



S.R.L.

CATALOG

**de flanse si fittinguri pentru instalatii
de tubulatura din otel si otel-inox**



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CATALOG TEHNIC

Flanse si fittinguri pentru instalatii de tubulatura

Prezenta lucrare este un ghid pentru clientii nostri.

Consultand acest catalog puteti sa va alegeti mai usor produsele care va sunt necesare, avand informatii tehnice despre cele mai uzuale repere utilizate in instalatiile industriale de tubulatura, pe care noi le furnizam.

Colectivul RORY SRL

TECHNICAL CATALOG

Flanges and Fittings for Tubing Installation

This book is a guide for our clients.

This catalog will help you choose the products that you need, by providing the technical information about the most commonly used pieces in industrial pipe installation, that we provide.

RORY LTD team

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A. FLANSE
FLANGES

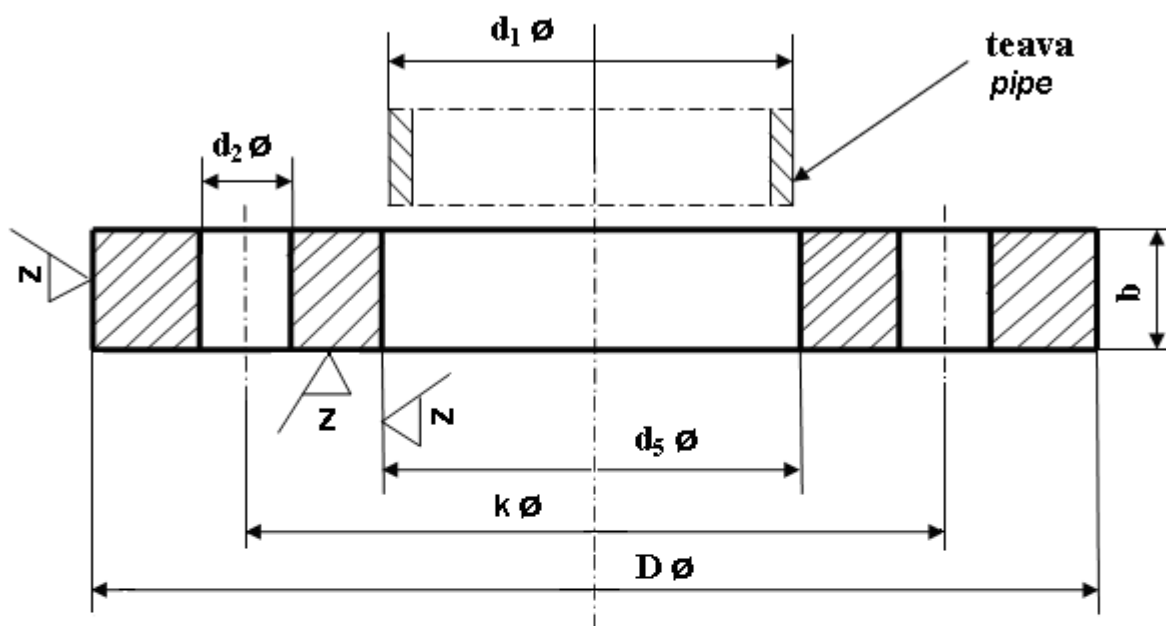
1. FLANSE CONFORM STANDARDELOR GERMANE (DIN) FLANGES ACCORDING TO GERMAN STANDARDS (DIN)

1.1. Flanse plate conform standardelor germane (DIN) Flat Flanges According to German Standards (DIN)

Forma A : suprafata de imbinare fara cerinte speciale
Shape A : joint face without requirement

Forma B : suprafata de imbinare cu rugozitate $Rz = 160$ ($\sqrt{Z} = \sqrt{Rz = 160}$)

Shape B : joint face with $Rz = 160$ ($\sqrt{Z} = \sqrt{Rz = 160}$)

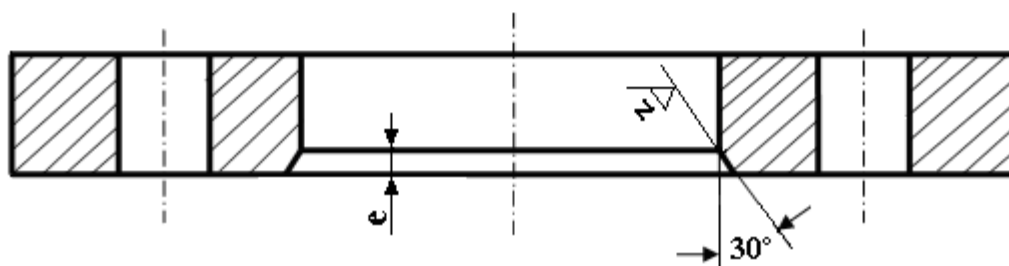


Pentru constructii navale
For ships building

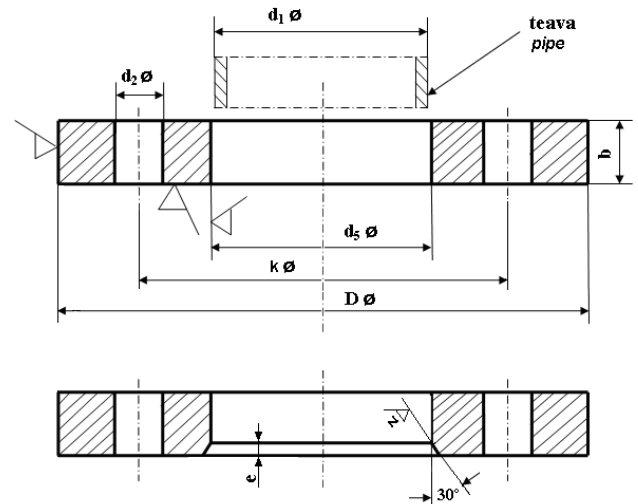
Forma AS : suprafata de imbinare fara cerinte speciale
Shape AS : joint face without requirement

Forma BS : suprafata de imbinare cu rugozitate $Rz = 160$ ($\sqrt{Z} = \sqrt{Rz = 160}$)

Shape BS : joint face with $Rz = 160$ ($\sqrt{Z} = \sqrt{Rz = 160}$)



1.1.1. Flanse pate conform DIN 2573 PN 6 Flat Flanges According to DIN 2573 NP 6



tabel A 1.1.1. table A 1.1.1.

Teava Pipe		Dimensiunile flansei Flange Dimensions					Suruburi Screws			Masa (Kg) Weight (Kg)	Material/Calitate Material/Grades		
DN mm	d1 mm	d5 mm	D mm	b mm	k mm	e mm	buc n	filet thread	d2 mm	(7.85Kg/dm3)	Otel Carbon Steel	Otel Inox Stainless Steel	
ND mm											St 37-2 (S235-J2)	4301/4306 (304/304L)	4401/4404 (316/316L)
10	14 17.2	14.5 17.7	75	12	50	5	4	M10	11	0.363	x	x	x
15	20 21.3	21 22	80	12	55	5	4	M10	11	0.41	x	x	x
20	25 26.9	26 27.6	90	14	65	5	4	M10	11	0.60	x	x	x
25	30 33.7	31 34.4	100	14	75	5	4	M10	11	0.74	x	x	x
32	38 42.4	39 43.1	120	16	90	5	4	M12	14	1.19	x	x	x
40	44.5 48.3	45.5 49	130	16	100	5	4	M12	14	1.39	x	x	x
50	57 60.3	58.1 61.1	140	16	110	6	4	M12	14	1.53	x	x	x
65	76.1	77.1	160	16	130	6	4	M12	14	1.89	x	x	x
80	88.9	90.3	190	18	150	7	4	M16	18	2.98	x	x	x
100	108 114.3	109.6 115.9	210	18	170	7	4	M16	18	3.46	x	x	x
125	133 139.7	134.8 141.6	240	20	200	7	8	M16	18	4.60	x	x	x
150	159 168.3	161.1 170.5	265	20	225	7	8	M16	18	5.22	x	x	x
200	219.1	221.8	320	22	280	7	8	M16	18	7.15	x	o	o
250	267 273	270.2 276.2	375	24	335	7	12	M16	18	9.61	x	o	o
300	323.9	327.6	440	24	395	7	12	M20	22	12.60	x	o	o
350	355.6 368	359.7 372.2	490	26	445	7	12	M20	22	15.60	x	o	o
400	406.4 419	411 423.7	540	28	495	7	16	M20	22	18.40	x	o	o
(450)	457	462.5	595	30	550	7	16	M20	22	21.40	o	o	o
500	508	513.6	645	30	600	7	20	M20	22	24.60	x	o	o

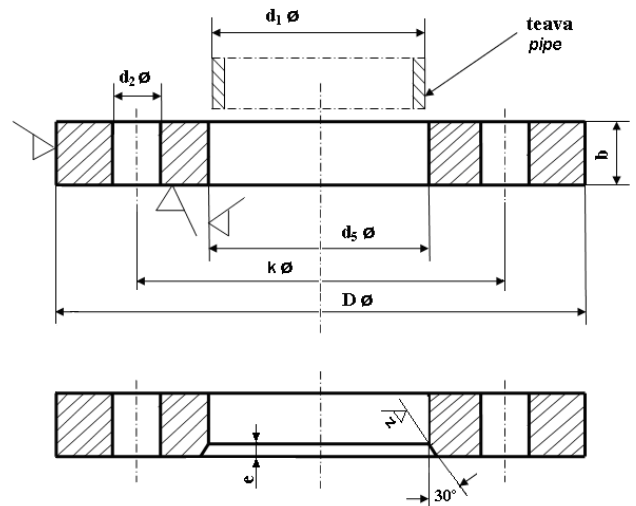
x – Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

x – Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.

o - Se executa numai la comanda

o - Produced only on order.

1.1.2. Flanse plate conform DIN 2576 PN 10 Flat Flanges According to DIN 2576 NP10



tabel A 1.1.2. table A 1.1.2.

