INTERNATIONAL STANDARD

ISO 10806

Second edition
2003-11-15

Pipework — Fittings for corrugated metal hoses

Tuyauteries — Raccords pour tuyaux métalliques flexibles onduleux

Reference number
ISO 10806:2003(E)

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

ISO 10806 was prepared by Technical Committee ISO/TC 5, *Ferrous metal pipes and metallic fittings*, Subcommittee SC 11, *Metal hoses and expansion joints*.

This second edition cancels and replaces the first edition (ISO 10806:1994), which has been technically revised.

Introduction

It was decided to produce a standard under the Vienna agreement on technical cooperation between ISO and the European Committee for Standardization (CEN) in order to maintain one standard. The opportunity was taken to add additional information not available for the first edition of ISO 10806.

The major changes are:

— addition of a clause on design;

— revision of the type descriptions and the symbols;

— addition of conical nipples and adaptors;

— addition of three series of fixed flanges;

— deletion of the PN 16 loose plate flange series.

Pipework — Fittings for corrugated metal hoses

1 Scope

This International Standard specifies the characteristics of fittings for corrugated metal hose conforming with the requirements of ISO 10380.

This International Standard is also valid for other fittings provided they meet the material, design, assembly and test requirements specified herein.

2 Normative references

The following referenced documents are indispensable for the application 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 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1 : Dimensions, tolerances and designation*

ISO 724, *ISO general-purpose metric screw threads — Basic dimensions*

ISO 4144, *Pipework — Stainless steel fittings threaded in accordance with ISO 7-1*

ISO 4145, *Non alloy steel fittings threaded to ISO 7-1*

ISO 4200:1991, *Plain end steel tubes, welded and seamless — General tables of dimensions and masses per unit length*

ISO 6761, *Steel tubes — Preparation of ends of tubes and fittings for welding*

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

ISO 7268, *Pipe components — Definition of nominal pressure*

ISO 7369, *Pipework — Metal hoses and hose assemblies — Vocabulary*

ISO 10380:2003, *Pipework — Corrugated metal hoses and hose assemblies*

EN 1092-1:2001, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges*

EN 1333, *Pipework components — Definition and selection of PN*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7369 apply.

4 Information to be supplied by the purchaser

4.1 The purchaser shall state the following in enquiries and orders:

a) intended application;

b) nominal size;

c) maximum operating pressure;

d) materials of construction;

e) temperature range;

f) type of fitting

   1) as specified in Table 1, or

   2) as specified by the purchaser.

4.2 Depending on the application, the purchaser shall provide

a) product to be conveyed;

b) any special information concerning choice of materials;

c) requirements for test certificates;

d) any special requirements for packaging.

5 Requirements

5.1 Classification

Fittings are classified as follows:

a) welded screwed,

b) welded stub,

c) welded flanged,

d) adaptors, and

e) those specified in Table 1.

5.2 Materials

Materials for the parts of end fittings that are welded or brazed shall be selected from those listed in ISO 10380:2003, Table 1. The use of materials other than these shall be subjected to agreement between the manufacturer and the user.

Materials for other parts of the fittings shall be selected from ISO standardized materials and on the basis of their suitability for the conditions under which the hose assemblies will be used.

5.3 Dimensions

Fitting dimensions shall be as given in Tables 3 to 13.

5.4 Design

5.4.1 Pressure

Welded screwed, welded stub and adaptor fittings shall be specified to be in accordance with the pressures given in ISO 10380:2003, 5.3.1.1.

Pressures for welded flanged fittings shall be as specified in Tables 11 to 15. These pressures are in accordance with ISO 7268 and EN 1333.

Where assemblies consist of fittings with different allowable or nominal pressures, the lower value shall be used for the assembly.

5.4.2 Temperature

For temperatures below –20 °C or exceeding 50 °C, reference shall be made to the derating factors in ISO 10380:2003, Table 3.

5.5 Method of assembly

The fittings shall be joined to the hose as specified in ISO 10380:2003, 5.8.

6 Type tests

6.1 General

All types of welded fitting listed in Table 1 shall be permanently joined to a tube or corrugated metal hose according to the method specified in ISO 10380. They are then assembled as a test assembly, as shown in Table 2.

The test medium shall be water unless otherwise agreed by the purchaser.

6.2 Leakage test

Subject a test assembly to an hydraulic pressure of 1,5 times the maximum allowable pressure for a minimum of 1 min. The sealing faces of the fittings shall show no signs of visible leakage.

6.3 Burst test

Subject a test assembly to an hydraulic pressure applied gradually in increments over a minimum period of 1 min until the assembly fails by leakage or rupture of any of the components, and note the pressure. The burst pressure of the fitting test assembly shall not be less than four times the maximum allowable pressure.

7 Designation

The fittings specified in this International Standard shall be designated, in the order indicated, by the following information:

a) reference to this International Standard, i.e. ISO 10806;

b) symbol (see Table 1);

c) nominal size DN (see Tables 3 to 15);

d) maximum allowable, nominal pressure (for flanges), PN;

e) grade of material (S for non-alloyed steel or in conformity with ISO 10380 for stainless steel);

f) for loose flange, the grade of material of the flanged connection piece shall be indicated after that of the flange material.

EXAMPLE 1 A male fitting with a nominal size DN 50 designed for a pressure of 16 bar and of non-alloyed steel shall be designated as follows:

ISO 10806 - M - DN 50 - PN 16 - S

EXAMPLE 2 A loose flange with a nominal size DN 50 and a pressure of PN 16, having a weld-on plate collar of stainless steel grade type X 2 CrNi 18 10 and a non-alloyed steel flange, shall be designated as follows:

ISO 10806 - LF/02 - DN 50 - PN 16 - S - X 2 CrNi 18 10

Table 1 — Types of fittings, their symbols and dimensions

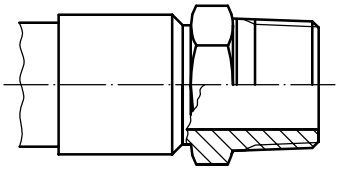
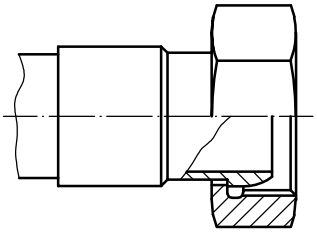
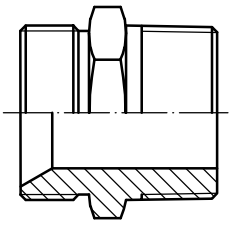
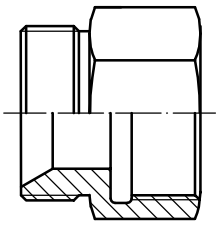
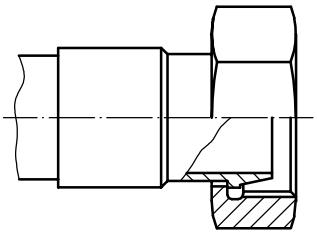
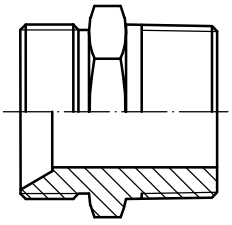
Diagram	Type	Symbol	Dimensions	
			Figure	Table
	Fixed male	M	1	3
	Fixed spherical nipple with swivel nut	FS	2	4
	Male adaptor for spherical nipple	MMS	3	5
	Female adaptor for spherical nipple	MFS	4	6
	Fixed conical nipple with swivel nut[a]	FC	5	7
	Male adaptor for conical nipple[a]	MMC	6	8

