
**Thermoplastics piping systems for
fluids under pressure — Flange
adapters and loose backing flanges —
Mating dimensions**

*Systèmes de canalisations thermoplastiques pour fluides sous
pression — Collets et brides folles plates — Dimensions de
raccordement*

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 2, *Plastics pipes and fittings for water supplies*.

This second edition cancels and replaces the first edition (ISO 9624:1997), which has been technically revised.

The main changes compared to the previous edition are:

- increase of dimensions up to 2 500 mm;
- technical consistency with industrial applications standards;
- addition of two informative annexes on gaskets and torque application.

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.

Introduction

This document covers the dimensions of flange adapters and loose backing flanges which are commonly used in the connection of plastic piping systems to valves, pumping stations or other equipment, and to pipelines of the same or other material. Some equipment (e.g. butterfly valves) may require specific designs that are not covered by this document.

This revised version of this document covers dimensions allowing the connection of plastic piping systems up to DN 2500, to answer the increasing demand of large dimensions on the market.

Flanged joints should be able to transfer long-term axial forces with maintained tightness, which requires use of suitable components and a correct assembly. This revised version includes informative annexes addressing joint design and torque application and gives bibliographic references to installation guidelines which are available on the market.

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Thermoplastics piping systems for fluids under pressure — Flange adapters and loose backing flanges — Mating dimensions

1 Scope

This document specifies the mating dimensions for thermoplastic flange adapters and corresponding loose backing flanges intended to be used in thermoplastic piping systems for the conveyance of fluids under pressure.

It applies to flange adapters and loose backing flanges for use with pipes with nominal outside diameters (d_n) from 16 mm to 2 500 mm and nominal pressures up to 25 bar¹⁾ (PN 25).

This document specifies the dimensions of the flange adapters intended to be used for:

- butt fusion piping systems;
- socket fusion piping systems;
- adhesive jointed piping systems.

NOTE 1 For specific connections with dimensions (e.g. $d_n 450$ or $d_n 630$) not covered in this document, or specific equipment (butterfly valves), specific solutions are available on the market.

This document is applicable to loose backing flanges made from metal, thermoplastics, or a combination of metal and thermoplastics.

This document also provides information on gaskets and gives general recommendations on correct assembling practices.

NOTE 2 Industrial applications are not covered by this document. Products intended for industrial application are covered by ISO 15493^[1], ISO 15494 or ISO 10931^[2].

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.

ISO 261, *ISO general purpose metric screw threads — General plan*

ISO 727-1, *Fittings made from unplasticized poly(vinyl chloride) (PVC-U), chlorinated poly(vinyl chloride) (PVC-C) or acrylonitrile/butadiene/styrene (ABS) with plain sockets for pipes under pressure — Part 1: Metric series*

ISO 1452-3, *Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure — Unplasticized poly(vinyl chloride) (PVC-U) — Part 3: Fittings*

ISO 4427-3, *Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 3: Fittings*

ISO 7005-1, *Pipe flanges — Part 1: Steel flanges for industrial and general service piping systems*

1) 1 bar = 0,1 MPa = 10⁵ N/m².

ISO 15494, *Plastics piping systems for industrial applications — Polybutene (PB), polyethylene (PE), polyethylene of raised temperature resistance (PE-RT), crosslinked polyethylene (PE-X), polypropylene (PP) — Metric series for specifications for components and the system*

ISO 15874-3, *Plastics piping systems for hot and cold water installations — Polypropylene (PP) — Part 3: Fittings*

EN 1092-1, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: steel flanges*

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:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

nominal outside diameter

d_n

specified outside diameter, in millimetres, assigned to a nominal size DN/OD

Note 1 to entry: The nominal outside diameter d_n of pipes is given in ISO 161-1^[3].

3.2

nominal size

DN

numerical designation of the size of a flange for reference purposes and only loosely related to manufacturing dimensions

3.3

nominal pressure

PN

numerical designation used for reference purposes related to the mechanical characteristics of the component of a piping system

Note 1 to entry: For plastic piping systems conveying water (including flange adapters), the PN symbols correspond to the allowable operating pressure (PFA) in bar, which can be sustained with water at 20 °C with a design basis of 50 years, and based on the minimum design coefficient in accordance with ISO 12162^[4]. For loose backing flanges, the PN symbol is used to indicate its geometrical characteristics.