Teava Pipe		Dimensiunile flanse Flange Dimensions					Suruburi Screws			Masa (Kg) Weight (Kg)	Material/Calitate Material/Grades		
DN mm	d1 mm	d5 mm	D mm	b mm	k mm	e mm	buc n	filet thread	d2 mm	(7.85Kg/dm3)	Otel Carbon Steel	Otel Inox Stainless Steel	
ND mm											St 37-2 (S235-J2)	4301/4306 (304/304L)	4401/4404 (316/316L)
10	14	14.5	90	14	60	4	4	M12	14	0.613	x	x	x
	17.2	17.7								0.605	x	x	x
15	20	20.5	95	14	65	4	4	M12	14	0.675	x	x	x
	21.3	21.8								0.669	x	x	x
20	25	25.5	105	16	75	5	4	M12	14	0.947	x	x	x
	26.9	27.4								0.936	x	x	x
25	30	30.5	115	16	85	5	4	M12	14	1.14	x	x	x
	33.7	34.2								1.11	x	x	x
32	38	38.5	140	16	100	5	4	M16	18	1.66	x	x	x
	42.4	42.9								1.62	x	x	x
40	44.5	45	150	16	110	5	4	M16	18	1.89	x	x	x
	48.3	48.8								1.86	x	x	x
50	57	57.5	165	18	125	6	4	M16	18	2.51	x	x	x
	60.3	60.8								2.47	x	x	x
65	76.1	76.6	185	18	145	6	4	M16	18	3.00	x	x	x
80	88.9	89.4	200	20	160	7	4	M16	18	3.79	x	x	x
100	108	108.5	220	20	180	7	8	M16	18	4.20	x	x	x
	114.3	114.8								4.03	x	x	x
125	133	135.5	250	22	210	7	8	M16	18	5.71	x	x	x
	139.7	140.2								5.46	x	x	x
150	159	159.5	285	22	240	7	8	M20	23	6.72	x	x	x
	168.3	168.8								6.57	x	x	x
175	191	192	315	24	270	8	8	M20	23	8.60	x	x	x
	193.7	194.7								8.45	x	x	x
200	216	217	340	24	295	8	8	M20	23	9.50	x	o	o
	219.1	220.1								9.31	x	o	o
250	267	268	395	26	350	9	12	M20	23	12.50	x	o	o
	273	274								11.90	x	o	o
300	318	319	445	26	400	9	12	M20	23	14.40	x	o	o
	323.9	324.9								13.80	x	o	o
350	355.6	356.6	505	28	460	9	16	M20	23	20.60	x	o	o
	368	369								19.00	x	o	o
400	406.4	407.4	565	32	515	11	16	M24	27	27.90	x	o	o
	419	420								25.90	x	o	o
500	508	509	670	38	620	13	20	M24	27	41.10	x	o	o
	521	522								37.90	x	o	o

x – Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

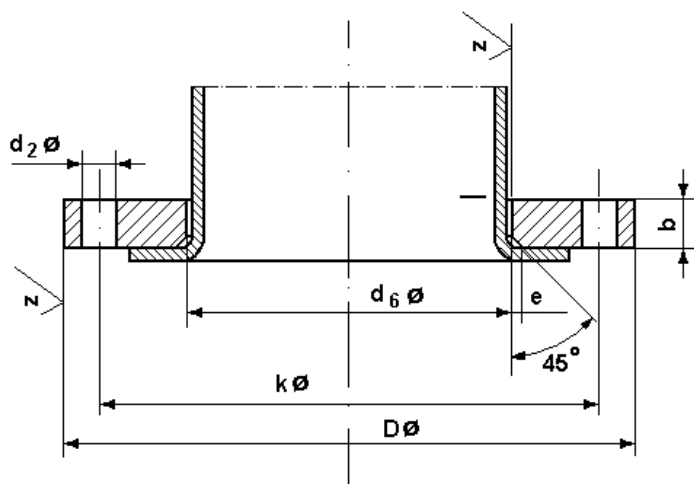
x – Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.

o - Se executa numai la comanda

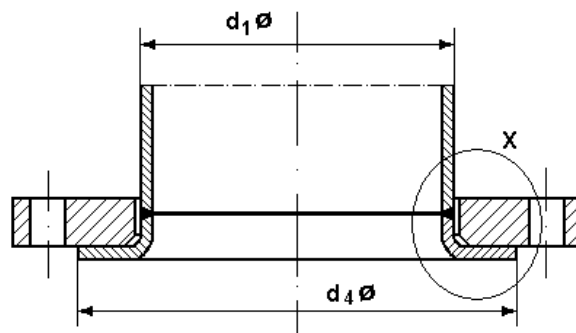
o - Produced only on order.

1.2. Flanse libere conform standardelor germane (DIN) Lapped Flanges According to German Standards (DIN)

F Flansa libera (reprezentata cu teava bordelata)
Lapped Flange

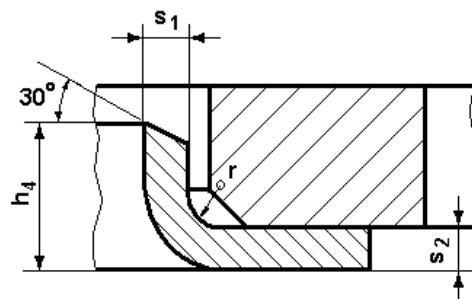
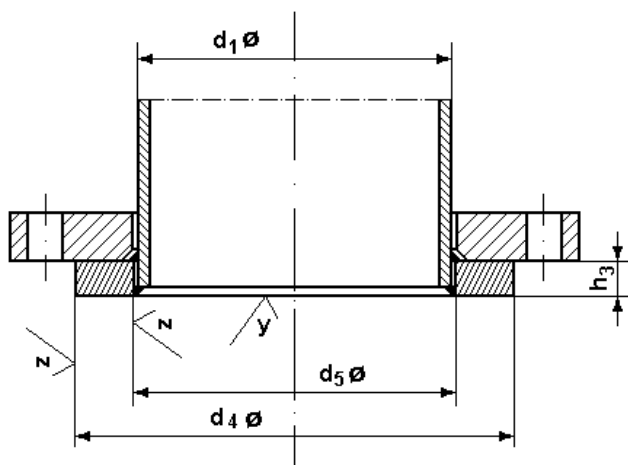


G Flansa libera cu burdel de sudare (cu flansa F)
Lapped Flange With Welding Burdel (with flange F)



Detaliul X (fara teava)
X Detail (without pipe)

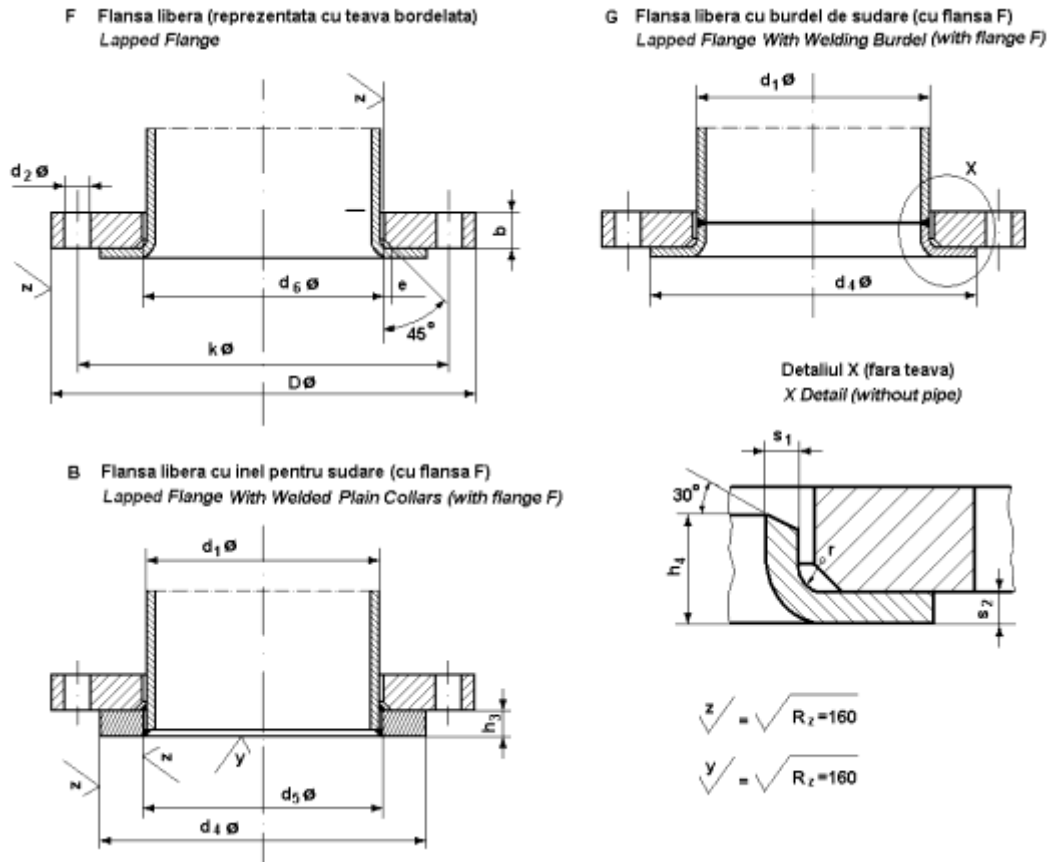
B Flansa libera cu inel pentru sudare (cu flansa F)
Lapped Flange With Welded Plain Collars (with flange F)



$$z = \sqrt{R_z = 160}$$

$$y = \sqrt{R_z = 160}$$

1.2.1. Flanse libere conform DIN 2641 PN 6 Lapped Flanges According to DIN 2641 NP 6



tabel A 1.2.1. table A 1.2.1.

Teava		Dimensiunile flansei in mm					Suruburi			Burdel in mm							Masa (kg) (7.85Kg/dm ³)	
Pipe		Flange Dimensions In mm					Screws			Collar in mm							Weight(kg) (7.85Kg/dm ³)	
DN mm	d1 mm	d6	D	b	k	e	buc n	filet thread	d2 mm	d5	h3	d4 max	h4 min	s1 min	s2 min	r	Flansa Flange	Burdel Collar
10	14	16	75	10	50	2	4	M10	11	14.5	8	35	9	1.8	3	2	0.298	0.051
	17.2	19								17.7								
15	20	22	80	10	55	2	4	M10	11	21	8	40	9	2	3	2	0.337	0.063
	21.3	24								22								
20	25	28	90	10	65	2	4	M10	11	26	10	50	12	2	3	3	0.418	0.116
	26.9	30								27.6								
25	30	33	100	12	75	3	4	M10	11	31	10	60	15	2	3	3	0.62	0.166
	33.7	36								34.4								
32	38	42	120	12	90	3	4	M12	14	39	10	70	15	2.6	3.5	3	0.874	0.213
	42.4	46								43.1								
40	44.5	50	130	12	100	3	4	M12	14	45.5	10	80	17	2.6	3.5	3	1.01	0.273
	48.3	54								49								
50	57	62	140	12	110	3	4	M12	14	58.1	12	90	23	2.6	3.5	3	1.12	0.359
	60.3	65								61.1								
65	76.1	81	160	12	130	3	4	M12	14	77.1	12	110	23	2.6	3.5	3	1.35	0.468
80	88.9	94	190	14	150	3	4	M16	18	90.3	14	128	23	3.2	4	3	2.24	0.73
100	108	113	210	14	170	3	4	M16	18	109.6	14	148	28	3.2	4	3	2.59	0.884
	114.3	119								115.9								