Table 1 (*continued*)

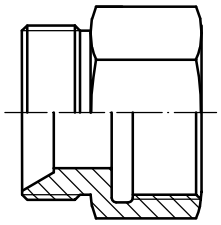
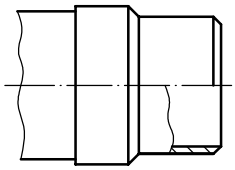
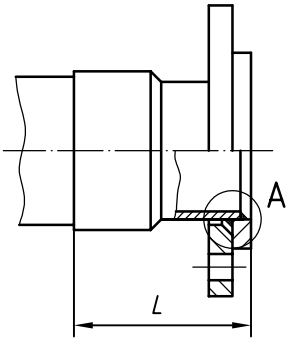
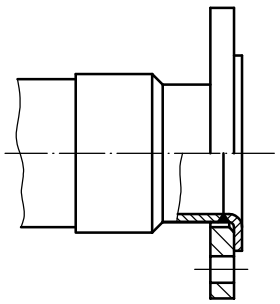
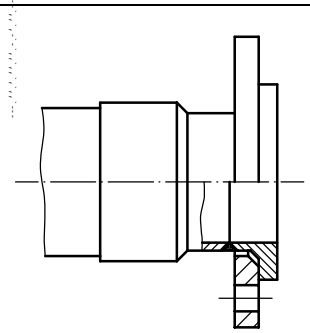
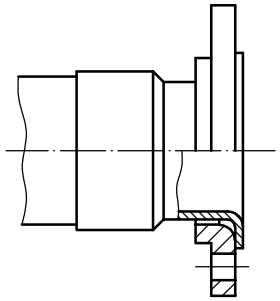
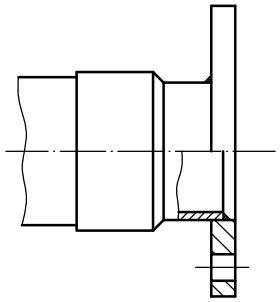
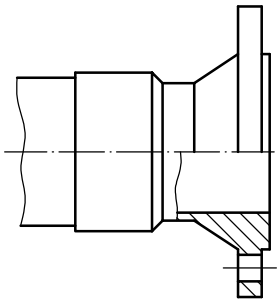
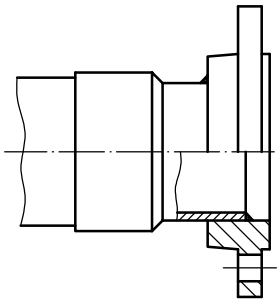
Diagram	Type	Symbol	Dimensions	
			Figure	Table
	Female adaptor for conical nipple[a]	MFC	7	9
	Tube end	T	8	10
	Loose flange with weld-on plate collar PN 6; PN 10; PN 16; PN 25; PN 40 (DIN series)	LF/02	9	11
	Loose flange with lapped tube end PN 6; PN 10; PN 16; PN 25; PN 40 (DIN series)	LF/03		
	Loose flange with welding neck collar PN 10; PN 16; PN 25; PN 40 (DIN series)	LF/04		

Table 1 (*continued*)

Diagram	Type	Symbol	Dimensions	
			Figure	Table
	Loose hubbed flange for lapped pipe end PN 20; PN 50; PN 110; PN 150; PN 260 (ANSI series)	LF/15	10	12
	Fixed plate flange for welding PN 6; PN 10; PN 16; PN 25; PN 40; PN 63; PN 100 (DIN series) PN 20 (ANSI series)	FF/01	11	13
	Fixed welding neck flange PN 6; PN 10; PN 16; PN 25; PN 40; PN 63; PN 100 (DIN series) PN 20; PN 50; PN 110; PN 150; PN 260 (ANSI series)	FF/11	12	14
	Fixed hubbed slip-on flange for welding PN 6; PN 10; PN 16; PN 25; PN 40; PN 63; PN 100 (DIN series) PN 20; PN 50; PN 110; PN 150; PN 260 (ANSI series)	FF/12	13	15

[a] The combination of Figure 5, Table 7 fittings with those of Figure 6, Table 8 or those of Figure 7, Table 9 should only be supplied and used as complete assemblies, because these fittings are not necessarily interchangeable.