4 Symbols and abbreviated terms

d_n nominal (outside) diameter of connecting pipe and flange adapters, and
nominal (inside) diameter of the socket

D outside diameter of loose backing flange

DN size designation of loose backing flange

D_1 bolt hole diameter

D_2 inside diameter of loose backing flange

D_3 pitch circle diameter

D_4	outside diameter of flange adapter head
D_5	outside diameter of flange adapter shank
n	number of bolt holes
r_f	radius of shoulder of flange adapter

5 Dimensions

5.1 General

Loose backing flanges shall be designated by the relevant PN symbol, in consistency with [Table 2](#) to [Table 4](#), [Table 6](#) or [Table 8](#) as appropriate.

NOTE 1 The values of the outside diameter D of the loose backing flange and the pitch circle diameter D_3 of the bolts are taken from EN 1092-1.

NOTE 2 The values of the bolt hole diameter D_1 are taken from series medium in ISO 273.

The inside diameter D_2 of the loose backing flange shall conform to the design of the flange adapter.

Unless otherwise specified, the diameters of the flange adapters as specified in [Table 1](#), [Table 5](#) and [Table 7](#) shall be suitable with the corresponding loose backing flanges, and therefore comply with ISO 7005-1 using the appropriate tolerances as given in EN 1092-1.

Flange adapters shall be designed in order to prevent stress concentration at any changes in cross section. The thickness of the flange adapter face and loose backing flange shall be dependent on the material used in the manufacture of the adapter and on the nominal pressure (PN) of the piping system for which it is designed.

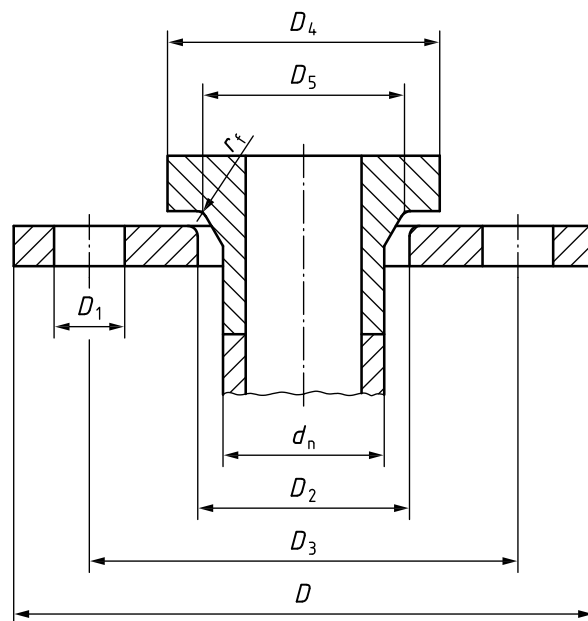
Flange adapters according to [Table 1](#) shall be associated with flanges of same d_n , from [Tables 2, 3](#) or [4](#) as relevant.

NOTE 3 The figures are schematic only, to indicate the relevant dimensions. They do not necessarily represent manufactured components, e.g. flange adapter with special geometry for connecting butterfly valves.

5.2 Butt fusion systems

The dimensions of the spigot ends shall comply with the relevant pipe system standard, e.g. ISO 4427-3.

All dimensions shall be measured in accordance with [Figure 1](#).

**Key**

- d_n nominal (outside) diameter of connecting pipe and nominal (inside) diameter of the socket
 D outside diameter of loose backing flange
 D_1 bolt hole diameter
 D_2 inside diameter of loose backing flange
 D_3 pitch circle diameter
 D_4 outside diameter of flange adapter head
 D_5 outside diameter of flange adapter shank
 r_f radius of shoulder of flange adapter

Figure 1 — Butt fusion systems

For butt fusion systems, the dimensions of the flange adapters shall conform to those given in [Table 1](#).