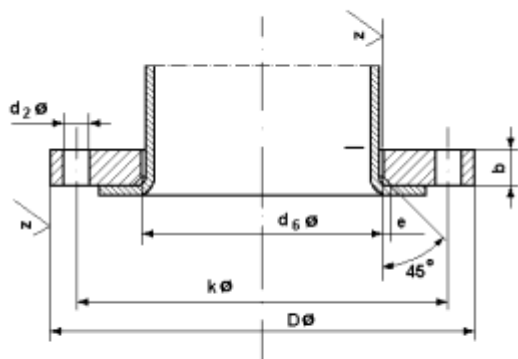
tabel A 1.2.1. (continuare) table A 1.2.1. (continued)

Teava		Dimensiunile flansei in mm					Suruburi			Burdel in mm							Masa (kg) (7.85Kg/dm ³)	
Pipe		Flange Dimensions In mm					Screws			Collar in mm							Weight(kg) (7.85Kg/dm ³)	
DN mm	d1 mm	d6	D	b	k	e	buc	filet	d2 mm	d5	h3	d4 max	h4 min	s1 min	s2 min	r	Flansa	Burdel
ND mm							n	thread									Flange	Collar
125	133	138	240	14	200	3	8	M16	18	134.8	14	178	30	3.2	4	3	3.10	1.21
	139.7	145								141.6								
150	159	164	265	14	225	3	8	M16	18	161.1	14	202	30	3.2	4	3	3.52	1.34
	168.3	173								170.5								
200	219.1	225	320	16	280	3	8	M16	18	221.8	16	258	30	3.2	4	3	4.98	2.00
250	267	273	375	20	335	3	12	M16	18	270.2	18	312	30	4	5	3	7.67	2.89
	273	279								276.2								
300	323.9	329	440	24	395	4	12	M20	22	327.6	18	365	35	4	5	4	12.30	3.56
350	355.6	362	490	26	445	4	12	M20	22	359.7	18	415	-	-	-	4	15.10	4.08
	368	374								372.2								
400	406.4	413	540	28	495	4	16	M20	22	411	20	465	-	-	-	4	17.70	4.91
	419	426								423.7								
(450)	457	467	595	30	550	4	16	M20	22	462.5	20	520	-	-	-	4	20.40	5.70
500	508	517	645	32	600	4	20	M20	22	513.6	22	570	-	-	-	4	25.40	7.39
600	609.6	618	755	36	705	4	20	M24	26	616.6	22	670	-	-	-	4	36.30	8.60
700	711	721	860	40	810	4	24	M24	26	718.6	24	775	-	-	-	4	48.10	14.00
800	813	824	975	44	920	4	24	M27	30	821.5	24	880	-	-	-	4	66.50	16.80
900	914	926	1075	48	1020	4	24	M27	30	923.5	26	980	-	-	-	4	81.30	20.10
1000	1016	1028	1175	52	1120	4	28	M27	30	1027	26	1080	-	-	-	4	96.40	21.50
1200	1220	1232	1405	60	1340	5	32	M30	33	1233	28	1295	-	-	-	5	158.00	32.60

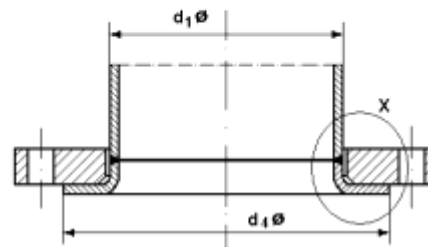
Flansele din otel carbon, din inox sau din aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.

F Flansa libera (reprezentata cu teava bordelata)
Lapped Flange

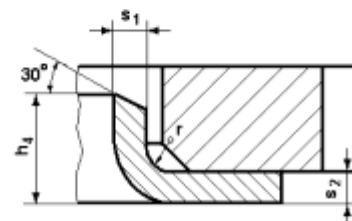
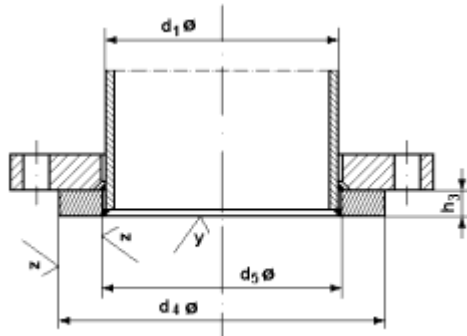


G Flansa libera cu burdel de sudare (cu flansa F)
Lapped Flange With Welding Burdel (with flange F)



Detaliul X (fara teava)
X Detail (without pipe)

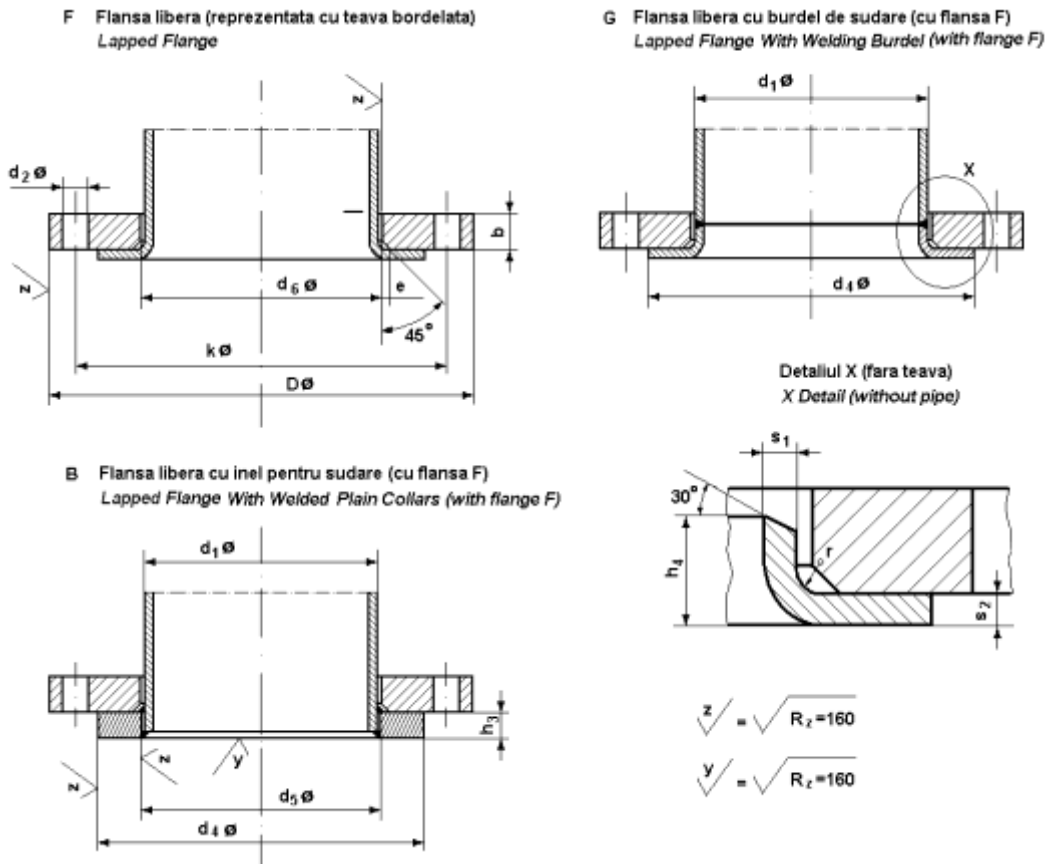
B Flansa libera cu inel pentru sudare (cu flansa F)
Lapped Flange With Welded Plain Collars (with flange F)



$$z = \sqrt{R_z = 160}$$

$$y = \sqrt{R_y = 160}$$

1.2.2. Flanse libere conform DIN 2642 PN 10 Lapped Flanges According to DIN 2642 NP 10



tabel A 1.2.2. table A 1.2.2.

Teava		Dimensiunile flansei in mm					Suruburi			Burdel in mm							Masa (kg) (7.85Kg/dm3)	
Pipe		Flange Dimensions In mm					Screws			Collar in mm							Weight(kg) (7.85Kg/dm3)	
DN mm	d1 mm	d6	D	b	k	e	buc n	filet thread	d2 mm	d5	h3	d4 max	h4 min	s1 min	s2 min	r	Flansa Flange	Burdel Collar
10	14	16	90	14	60	3	4	M 12	14	14.5	10	40	9	1.8	3	3	0.599	0.087
	17.2	19								17.7								
15	20	22	95	14	65	3	4	M 12	14	21	10	45	9	2	3	3	0.689	0.105
	21.3	24								22								
20	25	28	105	14	75	3	4	M 12	14	26	12	58	12	2	3	3	0.805	0.203
	26.9	30								27.6								
25	30	33	115	16	85	4	4	M 12	14	31	12	68	15	2	3	4	1.11	0.276
	33.7	36								34.4								
32	38	42	140	16	100	4	4	M 16	18	39	12	78	15	2.6	3.5	4	1.64	0.343
	42.4	46								43.1								
40	44.5	50	150	16	110	4	4	M 16	18	45.5	12	88	17	2.6	3.5	4	1.86	0.426
	48.3	54								49								
50	57	62	165	16	125	5	4	M16	18	58.1	14	102	23	2.6	3.5	5	2.2	0.618
	60.3	65								61.1								
65	76.1	81	185	16	145	5	4	M16	18	77.1	14	122	23	2.6	3.5	5	2.62	0.786
80	88.9	94	200	18	160	5	8	M 16	18	90.3	16	138	23	3.2	4	5	3.32	1.10
100	108	113	220	18	180	5	8	M 16	18	109.6	16	158	28	3.2	4	5	3.67	1.31
	114.3	119								115.9								
125	133	138	250	18	210	5	8	M 16	18	134.8	18	188	30	3.2	4	5	4.54	1.96
	139.7	145								141.6								

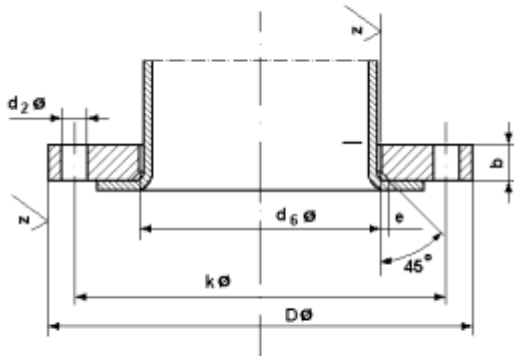
tabel A 1.2.2. (continuare) table A 1.2.2. (continued)

