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Thermoplastics pipes for fluids under pressure — Mating dimensions of flange adapters and loose backing flanges

*Tubes en matières thermoplastiques destinés à la pression — Dimensions
des collets et dimensions de raccordement des brides folles plates*

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Foreword

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International Standard ISO 9624 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*.

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Thermoplastics pipes for fluids under pressure — Mating dimensions of flange adapters and loose backing flanges

1 Scope

This International Standard specifies the mating dimensions of flange adaptors of thermoplastic materials and the corresponding dimensions of loose backing flanges to be used with thermoplastic pipes under pressure.

It applies to flange adaptors and loose backing flanges for use with pipes with nominal outside diameters d_n from 16 mm to 1 200 mm and nominal pressures up to 16 bar¹⁾ (PN 16).

Tables 2 and 3 specify dimensions for socket fusion systems of polyethylene (PE) and polypropylene (PP) and solvent-cemented systems of unplasticized poly(vinyl chloride) (PVC-U), chlorinated poly(vinyl chloride) (PVC-C) and acrylonitrile/butadiene/styrene (ABS).

Tables 3 to 5 specify dimensions for butt fusion systems of polyethylene (PE) and polypropylene (PP).

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 161-1:1996, *Thermoplastic pipes for the conveyance of fluids — Nominal outside diameters and nominal pressures — Part 1: Metric series.*

ISO 261:1973, *ISO general purpose metric screw threads — General plan.*

ISO 273:1979, *Fasteners — Clearance holes for bolts and screws.*

ISO 727:1985, *Fittings of unplasticized polyvinyl chloride (PVC-U), chlorinated polyvinyl chloride (PVC-C) or acrylonitrile/butadiene/styrene (ABS) with plain sockets for pipes under pressure — Dimensions of sockets — Metric series.*

ISO 7005-1:1992, *Metallic flanges — Part 1: Steel flanges.*

ISO 7279:1984, *Polypropylene (PP) fittings for pipes under pressure — Sockets for fusion using heated tools — Metric series — Dimensions of sockets.*

ISO 8085-1:—²⁾, *Polyethylene fittings for use with polyethylene pipes for the supply of gaseous fuels — Metric series — Specifications — Part 1: Fittings for socket fusion using heated tools.*

1) 1 bar = 10^5 N/m² = 0,1 MPa

2) To be published.

3 Definitions

For the purposes of this International Standard, the following definitions apply:

3.1 nominal outside diameter, d_n : A numerical designation of size which is common to all components in a thermoplastics piping system other than flanges and components designated by thread size. It is a convenient round number for reference purposes.

3.2 nominal diameter (DN): A numerical designation of size of a flange for reference purposes and only loosely related to manufacturing dimensions.

3.3 nominal pressure (PN):

NOTES

1 The relevant definition of nominal pressure (PN) is given in ISO 161-1 and relates to pipes, fittings (flange adaptors) and components made of thermoplastic materials.

2 The nominal pressure of the flange is used to indicate its geometrical requirements.

The maximum admissible operating pressure of the pipeline to which the flange is connected may vary from the nominal pressure depending upon the operating conditions, particularly in the case of pipelines for gas, chemicals or industrial liquids.

4 Symbols

For the purposes of this International Standard, the following symbols apply:

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

D outside diameter of loose backing flange

DN size designation of 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 adaptor head

D_5 outside diameter of flange adaptor shank

n number of bolt holes

5 Dimensions

5.1 For socket fusion and solvent-cemented systems, the dimensions of the flange adaptor shall conform to those given in table 1. The dimensions of the loose backing flanges shall conform to those given in table 2 for nominal pressure PN 10 (see also figure 1).

NOTE — The thickness of the flange adaptor face will be dependent on the material used in the manufacture of the adaptor and on the nominal pressure for which it is designed.

5.2 For butt fusion systems, the dimensions of the flange adaptors shall conform to those given in table 3. The dimensions at the loose backing flanges shall conform to those given in table 4 for nominal pressure PN 10 and to those given in table 5 for nominal pressure PN 16 (see also figure 2).

