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Vacuum technology — Dimensions of non-knife edge flanges

Technique du vide — Dimensions des brides sans guillotine

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Contents

Page

Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 112, *Vacuum technology*.

This second edition cancels and replaces ISO 1609:1986, of which it constitutes a minor revision. The changes compared to the previous edition are as follows:

— The title has been updated.

— The normative reference has been updated.

— “40” in 4.1.1 has been corrected to “50”.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Vacuum technology — Dimensions of non-knife edge flanges

1 Scope

This document specifies the dimensions of non-knife-edge flanges and collars used in vacuum technology.

The dimensions ensure interchangeability between bolted, clamped and rotatable flanges:

a) whether the assembly be homogeneous (for example, bolted flanges or clamped flanges) or heterogeneous (for example, bolted flanges assembled with clamped flanges either by means of bolts or clamps or by means of bolts and rotatable flanges).

b) whether the sealing rings used with the flanges be elastomer O-rings or metal sealing rings, provided that they are compatible with the linear sealing loads given in Annex A.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
nominal bore
value intended to both identify the flange and specify the largest practical size of tubing that can be accommodated by the flange

[SOURCE: ISO 3669:2017, 3.2]

Note 1 to entry: The tables provide a series of nominal bores intended to identify the flanges or collars.

Note 2 to entry: These values follow the progression of the R10 series of preferred numbers (see ISO 3) from which only the term 12,5 has been eliminated.

Note 3 to entry: The values of nominal bore belonging to the R5 series of preferred numbers (see ISO 3) are as follows: 10, 16, 25, 40, 63, 100, 160, 250, 400, 630 and 1 000. They correspond to values intended to permit, in the long term, the adoption of a reduced series of nominal bores.

Note 4 to entry: The nominal bores 63 and 160 given in Tables 1, 2 and 3 correspond to practical diameters of 70 mm (or 65 mm) and 153 mm respectively.

3.2
diameter of bolt holes
C
value for the diameter of bolt holes

Note 1 to entry: *C* is derived from the bolt diameters, *D*, as given in ISO 273.

3.3
bolt diameter
D
diameter of the bolts

Note 1 to entry: For a flange of given nominal bore, the bolt diameter, *D*, is the same for both bolted and rotatable flanges.

3.4
mating face
area in the form of a ring, the surface finish and the flatness of which make the sealing of the joint possible.

Note 1 to entry: The minimum mating face is defined by diameter *E* in Table 1 and *S* in Table 2, and by diameter *F* in Tables 1 and 2.

Note 2 to entry: The flange sealing face shall be flat, and no part of the flange shall project in relation to this plane.

3.5
collar width
G
value for the width of the collar onto which the clamp hooks

Note 1 to entry: The value for the width depends on the system of clamps used and should not be greater than 2,5 mm.

3.6
outside diameter
H
value for the outside diameter of bolted and rotatable flanges

Note 1 to entry: The dimensions given for the outside diameter are compatible with the requirement that the bolt washers (ISO 887 – small series) shall not project beyond the outer circumference of the flange.

3.7
number of bolt holes
n
value for the number of bolt holes

Note 1 to entry: The linear sealing loads tabulated in Annex A for a given bolt stress are derived from the values of the number of bolt holes *n*.

3.8
inner diameter for the contact area of clamps
U
value for the inner diameter for the contact area of clamps

Note 1 to entry: So as to take into account the diversity of the clamping systems which may be used, for example on collars with welding necks, the maximum inner diameter of the annulus reserved for contact with the clamps is defined by diameter *U*.