Teava		Dimensiunile flansei in mm					Suruburi			Burdel in mm							Masa (kg) (7.85Kg/dm3)	
Pipe		Flange Dimensions In mm					Screws			Collar in mm							Weight(kg) (7.85Kg/dm3)	
DN mm	d1 mm	d6	D	b	k	e	buc	filet	d2 mm	d5	h3	d4 max	h4 min	s1 min	s2 min	r	Flansa	Burdel
ND mm							n	thread									Flange	Collar
150	159	164	285	18	240	5	8	M20	22	161.1	18	212	30	3.2	4	5	5.60	2.18
	168.3	173								170.5								
200	219.1	225	340	20	295	5	8	M20	22	221.8	20	268	30	3.2	4	5	7.46	3.10
250	267	273	395	22	350	5	12	M20	22	270.2	22	320	30	4	5	5	10.30	4.22
	273	279								276.2								
300	323.9	329	445	26	400	5	12	M20	22	327.6	22	370	35	4	5	5	14.00	4.85
350	355.6	362	505	28	460	6	16	M20	22	359.7	22	430	-	-	-	6	18.50	6.71
	368	374								372.2								
400	406.4	413	565	32	515	6	16	M24	26	411	24	482	-	-	-	6	25.00	8.28
	419	426								423.7								
(450)	457	466	615	38	565	6	20	M24	26	462.5	24	532	-	-	-	6	30.60	9.30
500	508	517	670	38	620	6	20	M24	26	513.6	26	585	-	-	-	6	37.00	11.50
600	609.6	618	780	44	725	7	20	M27	30	616.6	26	685	-	-	-	7	56.30	15.60
700	711	721	895	50	840	7	24	M27	30	718.6	28	800	-	-	-	7	80.40	23.20
800	813	824	1015	56	950	7	24	M30	33	821.5	30	905	-	-	-	7	113.20	29.20

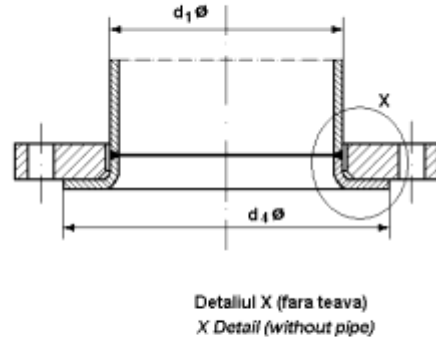
Flansele din otel carbon, din inox sau din aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.

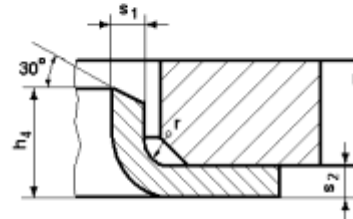
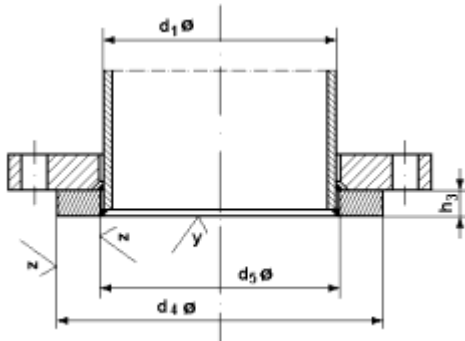
F Flansa libera (reprezentata cu teava bordelata)
Lapped Flange



G Flansa libera cu burdel de sudare (cu flansa F)
Lapped Flange With Welding Burdel (with flange F)



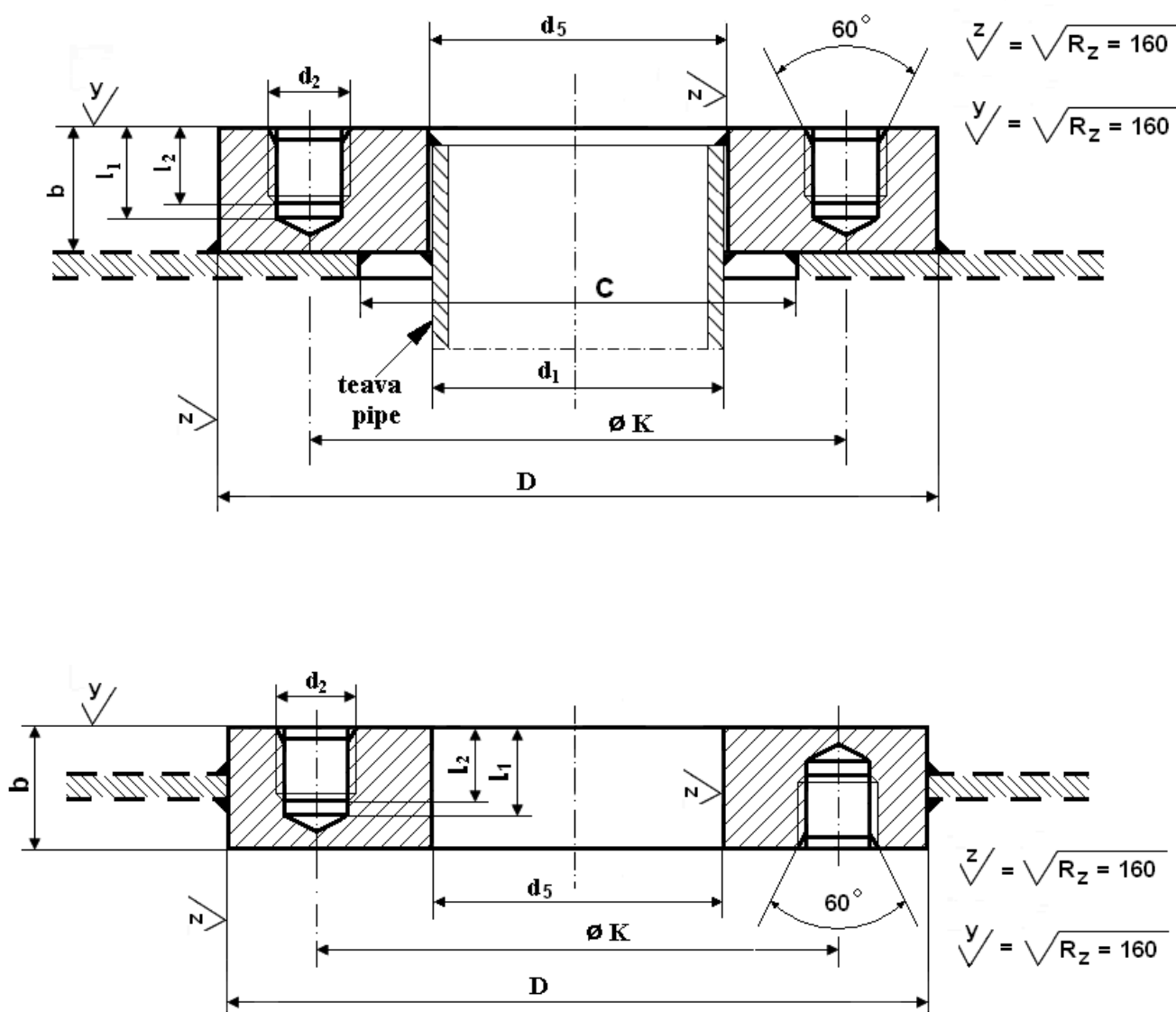
B Flansa libera cu inel pentru sudare (cu flansa F)
Lapped Flange With Welded Plain Collars (with flange F)



$$z = \sqrt{R_z = 160}$$

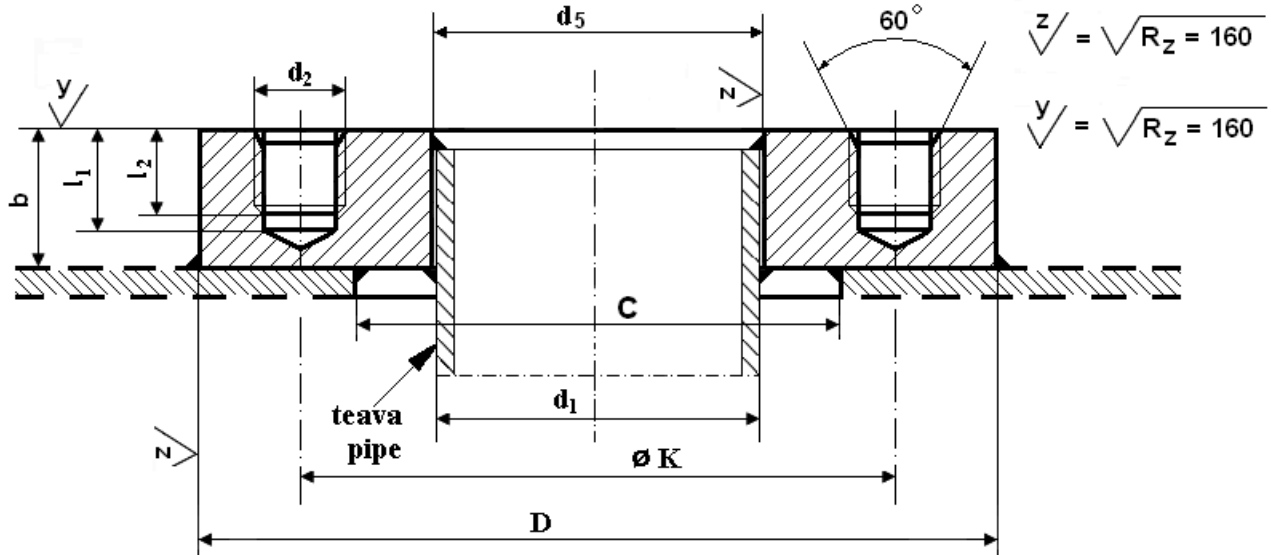
$$y = \sqrt{R_z = 160}$$

1.3. Flanse de perete pentru tancuri si compartimente navale conform standardelor germane (DIN)
Welding Flanges for Tanks and Sea Boxes According to German Standards (DIN)



1.3.1. Flanse de perete cu o fata conform DIN 86041-1 PN 10 si PN 16 Wall Flanges with One Face According to DIN 86041-1 NP 10 and 16

Aceste flanse pot fi in 3 variante constructive: cu teava interioara, fara teava interioara sau incastrate in perete.
These flanges have 3 schedule: with internal pipe, without internal pipe or embedded in the wall.



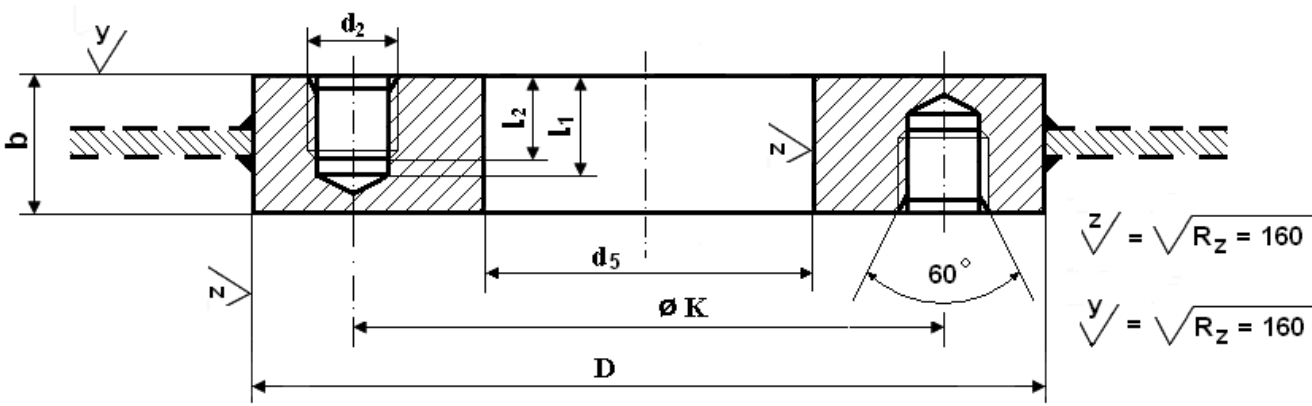
tabel A 1.3.1. table A 1.3.1.