Table 2 — Type test fittings

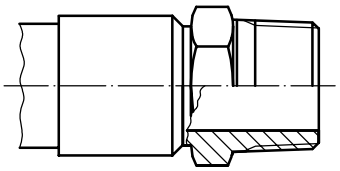
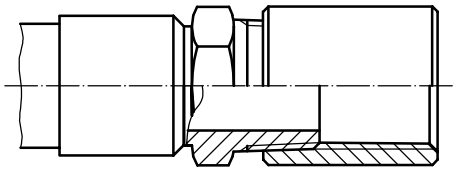
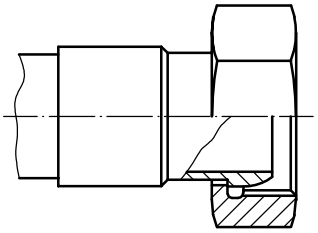
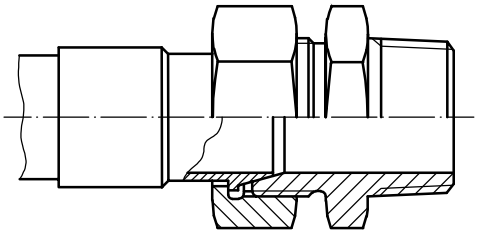
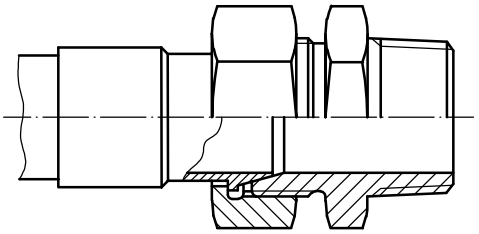
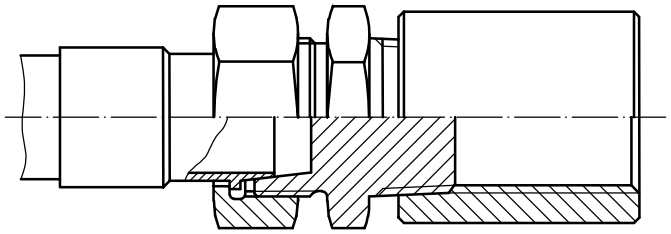
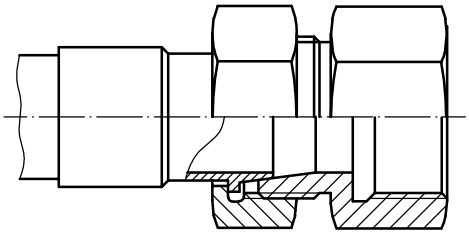
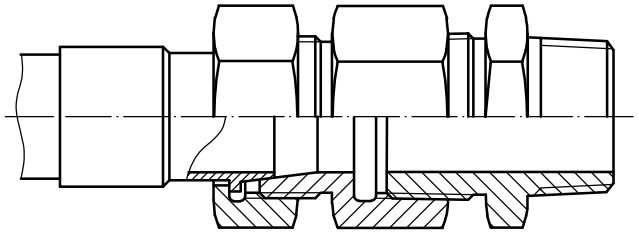
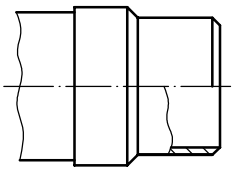
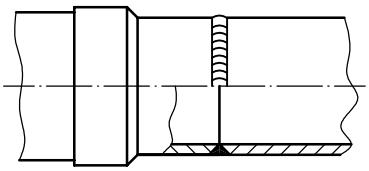
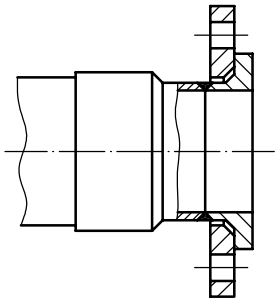
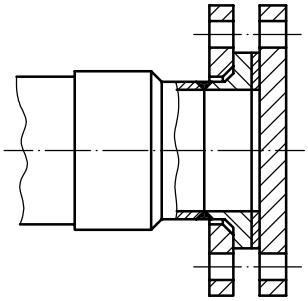
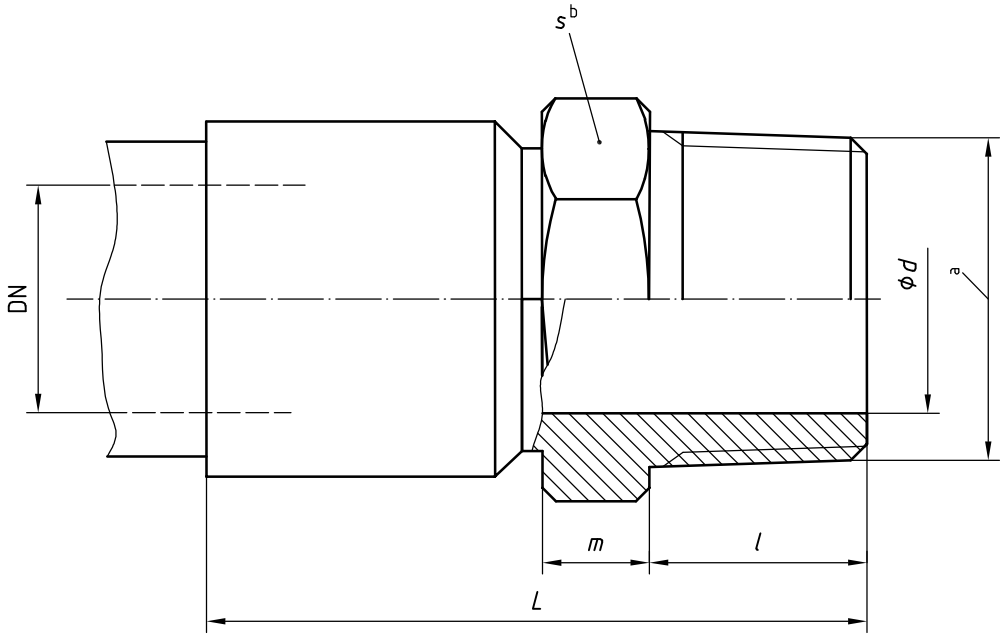
Fitting assembled	Test assembly
M 	Female fitting in accordance with ISO 4144 or ISO 4145 
FS or FC 	Fitting MMS or MFS – MMC or MFC 
MMS with FS or MMC with FC 	Female fitting in accordance with ISO 4144 or ISO 4145 
MFS with FS or MFC with FC 	Male fitting in accordance with ISO 4144 or ISO 4145 

Table 2 (*continued*)

Fitting assembled	Test assembly
T 	Butt welded tube with equal dimensions 
See Figures 9 to 13 	Loose or swivel flange with equal dimensions 



a External tapered thread in accordance with ISO 7-1.

b Width across flats (hexagonal flats up to DN 50, hexagonal or octagonal from DN 65 to DN 100).

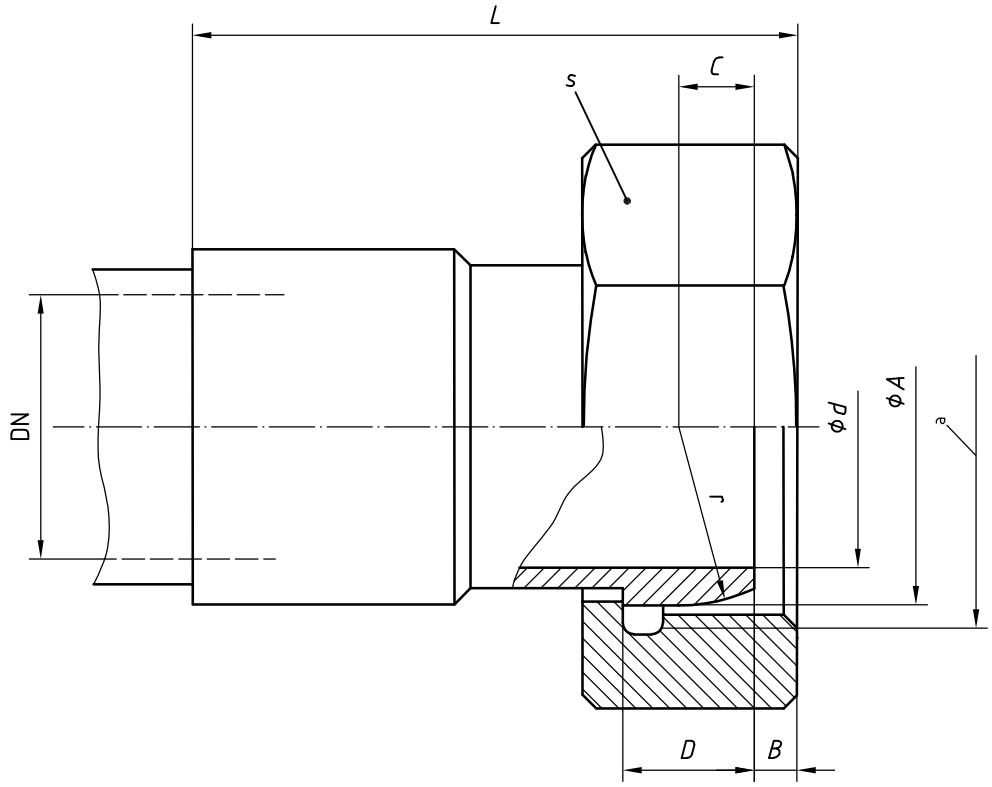
Figure 1 — Fixed male fitting (M)