Table 1 — Flange adapters — Dimensions for butt fusion systems

Nominal outside diameter of pipe and spigot ^a	Outside diameter of flange adapter head ^b	Outside diameter of flange adapter shank ^c	Radius of shoulder of flange adapter
d_n	$D_{4 \text{ min}}$	$D_{5 \text{ min}}$	r_f (+0,5 / -0,5)
16	40	22	3
20	45	27	3
25	58	33	3
32	68	40	3
40	78	50	3
50	88	61	3
63	102	75	4
75	122	89	4

^a The diameter of the spigot shall conform to the relevant product standard.

^b The actual value of D_4 should be as high as possible to ensure fitness for purpose of the assembly. See [Annex C](#) for higher recommended values of D_4 for PE100 flange adapters.

^c D_5 shall be measured in the middle of the radius r_f .

Table 1 (continued)

Nominal outside diameter of pipe and spigot ^a	Outside diameter of flange adapter head ^b	Outside diameter of flange adapter shank ^c	Radius of shoulder of flange adapter r_f (+0,5 / -0,5)
d_n	$D_{4 \text{ min}}$	$D_{5 \text{ min}}$	
90	138	105	4
110	158	125	4
125	158	132	4
140	188	155	4
160	212	175	4
180	212	183	4
200	268	232	4
225	268	235	4
250	320	285	4
280	320	291	4
315	370	335	4
355	430	373	6
400	482	427	6
450	585	514	6
500	585	530	6
560	685	615	6
630	685	642	6
710	800	737	8
800	905	840	8
900	1 005	944	8
1 000	1 110	1 047	8
1 200	1 330	1 245	8
1 400	1 540	1 450	8
1 600	1 760	1 650	10
1 800	1 960	1 860	10
2 000	2 170	2 070	10
2 250	2 435	2 320	10
2 500	2 730	2 550	10

^a The diameter of the spigot shall conform to the relevant product standard.

^b The actual value of D_4 should be as high as possible to ensure fitness for purpose of the assembly. See [Annex C](#) for higher recommended values of D_4 for PE100 flange adapters.

^c D_5 shall be measured in the middle of the radius r_f .

The dimensions of PN 10 designated loose backing flanges shall conform to those given in [Table 2](#).

Table 2 — PN 10 designated loose backing flange dimensions for butt fusion systems

DN	Nominal outside diameter of pipe d_n	PN 10 designated loose backing flanges					
		Outside diameter D_{min}	Inside diameter D_2	Pitch circle diameter D_3	Bolts		
					Bolt hole diameter D_1	Number n	Screw thread ^a
10	16	90	23	60	14	4	M12
15	20	95	28	65	14	4	M12
20	25	105	34	75	14	4	M12
25	32	115	42	85	14	4	M12
32	40	140	51	100	18	4	M16
40	50	150	62	110	18	4	M16
50	63	165	78	125	18	4	M16
65	75	185	92	145	18	4	M16
80	90	200	108	160	18	8	M16
100	110	220	128	180	18	8	M16
100	125	220	135	180	18	8	M16
125	140	250	158	210	18	8	M16
150	160	285	178	240	22	8	M20
150	180	285	188	240	22	8	M20
200	200	340	235	295	22	8	M20
200	225	340	238	295	22	8	M20
250	250	395	288	350	22	12	M20
250	280	395	294	350	22	12	M20
300	315	445	338	400	22	12	M20
350	355	505	376	460	22	16	M20
400	400	565	430	515	26	16	M24
500	450	670	517	620	26	20	M24
500	500	670	533	620	26	20	M24
600	560	780	618	725	30	20	M27
700	630	895	645	840	30	24	M27
700	710	895	740	840	30	24	M27
800	800	1 015	843	950	33	24	M30
900	900	1 115	947	1 050	33	28	M30
1 000	1 000	1 230	1 050	1 160	36	28	M33
1 200	1 200	1 455	1 260	1 380	39	32	M36
1 400	1 400	1 675	1 470	1 590	42	36	M39
1 600	1 600	1 915	1 670	1 820	48	40	M45
1 800	1 800	2 115	1 875	2 020	48	44	M45
2 000	2 000	2 325	2 085	2 230	48	48	M45
2 250 ^b	2 250	2 610	2 335	2 495	56	52	M52
2 500 ^b	2 500	2 960	2 570	2 804	56	60	M52

^a Metric screw thread sizes in millimetres conforming to ISO 261.

