS

	Page
FOREWORD . . . . .	5
PREFACE . . . . .	5
General. . . . .	9
Mechanical requirements . . . . .	9
<i>Type J flanges</i>	
Pressurizable 154 IEC — PJC 18 — PJC 28.7	
Drawing - Figure 1. . . . .	16
Tables Ia and Ib . . . . .	21-24
<i>Type J flanges</i>	
Pressurizable 154 IEC — PJC 30 — PJC 46.2	
Drawing - Figure 2. . . . .	17
Tables Ia and Ib . . . . .	21-24
<i>Type J flanges</i>	
Pressurizable 154 IEC — PJC 48 — PJC 73.9	
Drawing - Figure 3. . . . .	18
Tables Ia and Ib . . . . .	21-24
<i>Type J flanges</i>	
Pressurizable 154 IEC — PJC 76 — PJC 140	
Drawing - Figure 4. . . . .	19
Tables Ia and Ib . . . . .	21-24
APPENDIX A — Notes for Table Ia (metric and inch) . . . . .	13
APPENDIX B — Notes for Table Ib (metric and inch) . . . . .	15

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SIST HD 129.4 S1:2002



INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FLANGES FOR WAVEGUIDES**

**Part 4: Relevant specifications for flanges  
for circular waveguides**

FOREWORD

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote this international unification, the IEC expresses the wish that all National Committees having as yet no national rules, when preparing such rules, should use the IEC recommendations as the fundamental basis for these rules in so far as national conditions will permit.
- 4) The desirability is recognized of extending international agreement on these matters through an endeavour to harmonize national standardization rules with these recommendations in so far as national conditions will permit. The National Committees pledge their influence towards that end.
- 5) The IEC has not laid down any procedure concerning marking as an indication of approval and has no responsibility when an item of equipment is declared to comply with one of its recommendations.

**iTeh STANDARD PREVIEW**

PREFACE

This Recommendation has been prepared by Sub-Committee 46B, Waveguides and their Accessories, of IEC Technical Committee No. 46, Cables, Wires and Waveguides for Telecommunication Equipment.

[SIST HD 129.4 S1:2002](https://standards.iteh.ai/catalog/standards/sist/2691976a-5062-4e7c-9e44-a36ca1276312/sist-46-129-4-s1-2002)

It forms the fourth part of the complete Recommendation dealing with Flanges for Waveguides, and should be used in conjunction with Part 1, General Requirements and Measuring Methods, issued as IEC Publication 154-1.

Subsequent relevant specifications for other types of flanges will be issued in separate publications.

A draft was discussed at the meeting held in Bucharest in 1962, as a result of which a new draft was submitted to the National Committees for approval under the Six Months' Rule in January 1964. Comments received were discussed at the meetings held in Baden-Baden in 1965 and in Tel-Aviv in 1966. Amendments were submitted to the National Committees for approval under the Two Months' Procedure in April 1967.

The following countries voted explicitly in favour of publication of Part 4:

Australia	Korea (Republic of)
Belgium	South Africa
Czechoslovakia	Sweden
Denmark	Switzerland
Finland	Turkey
France	United Kingdom
Germany	United States of America
Israel	Yugoslavia
Italy	Netherlands
Japan	

## DIMENSIONAL DEVIATIONS

The values for the permissible deviations in this Recommendation follow the principles given in ISO Recommendation R 286, ISO System of Limits and Fits, where:

Deviation is defined as:

Algebraical difference between a size (actual maximum, etc.) and the corresponding basic size.

Upper deviation is defined as:

Algebraical difference between the maximum limits of size and the corresponding basic size.

And lower deviation is defined as:

Algebraical difference between the minimum limit of size and the corresponding basic size.

It should be noted that the upper and lower deviations may have like signs, unlike signs or either deviation may be zero. This permits the basic sizes of mating shafts and holes to be identical.

The older concept of plus tolerances and minus tolerances has an undesirable limitation, in that the basic sizes of mating shafts and holes cannot be identical for clearance fits.

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## FLANGES FOR WAVEGUIDES

### Part 4: Relevant specifications for flanges for circular waveguides

Clause No. of IEC Publication 154-1	Item
1.	<p><b>General</b></p> <p><i>Standardized types</i></p> <p>The series of flanges for circular waveguides covered by this Recommendation is shown in Figures 1 to 4 and in Tables Ia and Ib. Flanges for preferred waveguide sizes are shown in Table Ia. Flanges for both the intermediate and preferred waveguide sizes are shown in Table Ib.</p>
1.2	<p><i>Type designation</i></p> <p>For these flanges, the type designation comprises:</p> <ul style="list-style-type: none"> <li>a) The code: 154 IEC</li> <li>b) A dash</li> <li>c) A letter relating to the basic construction of the flange, viz.: <ul style="list-style-type: none"> <li>P = pressurizable</li> <li>U = unpressurizable</li> </ul> </li> <li>d) A letter for the type according to the drawing</li> <li>e) The letter and number of the waveguide for which the flange is designed.</li> </ul> <p>Example: 154 IEC — PJC 18 denotes a pressurizable type flange for circular waveguide 153 IEC — C 18.</p>
2.	<p><b>Mechanical requirements</b></p>
2.1	<p><i>General requirements both for assemblies and for unmounted flanges</i></p> <p>It should be noted that no recommendations are made for the materials to be used for flanges for waveguides. The choice of material must be agreed on between customer and manufacturer.</p> <p>The cross-section of the circlip shown in the drawings is given for information only. The actual cross-section may assume any shape that does not adversely affect the mating of the flanges.</p>
2.1.1	<p><i>Locating holes</i></p> <p>Not applicable, because location is not effected by bolts and holes.</p>
2.1.2	<p><i>Shank diameter of fixing bolts used for location</i></p> <p>Not applicable, because location is not effected by bolts and holes.</p>
2.1.3	<p><i>Relation between shank and locating hole diameters</i></p> <p>Not applicable, because location is not effected by bolts and holes.</p>