NOTE — The thickness of the flange adaptor face will be dependent on the material used in the manufacture of the adaptor and on the nominal pressure for which it is designed.

5.3 The nominal outside diameter d_n of the pipe shall conform to ISO 161-1.

The outside diameter D of the loose backing flange shall conform to ISO 7005-1.

The pitch circle diameter D_3 of the bolts shall conform to ISO 7005-1.

The bolt hole diameter D_1 shall conform to ISO 273.

The inside diameter D_2 of the loose backing flange shall conform to the design of the flange adaptor. In some applications, values of the inside diameter of the loose backing flange differing from those given in the tables may be used.

NOTE — The thickness of the loose backing flanges will be dependent on the material used in the manufacture of the flange and on the nominal pressure (PN) for which it is designed.

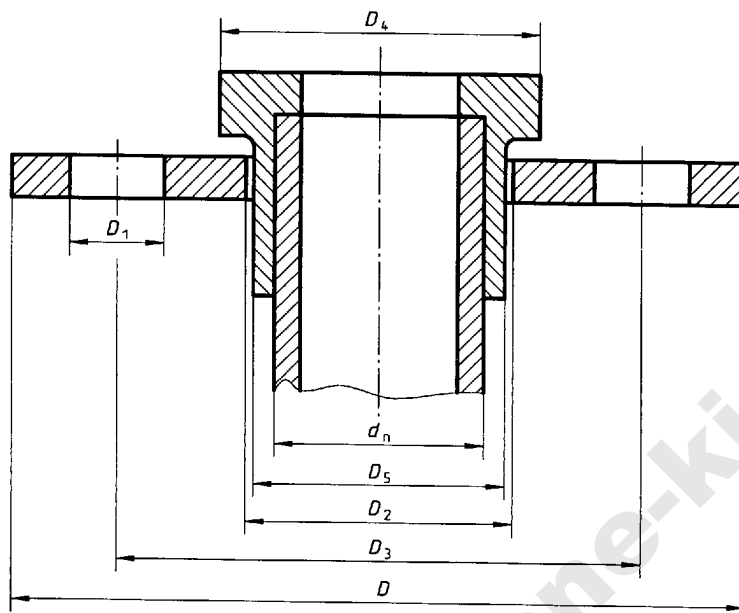


Figure 1 — Socket fusion and solvent-cemented systems

Table 1 — Flange adaptors — Dimensions for socket fusion and solvent-cemented systems

Dimensions in millimetres

Nominal diameter of socket d_n	D_5	D_4 min.
16	$22 \pm 0,1$	29
20	$27 \pm 0,15$	34
25	$33 \pm 0,15$	41
32	$41 \pm 0,2$	50
40	$50 \pm 0,2$	61
50	$61 \pm 0,2$	73
63	$76 \pm 0,3$	90
75	$90 \pm 0,3$	106
90	$108 \pm 0,3$	125
110	$131 \pm 0,3$	150
125	$148 \pm 0,4$	170
140	$165 \pm 0,4$	188
160	$188 \pm 0,4$	213
200	$224 \pm 0,4$	250
225	$248 \pm 0,4$	274
250	$270 \pm 0,5$	306
280	$305 \pm 0,5$	329
315	$342 \pm 0,5$	380

NOTE — Socket dimensions shall conform to the following standards as applicable:
 ISO 727 for PVC-U, PVC-C and ABS
 ISO 7279 for PP
 ISO 8085-1 for PE

Table 2 — Loose backing flange dimensions — Nominal pressure PN 10 for socket fusion and solvent-cemented systems

Dimensions in millimetres

DN	Nominal outside diameter of pipe d_n	Loose backing flanges					
		Outside diameter D	Inside diameter ¹⁾²⁾ D_2	Pitch circle diameter D_3	Bolts		
					Bolt hole diameter D_1	Number n	Screw thread ³⁾
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
200	200	340	226	295	22	8	M20
200	225	340	250	295	22	8	M20
250	280	395	310	350	22	12	M20
300	315	445	348	400	22	12	M20

- 1) These are standard steel flange dimensions. In some cases, different values may be used for D_2 .
- 2) Recommended permissible deviation for D_2 :
 $\Delta D_2 = -\frac{0}{0.5}$ when $D_2 \leq 62$ mm
 $\Delta D_2 = -\frac{0}{1}$ when $D_2 > 62$ mm
- 3) Metric screw thread sizes in millimetres conforming to ISO 261.