Table 3 — Dimensions of fixed male fittings (M)

Dimensions in millimetres

DN	Thread ISO 7-1	d max.	s	m min.	l min.	L max.
6	R 1/8	6	12	4	9	40
8	R 1/4	8	14	4	13	45
10	R 3/8	10	17[a]	5	13	50
12	R 1/2	12	22	5	17	55
15	R 1/2	15	22	5	17,5	60
20	R 3/4	20	27	5,5	18,5	65
25	R 1	25	36	6	21,5	75
32	R 1 1/4	32	46	6,5	23,5	85
40	R 1 1/2	40	50	6,5	24,5	95
50	R 2	50	65	7	29	100
65	R 2 1/2	65	80	7	35	105
80	R 3	80	90	8,5	39	110
100	R 4	100	115	8	48	120

[a] Width across flats value of 19 may be used.



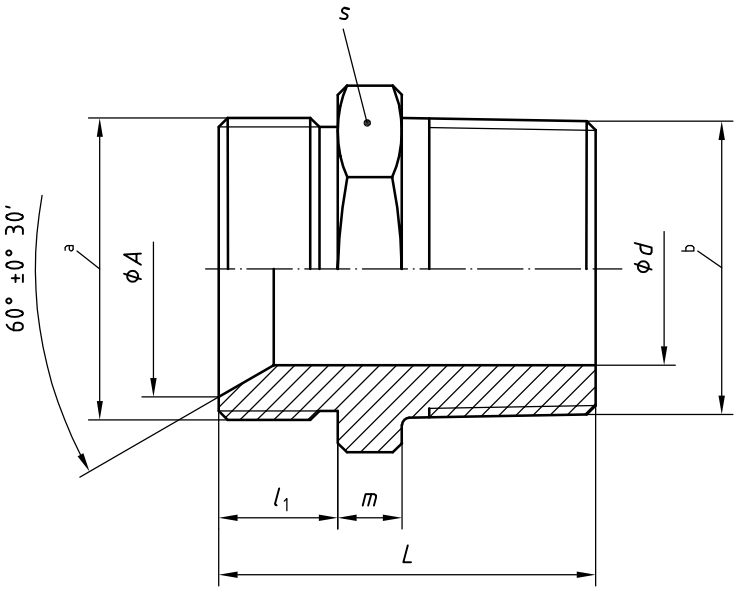
a Internal cylindrical thread in accordance with ISO 228-1.

Figure 2 — Fixed spherical nipple with swivel nut (FS)

Table 4 — Dimensions of fixed spherical nipples with swivel nuts (FS)

Dimensions in millimetres

DN	Thread ISO 228-1	*A*	*B*	*d* max.	*C*	*D*	*r*	*s*	*L* max.
6	G 1/8	8,4	3	4	3	4	4,2	14	45
8	G 1/4	11,2	4,2	7	3,5	3,8	5,6	19	50
10	G 3/8	14,8	6	9	5	5	7,4	22	50
12	G 1/2	18,4	6,5	12	6	6	9,2	27	60
15/1	G 1/2	18,4	6,5	14	6	6	9,2	27	60
15/2	G 3/4	23,8	8,7	15	7,3	7,8	11,9	32	65
20	G 3/4	23,8	8,7	17	7,3	7,8	11,9	32	65
25	G 1	30	10,5	22	9	9	15	41	75
32	G 1 1/4	38,8	10,1	29	11,4	11,4	19,4	50	80
40	G 1 1/2	44,4	12,2	34	13,4	13,8	22,2	55	95
50	G 2	56,4	16,1	44	16,4	16,9	28,2	70	105



a External cylindrical thread in accordance with ISO 228-1.

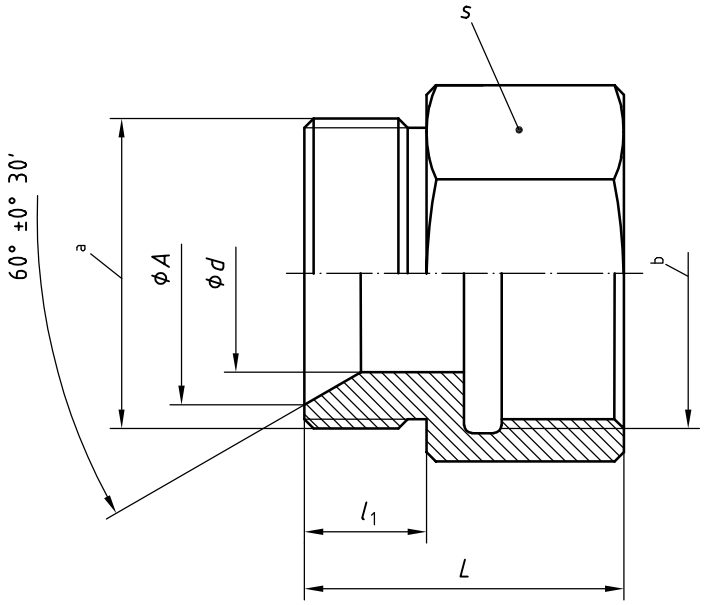
b External tapered thread in accordance with ISO 7-1.

Figure 3 — Male adaptor for spherical nipple (MMS)

Table 5 — Dimensions of male adaptors for spherical nipples (MMS)

Dimensions in millimetres

DN	Thread ISO 228-1	Thread ISO 7-1	A	d max.	l_1	m min.	L min.	s
6	G 1/8B	R 1/8	7,8	5	8	4	20,5	12
8	G 1/4B	R 1/4	10,4	7	10	4	26,5	14
10	G 3/8B	R 3/8	13,9	9	12	5	30	17
12	G 1/2B	R 1/2	17,5	12	14	5	36	22
15/1	G 1/2B	R 1/2	17,5	12	14	5	36	22
15/2	G 3/4B	R 3/4	22,8	18	16	5,5	40	27
20	G 3/4B	R 3/4	22,8	18	16	5,5	40	27
25	G 1B	R 1	28,7	23	18	6	45,5	36
32	G 1 1/4B	R 1 1/4	36,8	30	20	6,5	50,5	46
40	G 1 1/2B	R 1 1/2	42,7	35	22	6,5	52,5	50
50	G 2B	R 2	54,6	45	27	7	63,5	65



a External cylindrical thread in accordance with ISO 228-1.