4 Dimensions

4.1 General

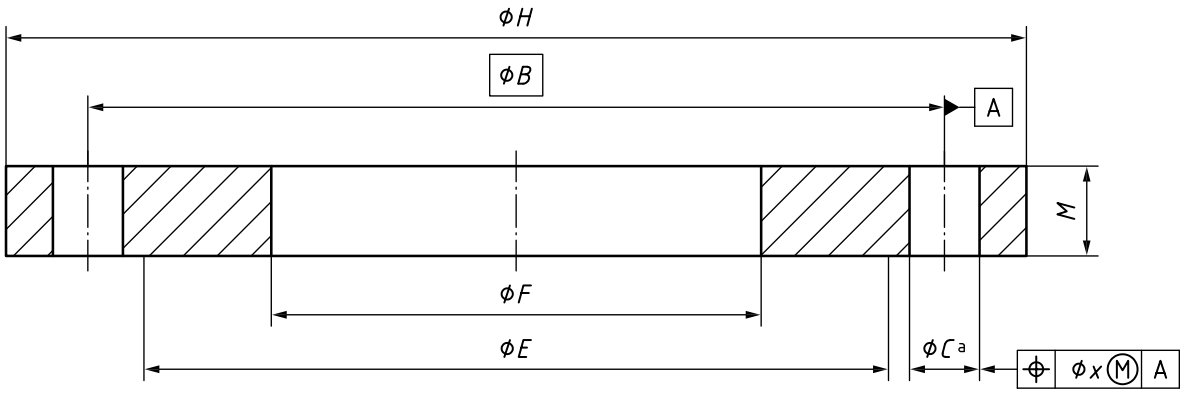
4.1.1 Dimensions of flanges and collars

The dimensions of the flanges or collars shall conform to those specified in Tables 1, 2 and 3 and shown in Figures 1, 2 and 3. These dimensions are for finished products and do not include allowance for machining. Flanges or collars with nominal bores of 10 to 50 inclusive, given in Tables 1, 2 and 3, except

the corresponding quick-release couplings specified in ISO 2861. Relevant dimensions and tolerances are specified in Annex B.

NOTE 1 The selection of materials shall be compatible with the requirements for flanges and collars used in vacuum technology and with the dimensions given in Tables 1, 2 and 3.

NOTE 2 In order to ensure the interchangeability of vacuum components, the flanges shall be aligned so that the bolt holes are spaced equidistantly about and off the symmetrical plane of the component.



a *n* holes of ø*C*.

Figure 1 — Bolted flange

Table 1 — Dimensions of bolted flanges

Dimensions in millimetres

Nominal bore[a]	*B*	*C* H13	x	Bolts		*E*[b]	*F*[b]	*H*	*M* js16
				D	*n*				
10	40	6,6	0,6	6	4	30	12,2	55	8
16	45	6,6	0,6	6	4	35	17,2	60	8
20	50	6,6	0,6	6	4	40	22,2	65	8
25	55	6,6	0,6	6	4	45	26,2	70	8
32	70	9	1	8	4	55	34,2	90	8
40	80	9	1	8	4	65	41,2	100	12
50	90	9	1	8	4	75	52,2	110	12
63	110	9	1	8	4	95	70	130	12
80	125	9	1	8	8	110	83	145	12
100	145	9	1	8	8	130	102	165	12
125	175	11	1	10	8	155	127	200	16
160	200	11	1	10	8	180	153	225	16
200	260	11	1	10	12	240	213	285	16
250	310	11	1	10	12	290	261	335	16
320	395	14	2	12	12	370	318	425	20
400	480	14	2	12	16	450	400	510	20
500	580	14	2	12	16	550	501	610	20
630	720	14	2	12	20	690	651	750	24
800	890	14	2	12	24	860	800	920	24
1 000	1 090	14	2	12	32	1 060	1 000	1120	24

[a] See 3.1. It should be noted that the nominal bores recommended above 1 000 are: 1 250, 1 600, 2 000 and 2 500.

[b] See 3.4, Note 1 to entry.