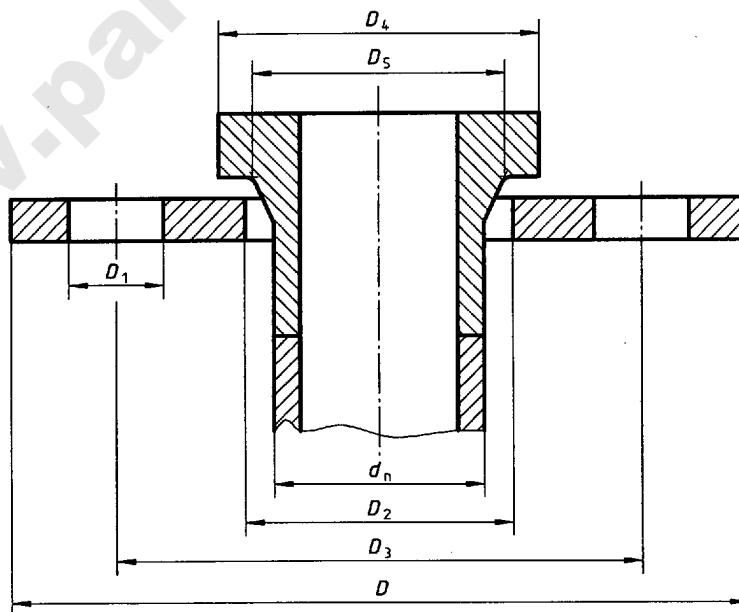


Figure 2 — Butt fusion systems

Table 3 — Flange adaptors — Dimensions for butt fusion systems

Dimensions in millimetres

Nominal outside diameter of pipe and spigot d_n	D_4 min.	D_5
20	45	27
25	58	33
32	68	40
40	78	50
50	88	61
63	102	75
75	122	89
90	138	105
110	158	125
125	158	132
140	188	155
160	212	175
180	212	180
200	268	232
225	268	235
250	320	285
280	320	291
315	370	335
355	430	373
400	482	427
450	585	514
500	585	530
560	685	615
630	685	642
710	800	737
800	905	840
900	1 005	944
1 000	1 110	1 047
1 200	1 330	1 245

1) The diameter of the spigot shall conform to the relevant product standard.

Table 4 — Loose backing flanges for butt fusion systems — Nominal pressure PN 10

Dimensions in millimetres

DN	Nominal outside diameter of pipe d_n	Loose backing flanges					
		Outside diameter D	Inside diameter D_2	Pitch circle diameter D_3	Bolts		
					Bolt hole diameter D_1	Number n	Screw thread ¹⁾
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
450	450	615	470	565	26	20	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
600	630	780	645	725	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) Metric screw thread sizes in millimetres conforming to ISO 261.

Table 5 — Loose backing flanges for butt fusion systems — Nominal pressure PN 16

Dimensions in millimetres

DN ¹⁾	Nominal outside diameter of pipe d_n	Loose backing flanges					
		Outside diameter D	Inside diameter D_2	Pitch circle diameter D_3	Bolts		
					Bolt hole diameter D_1	Number n	Screw thread ²⁾
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
450	450	670	517	585	30	20	M27
500	500	715	533	650	33	20	M30
600	560	840	618	770	36	20	M33
600	630	840	645	770	36	20	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	1 230	1 050	1 170	42	28	M39
1 200	1 200	1 455	1 260	1 390	48	32	M45

1) For loose backing flanges up to and including size DN 200, dimensions shall be as given in table 4.
2) Metric screw thread sizes in millimetres conforming to ISO 261.

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