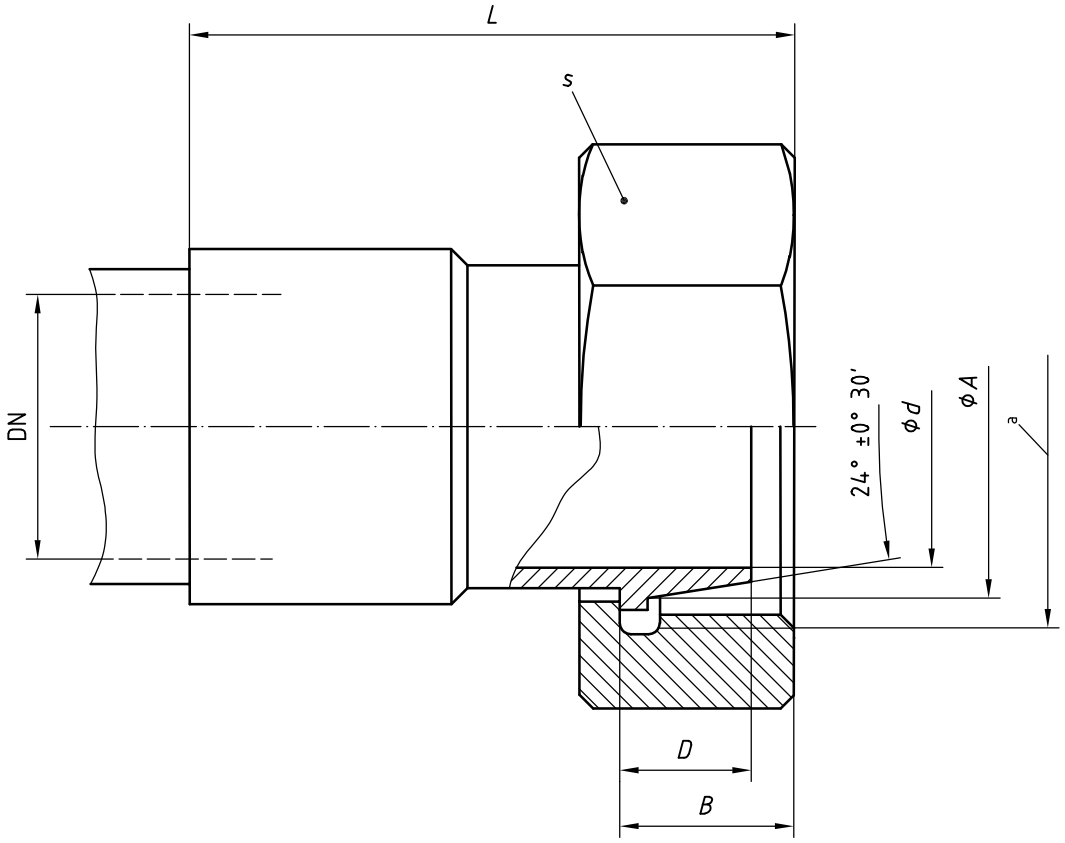
b Internal cylindrical thread in accordance with ISO 7-1.

Figure 4 — Female adaptor for spherical nipple (MFS)

Table 6 — Dimensions of female adaptors for spherical nipples (MFS)

Dimensions in millimetres

DN	Thread ISO 228-1	Thread ISO 7-1	A	d max.	L	l_1	s
6	G 1/8B	Rp 1/8	7,8	5	20	8	14
8	G 1/4B	Rp 1/4	10,4	7	26	10	19
10	G 3/8B	Rp 3/8	13,9	9	29,5	12	22
12	G 1/2B	Rp 1/2	17,5	12	35,5	14	27
15/1	G 1/2B	Rp 1/2	17,5	12	35,5	14	27
15/2	G 3/4B	Rp 3/4	22,8	18	40,5	16	32
20	G 3/4B	Rp 3/4	22,8	18	40,5	16	32
25	G 1B	Rp 1	28,7	23	45,5	18	41
32	G 1 1/4B	Rp 1 1/4	36,8	30	49	20	50
40	G 1 1/2B	Rp 1 1/2	42,7	35	51,5	22	55
50	G 2B	Rp 2	54,6	45	61	27	70



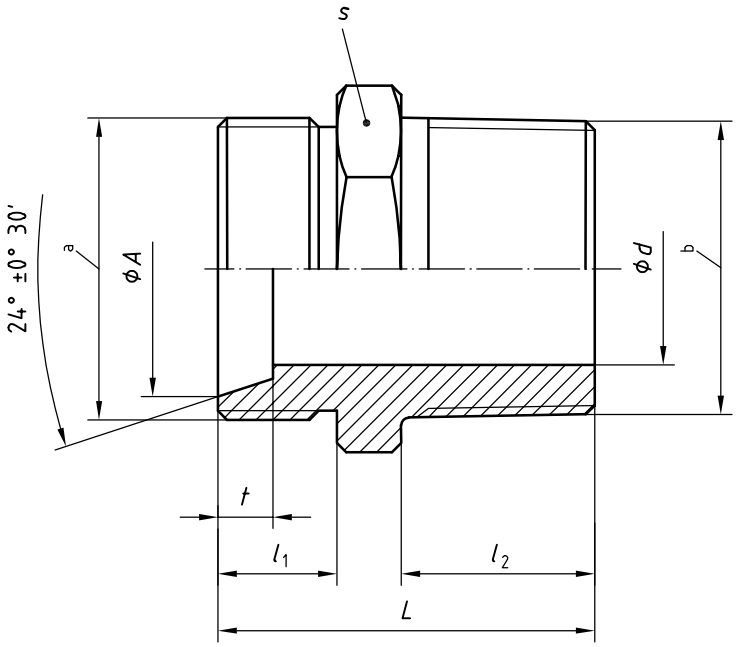
[a] Internal cylindrical thread in accordance with ISO 724.