^b These dimensions are not specified in EN 1092-1.

The dimensions of PN 16 designated loose backing flanges shall conform to those given in [Table 3](#).

Table 3 — PN 16 designated loose backing flange dimensions for butt fusion systems

DN ^a	Nominal outside diameter of pipe d_n	PN 16 designated loose backing flanges					
		Outside diameter D_{min}	Inside diameter D_2	Pitch circle diameter D_3	Bolts		
					Bolt hole diameter D_1	Number n	Screw thread ^b
200	200	340	235	295	22	12	M20
200	225	340	238	295	22	12	M20
250	250	405	288	355	26	12	M24
250	280	405	294	355	26	12	M24
300	315	460	338	410	26	12	M24
350	355	520	376	470	26	16	M24
400	400	580	430	525	30	16	M27
500	450	715	517	650	33	20	M30
500	500	715	533	650	33	20	M30
600	560	840	618	770	36	20	M33
700	630	910	645	840	36	24	M33
700	710	910	740	840	36	24	M33
800	800	1 025	843	950	39	24	M36
900	900	1 125	947	1 050	39	28	M36
1 000	1 000	1 255	1 050	1 170	42	28	M39
1 200	1 200	1 485	1 260	1 390	48	32	M45
1 400	1 400	1 685	1 470	1 590	48	36	M45
1 600	1 600	1 930	1 670	1 820	56	40	M52

^a For loose backing flanges up to and including size DN 150, dimensions shall be as given in Table 2.

^b Metric screw thread sizes in millimetres conforming to ISO 261.

The dimensions of PN 25 designated loose backing flanges shall conform to those given in Table 4.

Table 4 — PN 25 designated loose backing flange dimensions for butt fusion systems

DN ^a	Nominal outside diameter of pipe d_n	PN 25 designated loose backing flanges					
		Outside diameter D_{min}	Inside diameter D_2	Pitch circle diameter D_3	Bolts		
					Bolt hole diameter D_1	Number n	Screw thread ^b
100	110	235	128	190	22	8	M20
100	125	235	135	190	22	8	M20
125	140	270	158	220	26	8	M24
150	160	300	178	250	26	8	M24
150	180	300	188	250	26	8	M24
200	200	360	235	310	26	12	M24
200	225	360	238	310	26	12	M24
250	250	425	288	370	30	12	M27
250	280	425	294	370	30	12	M27
300	315	485	338	430	30	16	M27

^a For loose backing flanges up to and including size DN 80, dimensions shall be as given in Table 2.

^b Metric screw thread sizes in millimetres conforming to ISO 261.

Table 4 (continued)

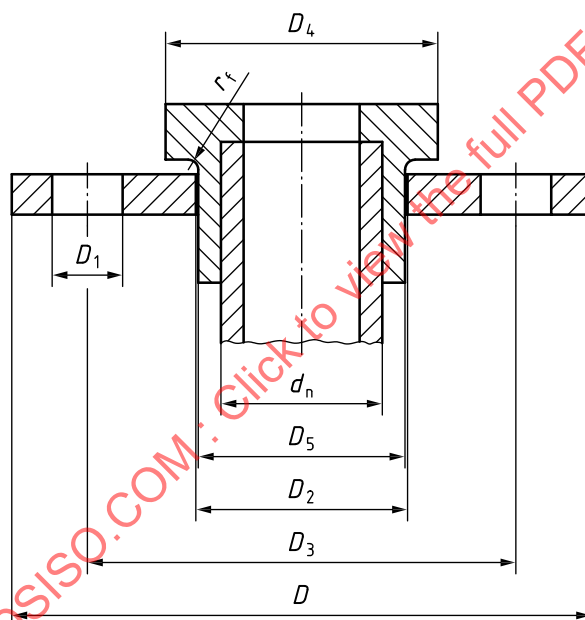
DN ^a	Nominal outside diameter of pipe d_n	PN 25 designated loose backing flanges					
		Outside diameter D_{min}	Inside diameter D_2	Pitch circle diameter D_3	Bolts		
					Bolt hole diameter D_1	Number n	Screw thread ^b
350	355	555	376	490	33	16	M30
400	400	620	430	550	36	16	M33
500	450	730	517	660	36	20	M33
500	500	730	533	660	36	20	M33