Teava (mm)		Dimensiunile flanseii					Tabla	Suruburi			Masa (kg)					
Pipe (mm)		Flange Dimensions					Plate	Screws			Weight (kg)					
DN pt. PN10	DN pt. PN16	d1 mm	d5 mm	D mm	b mm	k mm	C mm	n	Filet d2 mm	l1 mm	l2 mm	(7.85Kg/dm3)				
ND for NP 10	ND for NP 16								Thread d2 mm							
20		25	26	105	25	75	Se stabileste in functie de varianta constructiva Shall be agreed according schedule	4	M12	19	13	1.81				
		26.9	27.6									1.84				
25		30	31	115	25	85						8	M16	23	17	3.33
		33.7	34.4													4.48
32		42.4	43.1	140	31	100		12	M20	28	21	5.26				
40		48.3	49	150	31	110						6.75				
50		60.3	61.1	165	31	125		16	M24	33	25	9.24				
65		76.1	77.1	185	31	145						12.60				
80		88.9	90.3	200	31	160		20	M27	36	28	14.00				
100		114.3	115.9	220	31	180						15.30				
125		139.7	141.6	250	31	210		24	M30	41	31	19.50				
150		168.3	170.5	285	38	240						21.00				
175		193.7	196.1	315	38	270						27.30				
200	-	219.1	221.8	340	38	295						58.00				
250	-	273.0	276.2	395	38	350						44.60				
300	-	323.9	327.6	445	38	400						44.60				
350	-	355.6	359.7	505	38	460						50.60				
400	-	406.4	411	565	45	515						50.60				
450	-	457	462.3	615	45	565						69.50				
500	-	508	513.6	670	45	620						69.50				
600	-	610	614.6	780	50	725						86.80				
700	-	711	716	895	50	840						86.80				
800	-	813	818.6	1015	56	950						122.00				

Aceste flanse, din otel carbon sau inox, nu se lucreaza pe stoc ele se livreaza doar la comanda ferma.

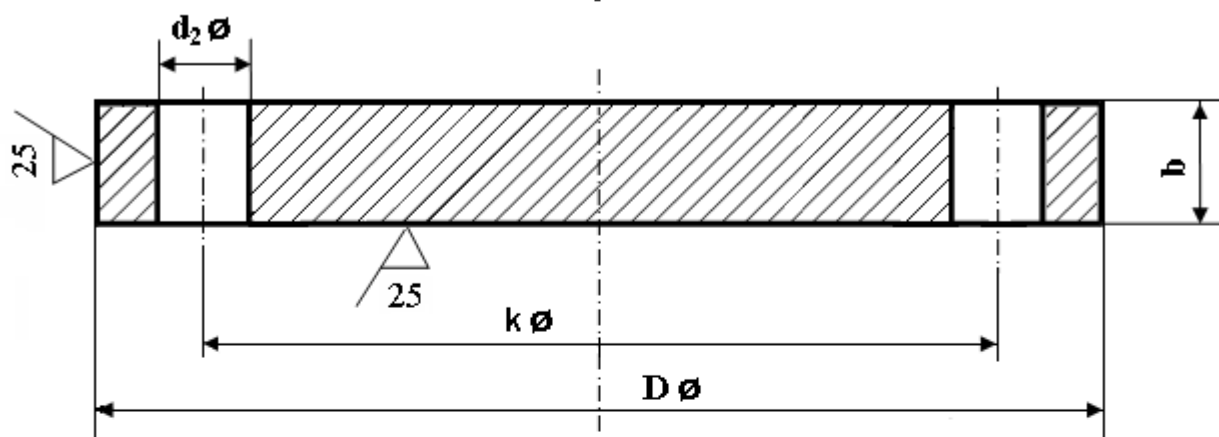
These flanges, from carbon steel or stainless steel, are not in stock they can be delivered only on special order.

1.3.2. Flanse de perete cu doua fete conform DIN
Wall Flanges with Two Faces According to DIN

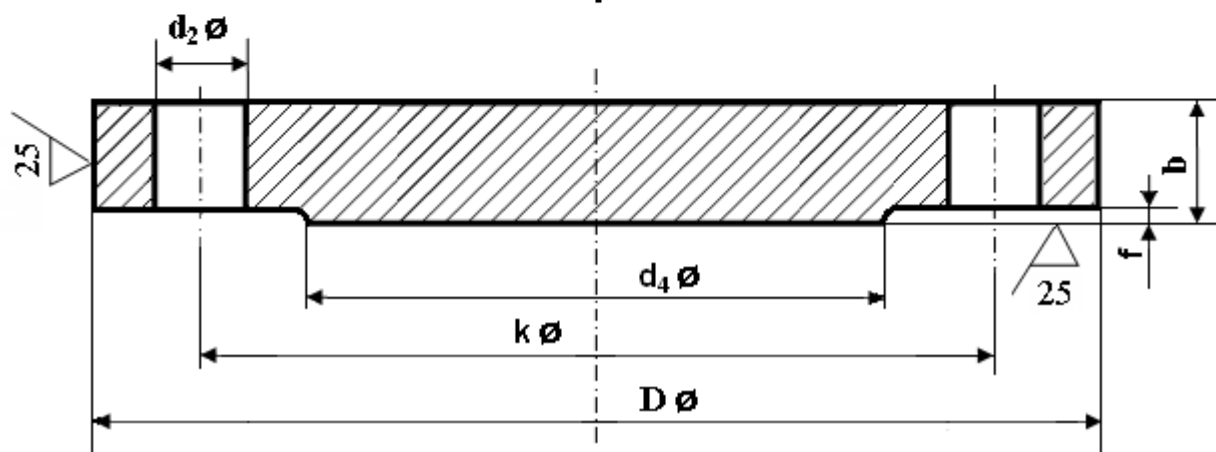


1.4. Flanse oarbe conform standardelor germane (DIN)
Blind Flanges According to German Standards (DIN)

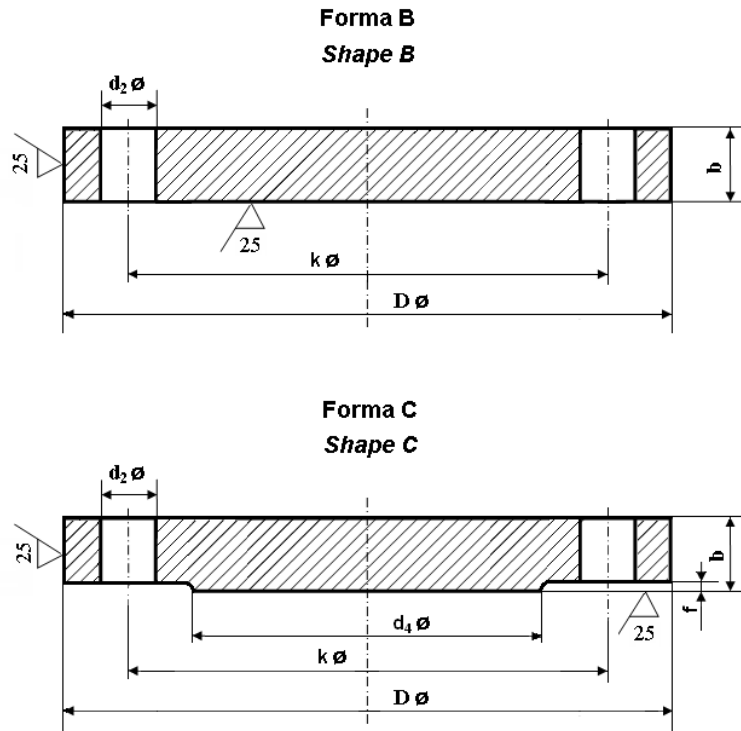
Forma B
Shape B



Forma C
Shape C



1.4.1. Flanse orbe conform DIN 2527 PN 6
Blind Flanges According to DIN 2527 NP 6



tabel A 1.4.1. table A 1.4.1.

DN mm	Dimensiunile flanseii					Suruburi			Masa (Kg)		Material/Calitate		
	Flange Dimensions					Screws			Weight (Kg)		Material/Grades		
ND mm	D mm	b mm	k mm	Forma C		buc n	filet thread	d2 mm	(7.85Kg/dm ³)		Otel	Otel Inox	
				Shape C							Carbon Steel	Stainless Steel	
				d4 mm	f mm				Forma B	Forma C	St 37-2 (S235-J2)	4301/4306 (304/304L)	4401/4404 (316/316L)
10	75	12	50	35	2	4	M10	11.5	0.38	0.33	x	x	x
15	80	12	55	40	2	4	M10	11.5	0.44	0.38	x	x	x
20	90	14	65	50	2	4	M10	11.5	0.65	0.59	x	x	x
25	100	14	75	60	2	4	M10	11.5	0.82	0.74	x	x	x
32	120	14	90	70	2	4	M12	14	1.17	1.07	x	x	x
40	130	14	100	80	3	4	M12	14	1.39	1.21	x	x	x
50	140	14	110	90	3	4	M12	14	1.62	1.43	x	x	x
65	160	14	130	110	3	4	M12	14	2.44	2.21	x	x	x
80	190	16	150	128	3	4	M16	18	3.43	3.09	x	x	x
100	210	16	170	148	3	4	M16	18	4.76	4.37	x	x	x
125	240	18	200	178	3	8	M16	18	6.11	5.68	x	x	x
150	265	18	225	202	3	8	M16	18	7.51	7.02	x	x	x
175	295	20	255	232	3	8	M16	18	10.40	9.85	x	x	x
200	320	20	280	258	3	8	M16	18	12.30	11.70	x	x	x
250	375	22	335	312	3	12	M16	18	18.30	17.60	x	o	o
300	440	22	395	365	4	12	M20	23	25.30	24.00	x	o	o
350	490	22	445	415	4	12	M20	23	31.60	30.10	x	o	o
400	540	22	495	465	4	16	M20	23	38.40	36.40	x	o	o
500	645	24	600	570	4	20	M20	23	60.40	58.10	x	o	o

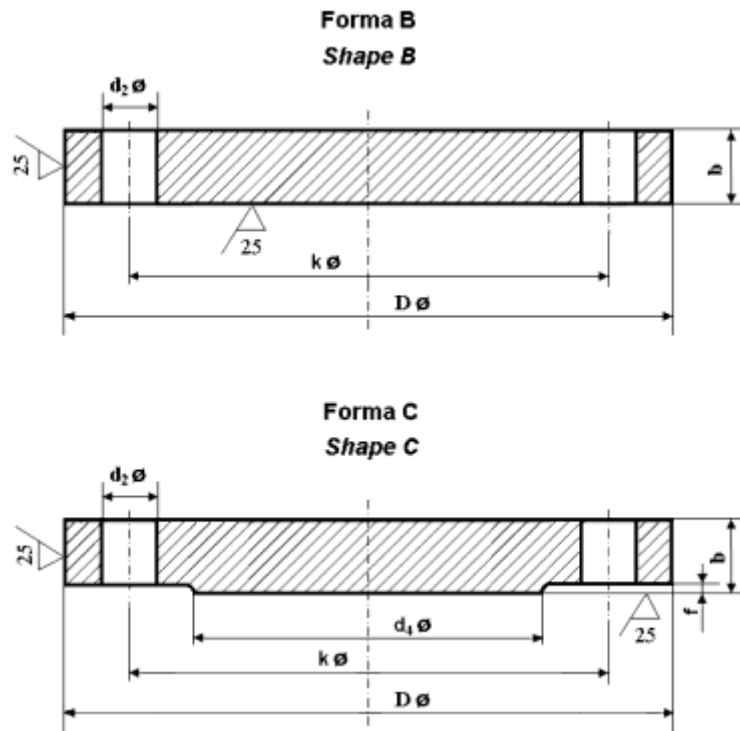
x – Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

x – Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.

o - Se executa numai la comanda.

o - Produced only on order.