Figure 5 — Fixed conical nipple with swivel nut (FC)

Table 7 — Dimensions of fixed conical nipples with swivel nuts (FC)

Dimensions in millimetres

DN	Thread ISO 724	*A*	*d* max.	*s*	*B*	*D*	*L* max.
6	M14 × 1,5	11,1	6	17	8,5	7	45
8	M16 × 1,5	13,3	8	19	9,5	7	50
10	M18 × 1,5	15,3	9	22	9,5	7	50
12	M22 × 1,5	18,3	12	27	10	7	60
15	M26 × 1,5	21,3	15	32	10,5	7,5	60
20	M30 × 2	25,3	19	36	12	7,5	65
25	M36 × 2	31,3	24	41	12,5	7,5	75
32	M45 × 2	39	32	50	14	10,5	80
40	M52 × 2	46	39	60	14	11	95
50	M64 × 2	58	50	70	17	12	105



a External cylindrical thread in accordance with ISO 724.

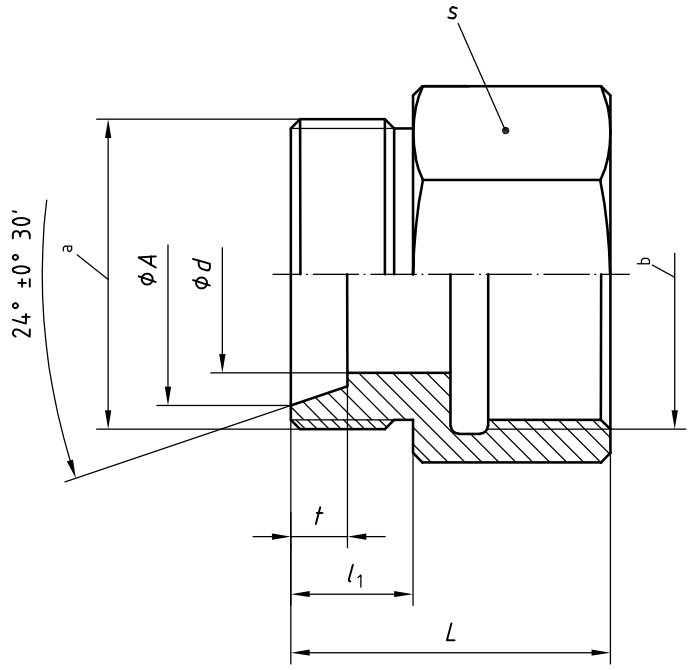
b External tapered thread in accordance with ISO 7-1.

Figure 6 — Male adaptor for conical nipple (MMC)

Table 8 — Dimensions of male adaptors for conical nipples (MMC)

Dimensions in millimetres

DN	Thread ISO 724	Thread ISO 7-1	A	d max.	l_1	l_2 min.	t min.	L min.	s
6	M14 × 1,5	R 1/8	10,1	5	10	9	7	24	14
8	M16 × 1,5	R 1/4	12,3	8	11	13	7	29	17
10	M18 × 1,5	R 3/8	14,3	9	11	13	7	29	19
12	M22 × 1,5	R 1/2	17,3	12	12	17	7	34	24
15	M26 × 1,5	R 1/2	20,3	15	12	17,5	7,5	35	27
20	M30 × 2	R 3/4	24,3	19	14	18,5	7,5	38	32
25	M36 × 2	R 1	30,3	25	14	21,5	7,5	41	41
32	M45 × 2	R 1 1/4	38	32	16	23,5	10,5	46	46
40	M52 × 2	R 1 1/2	45	39	16	24,5	11	47	55
50	M64 × 2	R 2	57	50	18	29	12	54	65



a External cylindrical thread in accordance with ISO 724.

b Internal cylindrical thread in accordance with ISO 7-1.

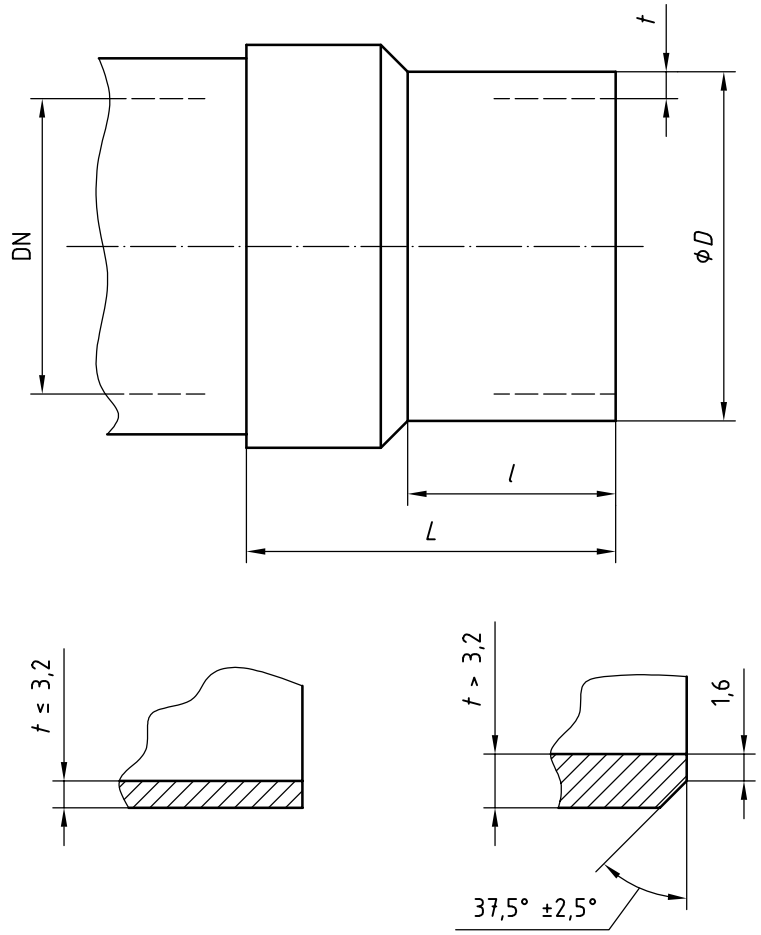
Figure 7 — Female adaptor for conical nipple (MFC)

Table 9 — Dimensions of female adaptors for conical nipples (MFC)

Dimensions in millimetres

DN	Thread ISO 724	Thread ISO 7-1	A	d max.	L	l_1	t	s
6	M14 × 1,5	Rp 1/8	10,1	6	24	10	7	17
8	M16 × 1,5	Rp 1/4	12,3	8	25	11	7	19
10	M18 × 1,5	Rp 3/8	14,3	9	26	11	7	22
12	M22 × 1,5	Rp 1/2	17,3	12	30	12	7	27
15	M26 × 1,5	Rp 1/2	20,3	15	30	12	7,5	27
20	M30 × 2	Rp 3/4	24,3	19	34	14	7,5	32
25	M36 × 2	Rp 1	30,3	25	37	14	7,5	41
32	M45 × 2	Rp 1 1/4	38	32	42	16	10,5	46
40	M52 × 2	Rp 1 1/2	45	39	44	16	11	55
50	M64 × 2	Rp 2	57	50	50	18	12	65

Dimensions in millimetres



Preparation for welding as specified in ISO 6761.