^a For loose backing flanges up to and including size DN 80, dimensions shall be as given in Table 2.

^b Metric screw thread sizes in millimetres conforming to ISO 261.

5.3 Socket fusion systems

All dimensions shall be measured in accordance with Figure 2.



Key

- d_n nominal (outside) diameter of connecting pipe and nominal (inside) diameter of the socket
- D outside diameter of loose backing flange
- D_1 bolt hole diameter
- D_2 inside diameter of loose backing flange
- D_3 pitch circle diameter
- D_4 outside diameter of flange adapter head
- D_5 outside diameter of flange adapter shank
- r_f radius of shoulder of flange adapter

Figure 2 — Socket fusion systems

For socket fusion systems, the dimensions of the flange adapter shall conform to those given in Table 5.

Table 5 — Flange adapters — Dimensions for socket fusion systems

Nominal diameter of socket ^a	Outside diameter of flange adapter head	Outside diameter of flange adapter shank
d_n	$D_{4 \min}$	$D_{5 \min}$
16	40	22
20	45	27
25	58	33
32	68	41
40	78	50
50	88	61
63	102	76
75	122	90
90	138	108
110	158	131
^a Socket dimensions shall conform to the following standards as applicable: — ISO 4427-3 for PE; — ISO 15874-3 or ISO 15494 for PP.		

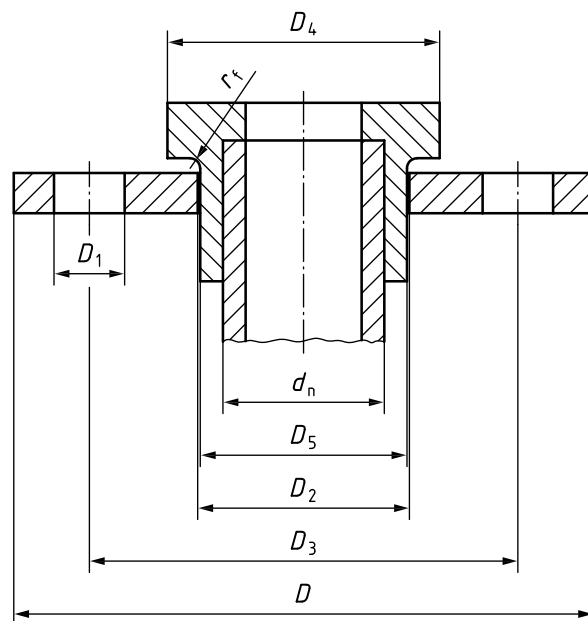
For socket fusion systems, the dimensions of the loose backing flanges shall conform to those given in [Table 6](#).

Table 6 — PN 10 and PN 16 designated loose backing flanges — Dimensions for socket fusion systems

DN	Nominal outside diameter of pipe	Outside diameter	Inside diameter ^{a,b}	Pitch circle diameter	Bolts		
					Bolt hole diameter	Number	Screw thread ^c
	d_n	$D_{\min}$	D_2	D_3	D_1	n	
10	16	90	23	60	14	4	M12
15	20	95	28	65	14	4	M12
20	25	105	34	75	14	4	M12
25	32	115	42	85	14	4	M12
32	40	140	51	100	18	4	M16
40	50	150	62	110	18	4	M16
50	63	165	78	125	18	4	M16
65	75	185	92	145	18	4	M16
80	90	200	110	160	18	8	M16
100	110	220	133	180	18	8	M16
^a These are standard steel flange dimensions. In some cases, different values may be used for D_2 . ^b Recommended permissible deviation for D_2 : $\Delta D_2 = +0 / -0,5$ when $D_2 \leq 62$ mm $\Delta D_2 = +0 / -1$ when $D_2 > 62$ mm ^c Metric screw thread sizes in millimetres conforming to ISO 261.							