1.4.2. Flanse oarbe conform DIN 2527 PN 10
Blind Flanges According to DIN 2527 NP 10



tabel A 1.4.2. table A 1.4.2.

DN mm	Dimensiunile flanseii			Suruburi			Masa (Kg)		Material/Calitate						
	Flange Dimensions			Screws			Weight (Kg)		Material/Grades						
ND mm	D mm	b mm	k mm	Forma C Shape C		buc n	filet thread	d2 mm	(7.85Kg/dm ³)		Otel	Otel Inox			
				d4 mm	f mm				Forma B Shape B	Forma C Shape C	Carbon Steel	Stainless Steel			
													St 37-2 (S235-J2)	4301/4306 (304/304L)	4401/4404 (316/316L)
Se observa ca pentru flansele cu diametrul nominal intre 10 si 175mm dimensiunile coincid cu DIN2527 PN 16															
You may observe that for flanges with the nominal diameter 10 to 175mm the measurement are identical DIN2527 NP 16															
10	90	14	60	40	2	4	M12	14	0.63	0.56	x	x	x		
15	95	14	65	45	2	4	M12	14	0.72	0.64	x	x	x		
20	105	16	75	58	2	4	M12	14	1.01	0.93	x	x	x		
25	115	16	85	68	2	4	M12	14	1.23	1.13	x	x	x		
32	140	16	100	78	2	4	M16	18	1.80	1.66	x	x	x		
40	150	16	110	88	3	4	M16	18	2.09	1.85	x	x	x		
50	165	18	125	102	3	4	M16	18	2.88	2.59	x	x	x		
65	185	18	145	122	3	4	M16	18	3.66	3.33	x	x	x		
80	200	20	160	138	3	8	M16	18	4.77	4.34	x	x	x		
100	220	20	180	158	3	8	M16	18	5.65	5.26	x	x	x		
125	250	22	210	188	3	8	M16	18	8.42	7.67	x	x	x		
150	285	22	240	212	3	8	M20	23	10.40	9.85	x	x	x		
175	315	24	270	242	3	8	M20	23	14.00	13.50	x	x	x		
200	340	24	295	268	3	8	M20	23	16.50	15.60	x	x	x		
250	395	26	350	320	3	12	M20	23	24.00	23.10	x	o	o		
300	445	26	400	370	4	12	M20	23	30.90	29.40	x	o	o		
350	505	26	460	430	4	16	M20	23	40.60	38.00	x	o	o		
400	565	26	515	482	4	16	M24	27	49.40	47.50	x	o	o		
500	670	28	620	585	4	20	M24	27	75.00	72.70	x	o	o		

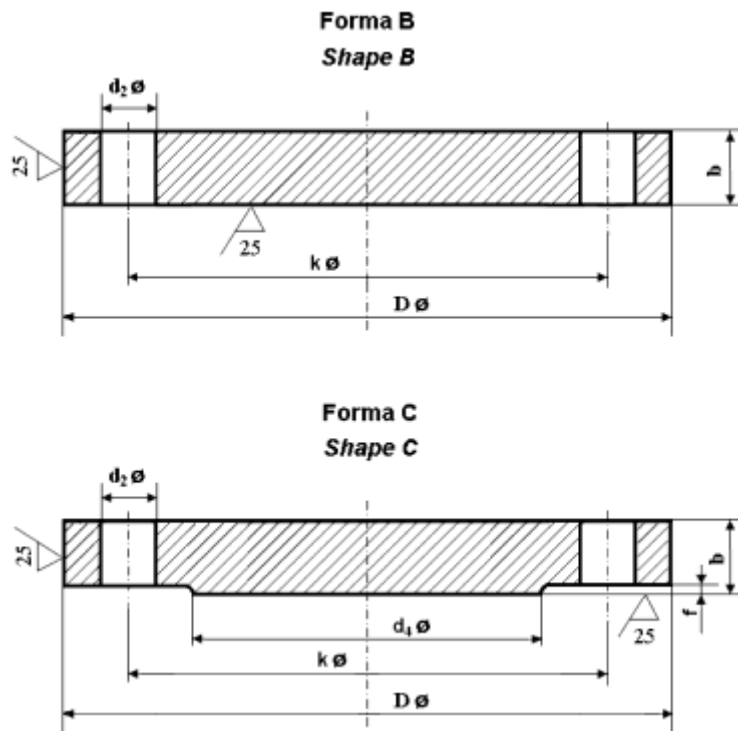
x – Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

x – Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.

o - Se executa numai la comanda.

o - Produced only on order.

1.4.3. Flanse orbe conform DIN 2527 PN 16
Blind Flanges According to DIN 2527 NP 16



tabel A 1.4.3. table A1.4.3.

DN mm	Dimensiunile flanseii			Suruburi			Masa (Kg)		Material/Calitate				
	Flange Dimensions			Screws			Weight (Kg)		Material/Grades				
ND mm	D mm	b mm	k mm	Forma C Shape C		buc n	filet thread	d2 mm	(7.85Kg/dm ³)		Otel	Otel Inox	
				d4 mm	f mm				Forma B Shape B	Forma C Shape C	Carbon Steel	Stainless Steel	
											St 37-2 (S235-J2)	4301/4306 (304/304L)	4401/4404 (316/316L)
10	90	14	60	40	2	4	M12	14	0.63	0.56	x	x	x
15	95	14	65	45	2	4	M12	14	0.72	0.64	x	x	x
20	105	16	75	58	2	4	M12	14	1.01	0.93	x	x	x
25	115	16	85	68	2	4	M12	14	1.23	1.13	x	x	x
32	140	16	100	78	2	4	M16	18	1.80	1.66	x	x	x
40	150	16	110	88	3	4	M16	18	2.09	1.85	x	x	x
50	165	18	125	102	3	4	M16	18	2.88	2.59	x	x	x
65	185	18	145	122	3	4	M16	18	3.66	3.33	x	x	x
80	200	20	160	138	3	8	M16	18	4.77	4.34	x	x	x
100	220	20	180	158	3	8	M16	18	5.65	5.26	x	x	x
125	250	22	210	188	3	8	M16	18	8.42	7.67	x	x	x
150	285	22	240	212	3	8	M20	23	10.40	9.85	x	x	x
175	315	24	270	242	3	8	M20	23	14.00	13.50	x	x	x
200	340	24	295	268	3	12	M20	23	16.10	15.60	x	x	x
250	405	26	355	320	3	12	M24	27	24.90	23.90	x	o	o
300	460	28	410	378	4	12	M24	27	35.10	33.60	x	o	o
350	520	30	470	438	4	16	M24	27	47.80	46.20	x	o	o
400	580	32	525	490	4	16	M27	30	63.50	61.50	x	o	o
500	715	34	650	610	4	20	M30	33	102.00	99.50	x	o	o

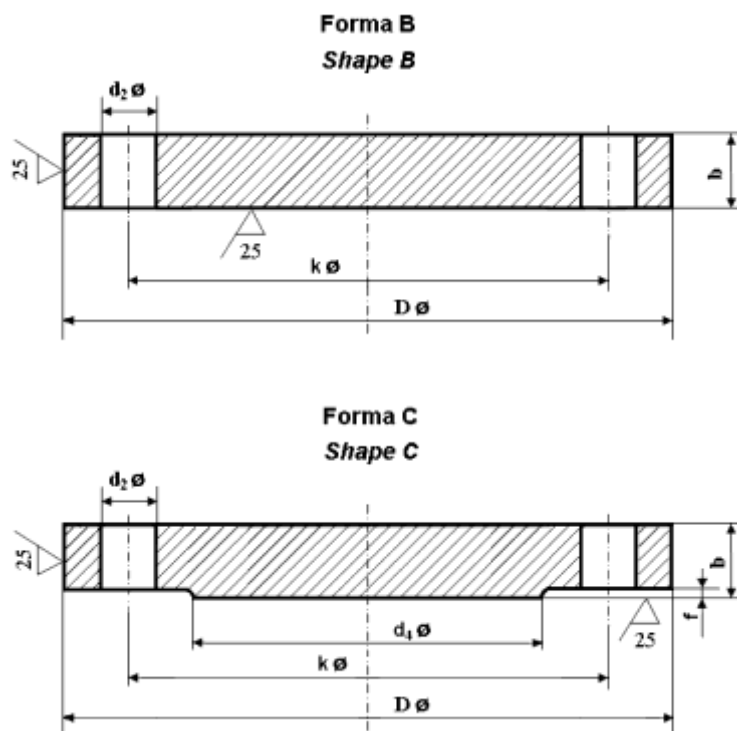
x – Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

x – Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.

o - Se executa numai la comanda.

o - Produced only on order.