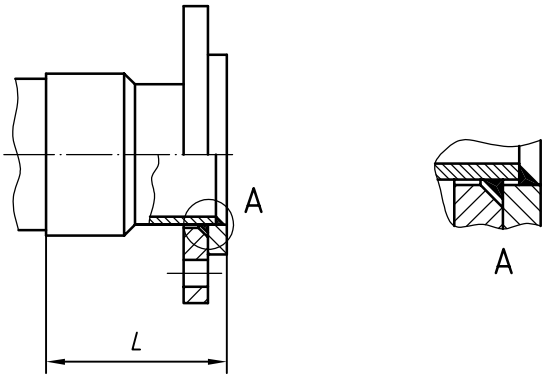
Figure 8 — Tube end (T)

Table 10 — Dimensions of tube ends (T)

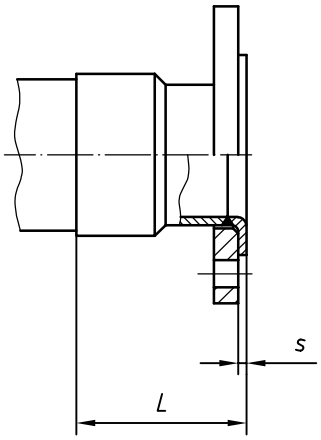
Dimensions in millimetres

DN	D	t^a min.	l min.	L max.
6	10,2	1,6	25	60
8	13,5	2	25	60
10	17,2	2	25	70
15	21,3	2	25	70
20	26,9	2	30	70
25	33,7	2,3	30	70
32	42,4	2,6	30	75
40	48,3	2,6	30	75
50	60,3	2,9	40	90
65	76,1	2,9	40	95
80	88,9	3,2	40	100
100	114,3	3,6	50	105
125	139,7	4	50	120
150	168,3	4,5	70	130
200	219,1	6,3	70	140
250	273	6,3	70	145
300	323,9	7,1	70	150

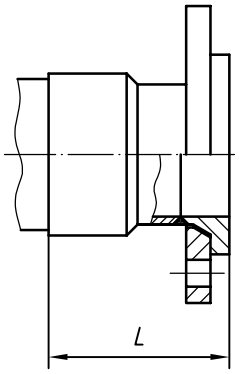
[a] Thickness in accordance with ISO 4200:1991, series E, to be used up to a design pressure of 16 bar; for higher pressures refer to ISO 7005-1:1992 or EN 1092-1 .



Type LF/02



Type LF/03



Type LF/04

Figure 9 — Loose flange with weld-on plate collar (LF/02), with lapped tube end (LF/03) and with welding neck collar (LF/04) (DIN series)

Table 11 — Dimensions of loose flanges LF/02, LF/03 and LF/04 (DIN series, see Figure 9)

Dimensions in millimetres

DN	PN 6		PN 10		PN 16		PN 25		PN 40	
	a b		c		d		e		f	
	s min.	*L* max.	*s* min.	*L* max.	*s* min.	*L* max.	*s* min.	*L* max.	*s* min.	*L* max.
10	Use PN 10		3	75	Use PN 40		Use PN 40		3	85
15			3	80					3	90
20			3	80					3	100
25			3	90					3	110
32			3,5	90					3,5	110
40			3,5	100					3,5	115
50			3,5	105					3,5	120
65			3,5	110					3,5	130
80			4	115					4	135
100			4	120					4	140
125			4	140					4	160
150			4,5	155					4,5	175
200			6,3	165					6,3	185
250			6,3	180					7,1	200
300			7,1	185					8	205

a For flange dimensions, see ISO 7005-1:1992, Table 9 or EN 1092-1:2001, Table 7.

b Only for loose flange type LF/02 and LF/03.

c For flange dimensions, see ISO 7005-1:1992, Table 10 or EN 1092-1:2001, Table 8.

d For flange dimensions, see ISO 7005-1:1992, Table 11 or EN 1092-1:2001, Table 9.

e For flange dimensions, see ISO 7005-1:1992, Table 13 or EN 1092-1:2001, Table 10.

f For flange dimensions, see ISO 7005-1:1992, Table 14 or EN 1092-1:2001, Table 11.

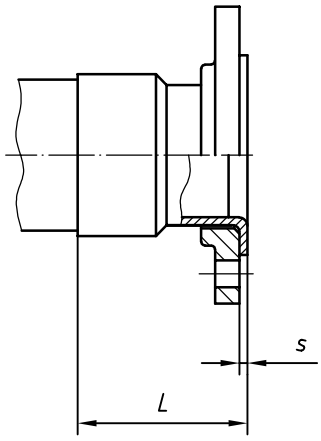


Figure 10 — Loose hubbed flange for lapped pipe end (LF/15) (ANSI series)

Table 12 — Dimensions of loose hubbed flanges for lapped pipe ends (LF/15) (ANSI series)

Dimensions in millimetres

DN	PN 20		PN 50		PN 110		PN 150		PN 260	
	a		b		c		d		e	
	s min.	*L* max.	*s* min.	*L* max.	*s* min.	*L* max.	*s* min.	*L* max.	*s* min.	*L* max.
15	2,77	85	2,77	90	f	95	Use PN 260		f	100
20	2,87	90	2,87	100	f	105			f	110
25	3,38	100	3,38	110	f	115			f	120
32	3,56	105	3,56	110	f	115				
40	3,68	110	3,68	115	f	120				
50	3,91	115	3,91	120	f	125				
65	5,16	120	5,16	130						
80	5,49	125	5,49	135						
100	6,02	130	6,02	140						
125	6,55	150	6,55	160						
150	7,11	160	7,11	165						
200	8,18	170	8,18	185						
250	9,27	180	9,27	200						
300	f	190	f	205						

a For flange dimensions, see ISO 7005-1:1992, Table 12.

b For flange dimensions, see ISO 7005-1:1992, Table 15.

c For flange dimensions, see ISO 7005-1:1992, Table 16.

d For flange dimensions, see ISO 7005-1:1992, Table 17.

e For flange dimensions, see ISO 7005-1:1992, Table 18.

f The lapped pipe thickness is subject to agreement between the manufacturer and purchaser.