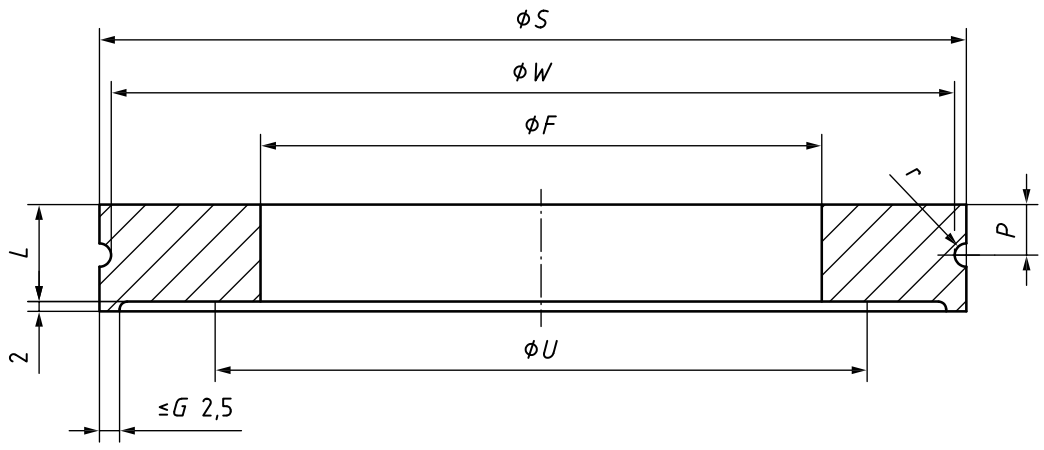


Figure 2 — Collar for clamped or rotatable flanges

Table 2 — Dimensions of collars for clamped or rotatable flanges

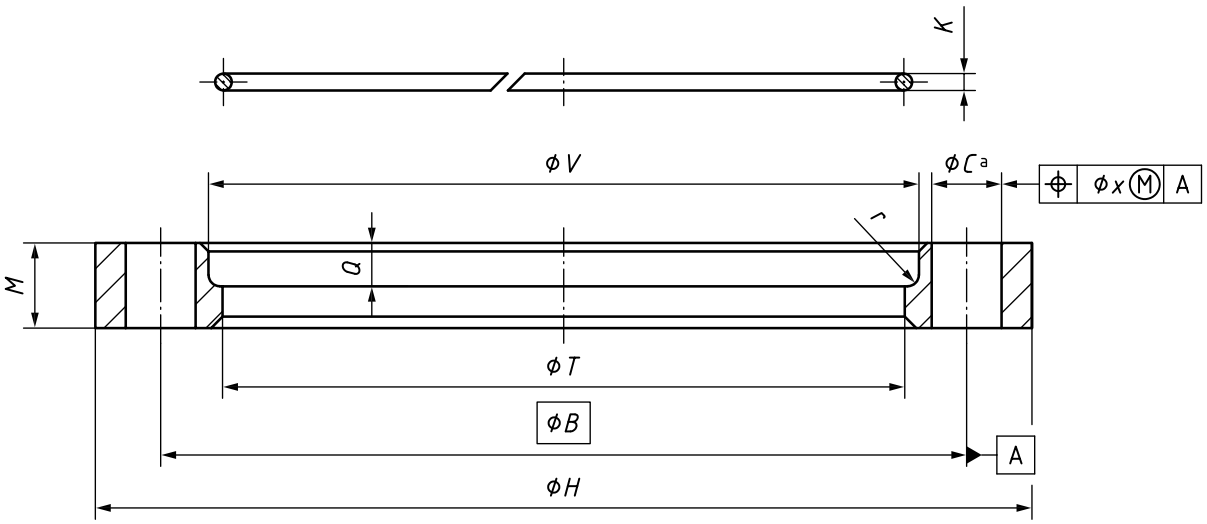
Dimensions in millimetres

Nominal bore[a]	F^b	L js16	P H14	r B10	S^b h11	U^c	W h11
10	12,2	6	3	1	30	15	28
16	17,2	6	3	1	35	20	33
20	22,2	6	3	1	40	25	38
25	26,2	6	3	1	45	30	43
32	34,2	6	3	1	55	40	53
40	41,2	10	5	1,5	65	50	62
50	52,2	10	5	1,5	75	60	72
63	70	10	5	1,5	95	80	92
80	83	10	5	1,5	110	95	107
100	102	10	5	1,5	130	115	127
125	127	10	5	2,5	155	140	150
160	153	10	5	2,5	180	165	175
200	213	10	5	2,5	240	225	235
250	261	10	5	2,5	290	275	285
320	318	15	7,5	2,5	370	355	365
400	400	15	7,5	4	450	435	442
500	501	15	7,5	4	550	535	542
630	651	20	10	5	690	660	680

[a] See 3.1. It should be noted that the nominal bores recommended above 1 000 are: 1 250, 1 600, 2 000 and 2 500.

[b] See 3.4, Note 1 to entry.

[c] See 3.8.



[a] *n* holes of ø*C*.

Figure 3 — Rotatable flange with retaining ring

NOTE The diameter of the retaining ring shall be compatible with the dimension *V*.