5.4 Adhesive bonded systems

All dimensions shall be measured in accordance with [Figure 3](#).

**Key**

- d_n nominal (outside) diameter of connecting pipe and nominal (inside) diameter of the socket
 D outside diameter of loose backing flange
 D_1 bolt hole diameter
 D_2 inside diameter of loose backing flange
 D_3 pitch circle diameter
 D_4 outside diameter of flange adapter head
 D_5 outside diameter of flange adapter shank
 r_f radius of shoulder of flange adapter

Figure 3 — Adhesive bonded systems

For adhesive bonded systems, the dimensions of the flange adapter shall conform to those given in [Table 7](#).

Table 7 — Flange adapters — Dimensions for adhesive bonded systems

Nominal diameter of socket ^a	Outside diameter of flange adapter head	Outside diameter of flange adapter shank
d_n	$D_{4 \min}$	$D_{5 \min}$
16	29	22
20	34	27
25	41	33
32	50	41
40	61	50
50	73	61
63	90	76
75	105	90
90	125	108
110	150	131
125	168	148

^a Socket dimensions shall conform to ISO 727-1, ISO 1452-3 or ISO 15493.

Table 7 (continued)

Nominal diameter of socket ^a	Outside diameter of flange adapter head	Outside diameter of flange adapter shank
d_n	$D_{4\min}$	$D_{5\min}$
140	188	165
160	212	188
180	247	201
200	250	224
225	273	245
250	303	270
280	327	307
315	377	346
355	430	384
400	482	438

^a Socket dimensions shall conform to ISO 727-1, ISO 1452-3 or ISO 15493.

For adhesive bonded systems, the dimensions of the loose backing flanges shall conform to those given in Table 8.

Table 8 — PN 10 designated loose backing flanges — Dimensions for adhesive bonded systems

DN	Nominal outside diameter of pipe d_n	PN 10 designated loose backing flanges ^a					
		Outside diameter $D_{\min}$	Inside diameter ^{b,c} D_2	Pitch circle diameter D_3	Bolts		
					Bolt hole diameter D_1	Number n	Screw thread ^d
10	16	90	23	60	14	4	M12
15	20	95	28	65	14	4	M12
20	25	105	34	75	14	4	M12
25	32	115	42	85	14	4	M12
32	40	140	51	100	18	4	M16
40	50	150	62	110	18	4	M16
50	63	165	78	125	18	4	M16
65	75	185	92	145	18	4	M16
80	90	200	110	160	18	8	M16
100	110	220	133	180	18	8	M16
125	125	250	150	210	18	8	M16
125	140	250	167	210	18	8	M16
150	160	285	190	240	22	8	M20
175	180	315	203	240	22	8	M20
200	200	340	226	295	22	8	M20
200	225	340	250	295	22	8	M20

^a Up to and including DN150, the dimensions of the flanges are also applicable to PN 16 designated flanges.

^b These are standard steel flange dimensions. In some cases, different values may be used for D_2 .

^c Recommended permissible deviation for D_2 :

$\Delta D_2 = +0 / -0,5$ when $D_2 \leq 62$ mm

$\Delta D_2 = +0 / -1$ when $D_2 > 62$ mm

^d Metric screw thread sizes in millimetres conforming to ISO 261.

Table 8 (continued)

DN	Nominal outside diameter of pipe d_n	PN 10 designated loose backing flanges ^a					
		Outside diameter D_{min}	Inside diameter ^{b,c} D_2	Pitch circle diameter D_3	Bolts		
					Bolt hole diameter D_1	Number n	Screw thread ^d
250	250	370	277	325	22	8	M20
250	280	395	310	350	22	12	M20
300	315	445	348	400	22	12	M20
355	355	505	388	460	22	16	M20
400	400	565	442	515	26	16	M24
^a Up to and including DN150, the dimensions of the flanges are also applicable to PN 16 designated flanges. ^b These are standard steel flange dimensions. In some cases, different values may be used for D_2 . ^c Recommended permissible deviation for D_2 : $\Delta D_2 = +0 / -0,5$ when $D_2 \leq 62$ mm $\Delta D_2 = +0 / -1$ when $D_2 > 62$ mm ^d Metric screw thread sizes in millimetres conforming to ISO 261.							