1.4.4. Flanse oarbe conform DIN 2527 PN 25 Blind Flanges According to DIN 2527 NP 25

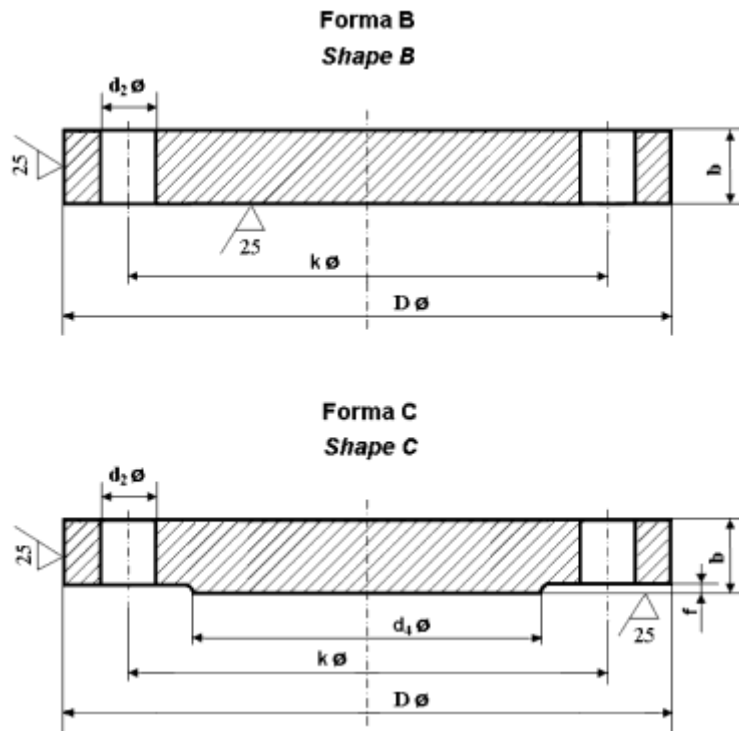


tabel A 1.4.4. table A 1.4.4.

DN mm	Dimensiunile flanseii					Suruburi			Masa (Kg)		Material/Calitate		
	Flange Dimensions					Screws			Weight (Kg)		Material/Grades		
ND mm	D mm	b mm	K mm	Forma C		buc	filet	d2 mm	(7.85Kg/dm ³)		Otel	Otel Inox	
				Shape C							Carbon Steel	Stainless Steel	
				d4 mm	f mm	n	thread		Forma B	Forma C	Rst 37-2 (S235-J2)	4301/4306 (304/304L)	4401/4404 (316/316L)
Se observa ca pentru flansele cu diametrul nominal intre 10 si 150mm dimensiunile coincid cu DIN2527 PN 40 You may observe that for flanges with the nominal diameter 10 to 150mm the measurement are identical DIN2527 NP 40													
10	90	16	60	40	2	4	M12	14	0.72	0.62	x	x	x
15	95	16	65	45	2	4	M12	14	0.81	0.74	x	x	x
20	105	18	75	58	2	4	M12	14	1.24	1.05	x	x	x
25	115	18	85	68	2	4	M12	14	1.38	1.31	x	x	x
32	140	18	100	78	2	4	M16	18	2.03	1.82	x	x	x
40	150	18	110	8	3	4	M16	18	2.35	2.11	x	x	x
50	165	20	125	102	3	4	M16	18	3.20	2.91	x	x	x
65	185	22	145	122	3	8	M16	18	4.29	4.13	x	x	x
80	200	24	160	138	3	8	M16	18	5.88	5.21	x	x	x
100	235	24	190	162	3	8	M20	23	7.54	7.08	x	x	x
125	270	26	220	188	3	8	M24	27	10.80	10.40	x	x	x
150	300	28	250	218	3	8	M24	27	14.50	13.90	x	x	x
175	330	28	280	248	3	12	M24	27	17.3	16.50	x	x	x
200	360	30	310	278	3	12	M24	27	22.3	21.50	x	x	x
250	425	32	370	335	3	12	M27	30	33.5	32.50	x	o	o
300	485	34	430	395	4	16	M27	30	46.3	44.70	x	o	o
350	555	38	490	450	4	16	M30	33	68.0	65.90	x	o	o
400	620	40	550	505	4	16	M33	36	89.7	87.00	x	o	o
500	730	44	660	615	4	20	M33	36	138	134.00	x	o	o

x – Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.
x – Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.
o - Se executa numai la comanda.
o - Produced only on order.

1.4.5. Flanse orbe conform DIN 2527 PN 40
Blind Flanges According to DIN 2527 NP 40



tabel A 1.4.5. table A 1.4.5.

DN mm	Dimensiunile flanseii				Suruburi			Masa (Kg)		Material/Calitate			
	Flange Dimensions				Screws			Weight (Kg)		Material/Grades			
ND mm	D mm	b mm	k mm	Forma C		buc n	filet thread	d2 mm	(7.85Kg/dm3)		Otel	Otel Inox	
				Shape C					Carbon Steel	Stainless Steel			
				d4 mm	f mm					St 37-2 (S235-J2)	4301/4306 (304/304L)	4401/4404 (316/316L)	
Forma B		Forma C											
Shape B		Shape C											
10	90	16	60	40	2	4	M12	14	0.72	0.62	x	x	x
15	95	16	65	45	2	4	M12	14	0.81	0.74	x	x	x
20	105	18	75	58	2	4	M12	14	1.24	1.05	x	x	x
25	115	18	85	68	2	4	M12	14	1.38	1.31	x	x	x
32	140	18	100	78	2	4	M16	18	2.03	1.82	x	x	x
40	150	18	110	8	3	4	M16	18	2.35	2.11	x	x	x
50	165	20	125	102	3	4	M16	18	3.20	2.91	x	x	x
65	185	22	145	122	3	8	M16	18	4.29	4.13	x	x	x
80	200	24	160	138	3	8	M16	18	5.88	5.21	x	x	x
100	235	24	190	162	3	8	M20	23	7.54	7.08	x	x	x
125	270	26	220	188	3	8	M24	27	10.80	10.40	x	x	x
150	300	28	250	218	3	8	M24	27	14.50	13.90	x	x	x
175	350	32	295	260	3	12	M27	30	22.10	21.30	x	x	x
200	375	34	320	285	3	12	M27	30	27.20	26.20	x	x	x
250	450	38	385	345	3	12	M30	33	43.80	43.10	x	o	o
300	515	42	450	410	4	16	M30	33	63.30	62.20	x	o	o
350	580	46	510	465	4	16	M33	36	89.50	87.20	x	o	o
400	660	50	585	535	4	16	M36	39	127.00	124.00	x	o	o
500	755	52	670	615	4	20	M39	42	172.00	168.00	x	o	o

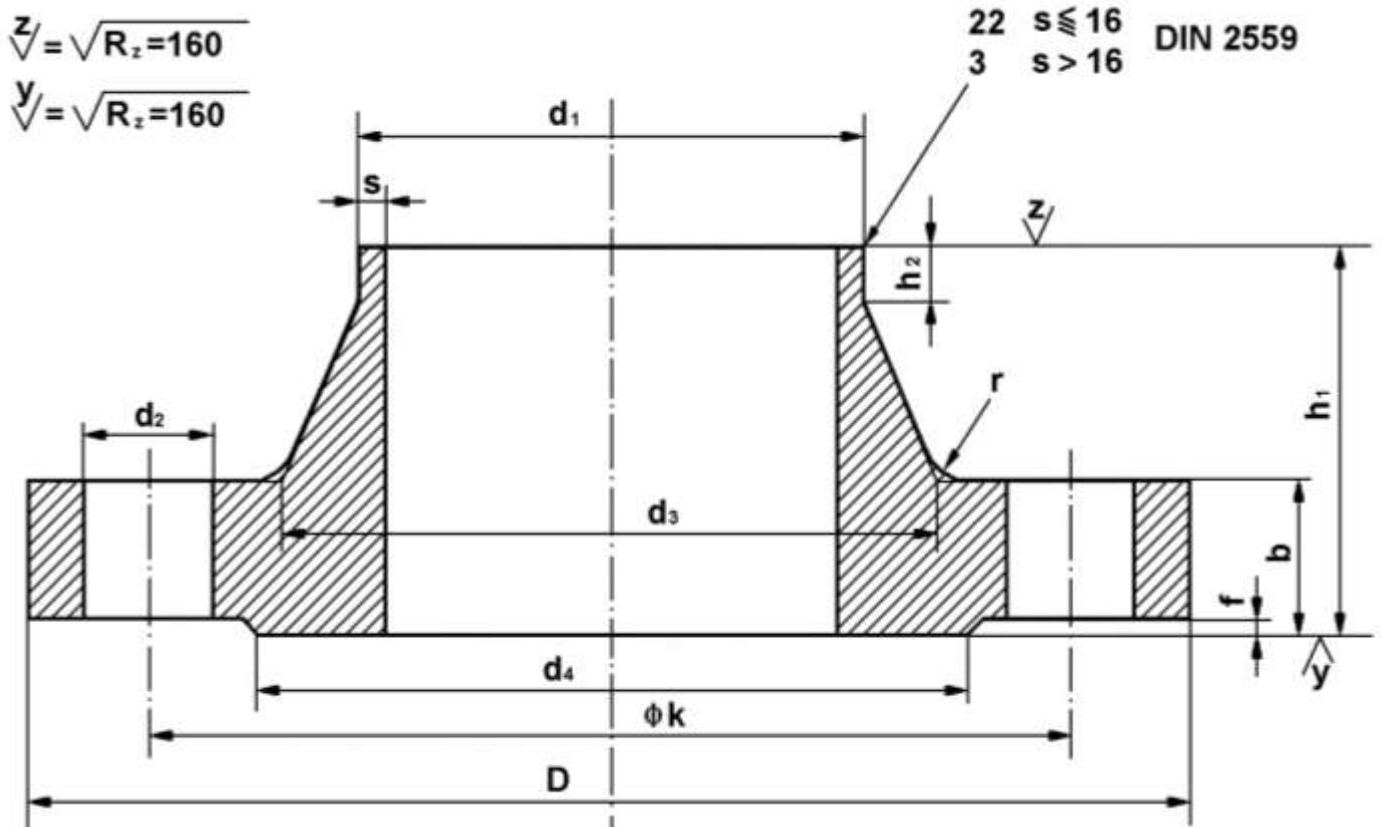
x – Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

x – Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.

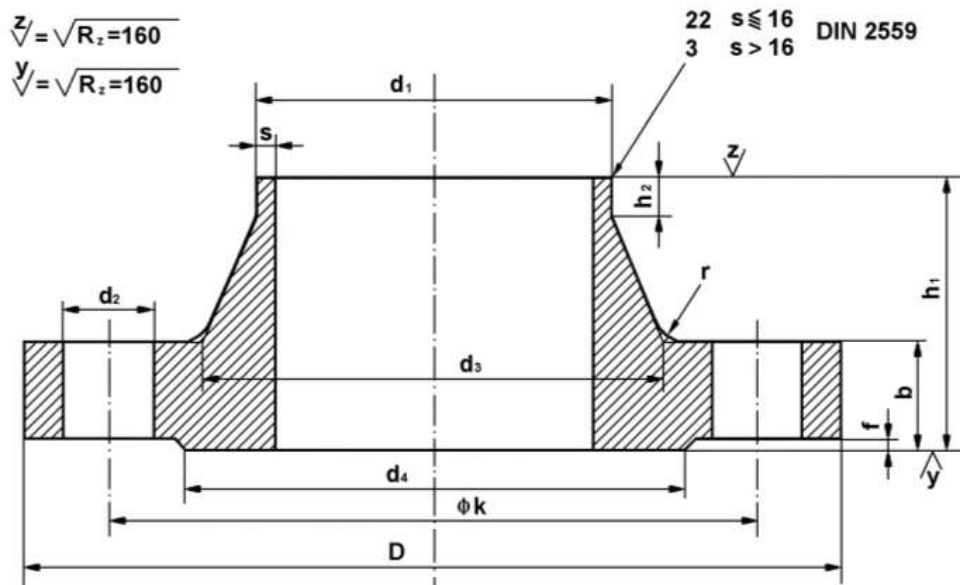
o - Se executa numai cu comanda.

o - Produced only on order.