Clause No. of IEC Publication 154-1	Item																				
2.1.4	<p><i>Over-all dimensions and thickness of flanges</i></p> <p>Shall conform to the requirements specified in Part 1 of the Recommendation.</p>																				
2.1.5	<p><i>Surface roughness of contact area of contact flanges</i></p> <p>Shall conform to the requirements specified in Part 1 of the Recommendation.</p>																				
2.1.6	<p><i>Flatness of contact area</i></p> <p>The flatness of contact area shall be better than the values given below:</p> <table border="1" data-bbox="453 703 1241 1032"> <thead> <tr> <th rowspan="2">Range of Type C waveguide size</th> <th colspan="2">Requirements</th> </tr> <tr> <th>mm</th> <th>in</th> </tr> </thead> <tbody> <tr> <td>C 14 and larger dimensions</td> <td colspan="2">For subsequent study</td> </tr> <tr> <td>C 16 to C 28.7</td> <td>0.03</td> <td>0.0012</td> </tr> <tr> <td>C 30 to C 53.9</td> <td>0.02</td> <td>0.0008</td> </tr> <tr> <td>C 56 to C 136</td> <td>0.01</td> <td>0.0004</td> </tr> <tr> <td>C 140 and smaller dimensions</td> <td colspan="2">For subsequent study</td> </tr> </tbody> </table>	Range of Type C waveguide size	Requirements		mm	in	C 14 and larger dimensions	For subsequent study		C 16 to C 28.7	0.03	0.0012	C 30 to C 53.9	0.02	0.0008	C 56 to C 136	0.01	0.0004	C 140 and smaller dimensions	For subsequent study	
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C 56 to C 136	0.01	0.0004																			
C 140 and smaller dimensions	For subsequent study																				
2.2	<p><i>General requirements for assemblies</i></p>																				
2.2.1	<p><i>Positioning of the holes</i></p> <p>Positioning of the holes shall be as shown in the figures and in the tables.</p>																				
2.2.2	<p><i>Perpendicularity of the contact area</i></p> <p>As specified in Part 1 of the Recommendation, the perpendicularity of the contact area of the flange to the axis of the waveguide shall be <math>90 \pm \frac{1}{4}^\circ</math>.</p>																				
2.3	<p><i>Additional requirements for unmounted flanges</i></p>																				
2.3.1	<p><i>General</i></p> <p>The drawings shown are for mounted flanges. In the individual drawings, the through type mounting of flanges to the waveguide is shown by way of example. This, however, does not exclude another method of mounting if the actual dimensions allow this.</p>																				
2.3.2	<p><i>Shape of aperture</i></p> <p>Shall conform to the requirements specified in Part 1 of the Recommendation.</p>																				
2.3.3	<p><i>Positioning of the holes</i></p> <p>Positioning of the holes shall be as shown in the figures and in the tables.</p>																				
2.3.4	<p><i>Ordering information</i></p> <p>When ordering unmounted flanges, an allowance should be made on certain of the specified dimensions to cover the effects of possible machining after mounting.</p>																				

## APPENDIX A

### NOTES FOR TABLE Ia (METRIC AND INCH)

1. These values are the basic (nominal) values of the outside cross-section of the waveguide according to IEC Publication 153, Hollow Metallic Waveguides, and should be regarded as nominal values for the aperture according to IEC Publication 154-1, Sub-clause 2.3.2, and they apply to unmounted flanges only.

When the outside diameters  $D_1$  of circular waveguide sizes C 18, C 22, and C 25 are standardized, it may be necessary to modify some dimensions of these flanges to ensure compatibility with the waveguide.

2. The outer diameters  $D_1$  for waveguide sizes C 30 to C 89 were increased some time after the major dimensions in this standard were approved and the gasket grooves may, in some cases, cut into the waveguide wall. It will be necessary in such cases to machine the gasket groove after assembly. Alternatively, a socket type flange could be used.
3. Each flange is comprised of a castellated ring and a part which is fixed to the waveguide. For this series of flanges, location depends on the fit between each castellated ring and both fixed parts. The diameter of the fixed part is called “shaft” in the table and the diameter of the castellated ring aperture is called “hole”. The fit between these dimensions is ISO F7/h7 for sizes C 18 up to C 140.

Example: Flange 154 IEC – PJC 18

The maximum shaft diameter is 133.00 mm (5.2362 in)  
The minimum shaft diameter is 132.960 mm (5.2346 in)  
The maximum hole diameter is 133.083 mm (5.2394 in)  
The minimum hole diameter is 133.043 mm (5.2378 in)

4. The actual position of any hole shall be within a tolerance zone diameter  $\varnothing$  of 0.4 mm (0.016 in), concentric to the theoretical position of the hole.
5. The symbol  $\odot$  indicates the maximum eccentricity of the flange dimension  $C$  with respect to the waveguide inside cross-section dimension  $D$ . (See IEC Publication 153-4, Hollow Metallic Waveguide, Part 4: Relevant Specifications for Circular Waveguides.)
6. These figures, which are given for information only, are calculated maximum values of the axial offset resulting from the most unfavourable combinations of deviations and eccentricities.