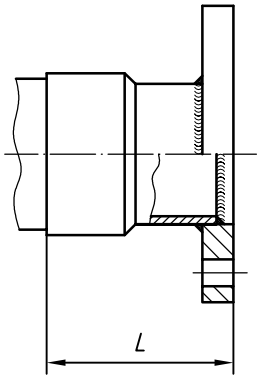


Figure 11 — Fixed plate flange for welding (FF/01)

Table 13 — Dimensions of fixed plate flanges for welding (FF/01)

Dimensions in millimetres

DN	DIN series							ANSI series
	PN 6	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100	PN 20
	a *L* max.	b *L* max.	c *L* max.	d *L* max.	e *L* max.	f *L* max.	g *L* max.	h *L* max.
10	Use PN 40	Use PN 40	Use PN 40	Use PN 40	80	Use PN 100	80	—
15					85		85	85
20					85		90	85
25					85		90	85
32					90		95	85
40					90		100	90
50					90		100	95
65	90	Use PN 16	100		105		110	105
80	105		105		110		115	110
100	105		110		110		115	110
125	115		120		120		130	120
150	135		140		140		150	145
200	140	140	150		155		165	145
250	160	160	160		170		185	170
300	160	160	170		175		200	170

a For flange dimensions, see ISO 7005-1:1992, Table 9 or EN 1092-1:2001, Table 7.

b For flange dimensions, see ISO 7005-1:1992, Table 10 or EN 1092-1:2001, Table 8.

c For flange dimensions, see ISO 7005-1:1992, Table 11 or EN 1092-1:2001, Table 9.

d For flange dimensions, see ISO 7005-1:1992, Table 13 or EN 1092-1:2001, Table 10.

e For flange dimensions, see ISO 7005-1:1992, Table 14 or EN 1092-1:2001, Table 11.

f For flange dimensions, see EN 1092-1:2001, Table 12.

g For flange dimensions, see EN 1092-1:2001, Table 13.

h For flange dimensions, see ISO 7005-1:1992, Table 12.

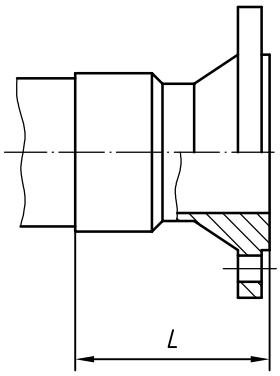


Figure 12 — Fixed welding neck flange (FF/11)

Table 14 — Dimensions of fixed welding neck flanges (FF/11)

Dimensions in millimetres

DN	DIN series							ANSI series				
	PN 6	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100	PN 20	PN 50	PN 110	PN 150	PN 260
	a	b	c	d	e	f	g	h	i	j	k	l
	L max.	*L* max.	*L* max.	*L* max.	*L* max.	*L* max.	*L* max.	*L* max.	*L* max.	*L* max.	*L* max.	*L* max.
10	55	Use PN 40	Use PN 40	Use PN 40	60	Use PN 100	65	—	—	—	Use PN 260	—
15	60				65		70	75	80	80		85
20	65				70			80	85	85		95
25	65				75		85	85	90	90		100
32	70				80		90	90	95	100		105
40	75				80		95	95	100	100		115
50	75				85	95	100	95	100	105		135
65	75	Use PN 16	80		95	100	110	100	110	110		135
80	80		85		100	110	115	105	115	118	140	155
100	85		90		115	115	125	115	120	135	150	160
125	95		110		120	135	150	135	145	160	175	200
150	100		110		125	140	160	135	145	162	185	220
200	105	110	110	125	135	155	175	150	155	178	210	260
250	115	125	125	140	155	175	210	155	165	205	235	305
300	125	135	135	150	170	200	225	170	185	210	255	340

a For flange dimensions, see ISO 7005-1:1992, Table 9 or EN 1092-1:2001, Table 7.
b For flange dimensions, see ISO 7005-1:1992, Table 10 or EN 1092-1:2001, Table 8.
c For flange dimensions, see ISO 7005-1:1992, Table 11 or EN 1092-1:2001, Table 9.
d For flange dimensions, see ISO 7005-1:1992, Table 13 or EN 1092-1:2001, Table 10.
e For flange dimensions, see ISO 7005-1:1992, Table 14 or EN 1092-1:2001, Table 11.
f For flange dimensions, see EN 1092-1:2001, Table 12.
g For flange dimensions, see EN 1092-1:2001, Table 13.
h For flange dimensions, see ISO 7005-1:1992, Table 12.
i For flange dimensions, see ISO 7005-1:1992, Table 15.
j For flange dimensions, see ISO 7005-1:1992, Table 16.
k For flange dimensions, see ISO 7005-1:1992, Table 17.
l For flange dimensions, see ISO 7005-1:1992, Table 18.

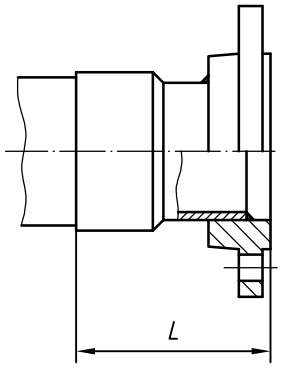


Figure 13 — Fixed hubbed slip-on flange (FF/12)

Table 15 — Dimensions of fixed hubbed slip-on flanges (FF/12)

Dimensions in millimetres

DN	DIN series							ANSI series				
	PN 6	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100	PN 20	PN 50	PN 110	PN 150	PN 260
	a	b	c	d	e	f	g	h	i	j	k	l
	L max.	*L* max.	*L* max.	*L* max.	*L* max.	*L* max.	*L* max.	*L* max.	*L* max.	*L* max.	*L* max.	*L* max.
10	Use PN 40				80	Use PN 100	80	—	—	—	—	—
15					85		85	Use PN 50	85	85	Use PN 260	90
20					85		90		85	90		95
25					85		90		85	90		100
32					90		95		90	95		
40					90		100		90	100		
50					90		100		90	100		
65					105		110		105			
80					110		115		110			
100					110		115		110			
125					120		130		120			
150					140		150		140			
200					155				155			
250					170				170			
300					175				175			

a For flange dimensions, see ISO 7005-1:1992, Table 9 or EN 1092-1:2001, Table 7.
b For flange dimensions, see ISO 7005-1:1992, Table 10 or EN 1092-1:2001, Table 8.
c For flange dimensions, see ISO 7005-1:1992, Table 11 or EN 1092-1:2001, Table 9.
d For flange dimensions, see ISO 7005-1:1992, Table 13 or EN 1092-1:2001, Table 10.
e For flange dimensions, see ISO 7005-1:1992, Table 14 or EN 1092-1:2001, Table 11.
f For flange dimensions, see EN 1092-1:2001, Table 12.
g For flange dimensions, see EN 1092-1:2001, Table 13.
h For flange dimensions, see ISO 7005-1:1992, Table 12.
i For flange dimensions, see ISO 7005-1:1992, Table 15.
j For flange dimensions, see ISO 7005-1:1992, Table 16.
k For flange dimensions, see ISO 7005-1:1992, Table 17.
l For flange dimensions, see ISO 7005-1:1992, Table 18.

ICS 23.040.70

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