6 Gaskets

The gasket material shall be chemically and thermally compatible with the fluid in the pipe, and have an appropriate hardness. Gaskets are often made of rubber materials, but some other materials are also approved for use.

Attention is drawn to the joint design in order to allow the gasket to maintain its elastic behaviour.

7 Marking

7.1 Minimum required marking of flange adapters

Flange adapters shall be legibly marked in such a way that the marking does not initiate cracks or other types of failure. If ink printing is used, the colour of the printed information shall differ from the basic colour of the product.

The marking shall be such that it is legible without magnification.

NOTE The manufacturer is not responsible for marking that is illegible owing to actions caused during installation and use such as painting, scratching, covering of components or using detergents, etc. on the components unless agreed or specified by the manufacturer.

There shall be no marking over the minimum spigot length of the fitting.

The minimum required marking shall be in accordance with [Table 9](#).

Table 9 — Minimum required marking of flange adapters

Aspect	Marking
Standard number ^a	ISO 9624
Size designation of flange adapter, d_n	e.g. d_n 250
SDR series ^b	e.g. SDR17
Material and designation ^a	e.g. PE 100
Manufacturer identification	Name or symbol
Traceability element (production date or code) ^a	e.g. 0216
^a Marking may be affixed on a label, or on the packaging, or in the technical documentation.	
^b Not applicable for PVC material.	

7.2 Minimum required marking of loose backing flanges

Loose backing flanges shall be legibly marked in such a way that the marking does not initiate cracks or other types of failure. If ink printing is used, the colour of the printed information shall differ from the basic colour of the product.

The marking shall be such that it is legible without magnification.

NOTE The manufacturer is not responsible for marking that is illegible owing to actions caused during installation and use such as painting, scratching, covering of components or using detergents, etc. on the components unless agreed or specified by the manufacturer.

The minimum required marking shall be in accordance with [Table 10](#).

Table 10 — Minimum required marking of loose backing flanges

Aspect	Marking
Standard number ^a	ISO 9624
Size designation of loose backing flange, DN ^a	e.g. DN250
Pressure rating, PN	e.g. PN 16
Manufacturer identification	Name or symbol
Traceability element (production date or code) ^a	e.g. 0216
^a Marking may be affixed on a label, or on the packaging, or in the technical documentation.	

Annex A (informative)

Gaskets

Different types of gaskets may require different sealing pressures to ensure joint tightness.

The necessary sealing pressure for the gasket is normally proportional to the internal pressure in the pipe. As a rough rule of thumb, the sealing pressure should be at least twice the maximum internal pressure in the pipe.

Re-tightening during the installation or during the service regularly will normally decrease the risk for leakage. However, the selection of gasket type is important and will influence the performance of the joint. Drop-in steel core gaskets with or without integrated O-ring ([Figure A.1](#)) have been shown to have better performance than other types of gaskets.

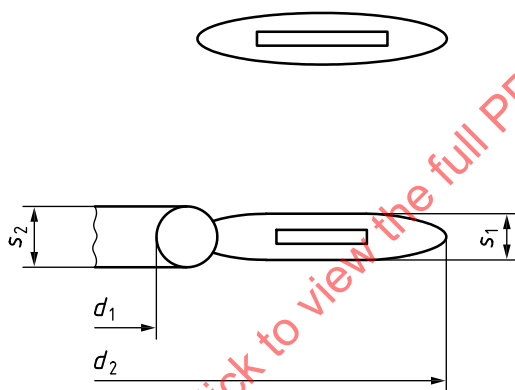


Figure A.1 — Typical steel core gasket design