1.5. Flanse cu gat conform standardelor germane (DIN)
Welding Neck Flanges According to German Standards (DIN)



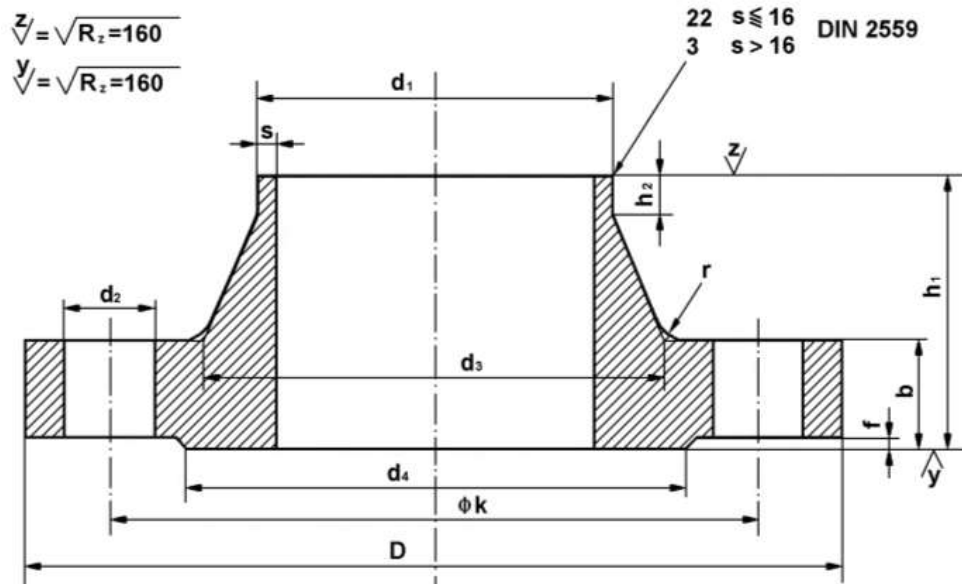
1.5.1. Flanse cu gat conform DIN 2630 PN 1-2.5
Welding Neck Flanges According to DIN 2630 NP 1-2.5



tabel A 1.5.1. table A 1.5.1.

Teava		Dimensiunile flansei				Gat				Etansare		Suruburi		Masa (kg)	
Pipe		Flange Dimensions				Neck				Raised		Screws		Weight (kg)	
DN mm	d1 mm	D mm	b mm	k mm	h1 mm	d3 mm	s mm	r mm	h2 mm	d4 mm	f mm	n	Filet Thread	d2 mm	(7.85Kg/dm ³)
ND mm															
Pentru diametre nominale intre 10-1000mm vezi DIN 2631 PN 6 For nominal diametres 10-1000mm see DIN 2631 NP 6															
1200	1220	1375	26	1320	70	1245	7	16	16	1280	5	32	M27	30	73.90
1400	1420	1575	26	1520	70	1445	7	16	16	1480	5	36	M27	30	85.50
1600	1620	1790	26	1730	80	1645	8	16	20	1690	5	40	M27	30	108.00
1800	1820	1990	26	1930	80	1845	9	16	20	1890	5	44	M27	30	125.00
2000	2020	2190	26	2130	80	2045	10	16	22	2090	5	48	M27	30	138.00
2200	2220	2405	28	2340	90	2248	10	18	25	2295	6	52	M30	33	172.00
2400	2420	2605	28	2540	90	2448	10	18	25	2495	6	56	M30	33	196.00
2600	2620	2805	28	2740	90	2648	10	18	25	2695	6	60	M30	33	203.00
2800	2820	3030	30	2960	90	2848	10	18	25	2910	6	64	M33	36	259.00
3000	3020	3230	30	3160	90	3050	10	18	25	3110	6	68	M33	36	292.00
3200	3220	3430	30	3360	90	3250	10	20	25	3310	6	72	M33	36	294.00
3400	3420	3630	32	3560	95	3450	10	20	28	3510	6	76	M33	36	331.00
3600	3620	3840	32	3770	100	3652	10	20	28	3720	6	80	M33	36	402.00
3800	3820	4045	34	3970	100	3852	10	20	28	3920	6	80	M36	39	416.00
4000	4020	4245	34	4170	100	4052	10	20	28	4120	6	84	M36	39	437.00
Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.															
Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.															

1.5.2. Flanse cu gat conform DIN 2631 PN 6
Welding Neck Flanges According to DIN 2631 NP 6



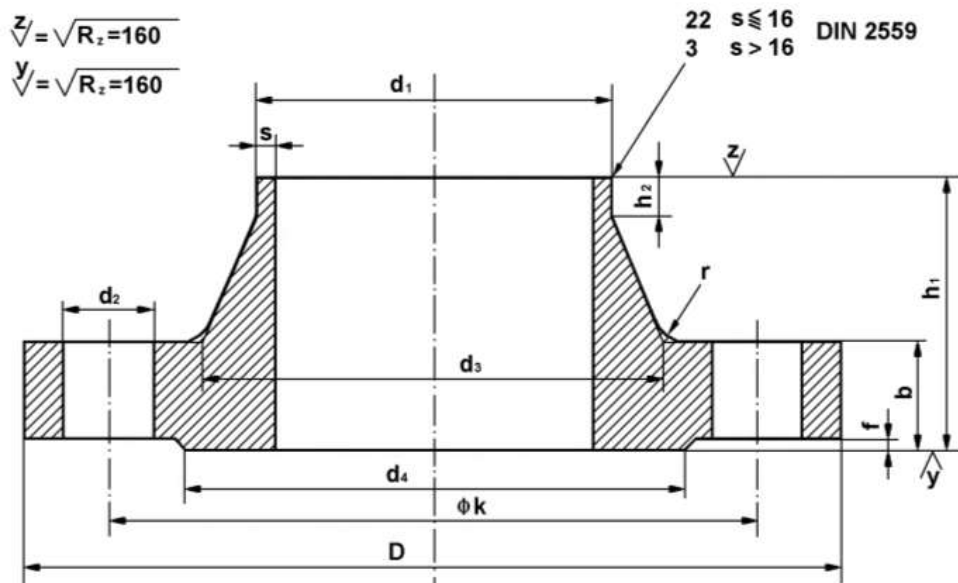
tabel A 1.5.2. table A 1.5.2.

Teava		Dimensiunile flanseii				Gat				Etansare		Suruburi		Masa (kg)	
Pipe		Flange Dimensions				Neck				Raised		Screws		Weight (kg)	
DN mm	d1 mm	D mm	b mm	k mm	h1 mm	d3 mm	s mm	r mm	h2 mm	d4 mm	f mm	n	Filet Thread	d2 mm	(7.85Kg/dm ³)
ND mm															
10	14 17.2	75	12	50	28	22 26	1.8	4	6	35	2	4	M10	11	0.335
15	20 21.3	80	12	55	30	28 30	2	4	6	40	2	4	M10	11	0.392
20	25 26.9	90	14	65	32	35 38	2.3	4	6	50	2	4	M10	11	0.592
25	30 33.7	100	14	75	35	40 42	2.6	4	6	60	2	4	M10	11	0.747
32	38 42.4	120	14	90	35	50 55	2.6	6	6	70	2	4	M12	14	1.05
40	44.5 48.3	130	14	100	38	58 62	2.6	6	7	80	3	4	M12	14	1.18
50	57 60.3	140	14	110	38	70 74	2.9	6	8	90	3	4	M12	14	1.34
65	76.1	160	14	130	38	88	2.9	6	9	110	3	4	M12	14	1.67
80	88.9	190	16	150	42	102	3.2	8	10	128	3	4	M16	18	2.71
100	108 114.3	210	16	170	45	122 130	3.6	8	10	148	3	4	M16	18	3.24
125	133 139.7	240	18	200	48	148 155	4	8	10	178	3	8	M16	18	4.49
150	159 168.3	265	18	225	48	172 184	4.5	10	12	202	3	8	M16	18	5.15
200	219.1	320	20	280	55	236	5.9	10	15	258	3	8	M16	18	7.78
250	267 273	375	22	335	60	282 290	6.3	12	15	312	3	12	M16	18	10.80

tabel A 1.5.2. (continuare) table A 1.5.2. (continued)

Teava		Dimensiunile flansei				Gat				Etansare		Suruburi		Masa (kg)	
Pipe		Flange Dimensions				Neck				Raised		Screws		Weight (kg)	
DN mm	d1 mm	D mm	b mm	k mm	h1 mm	d3 mm	s mm	r mm	h2 mm	d4 mm	f mm	n	Filet Thread	d2 mm	(7.85Kg/dm3)
ND mm															
300	323.9	440	22	395	62	342	7.1	12	15	365	4	12	M20	22	14.00
350	355.6	490	22	445	62	385	7.1	12	15	415	4	12	M 20	22	18.50
	368														16.70
400	406.4	540	22	495	65	438	7.1	12	15	465	4	16	M20	22	21.20
	419														19.00
500	508	645	24	600	68	538	7.1	12	15	570	4	20	M20	22	28.60
600	610	755	24	705	70	640	7.1	12	16	670	5	20	M24	26	31.50
700	711	860	24	810	70	740	7.1	12	16	775	5	24	M24	26	37.40
800	813	975	24	920	70	842	7.1	12	16	880	5	24	M 27	30	46.10
900	914	1075	26	1020	70	942	7.1	12	16	980	5	24	M27	30	55.60
1000	1016	1175	26	1120	70	1045	7.1	16	16	1080	5	28	M27	30	61.90
1200	1220	1405	28	1340	90	1248	8	16	20	1295	5	32	M30	33	100.00
1400	1420	1630	32	1560	90	1452	8	16	20	1510	5	36	M33	36	149.00
1600	1620	1830	34	1760	90	1655	9	16	20	1710	5	40	M33	36	180.00
1800	1820	2045	36	1970	100	1855	10	16	20	1920	5	44	M36	39	225.00
2000	2020	2265	38	2180	110	2058	11	16	25	2125	5	48	M39	42	295.00
2200	2220	2475	42	2390	115	2260	12	18	25	2335	6	52	M39	42	361.00
2400	2420	2685	44	2600	125	2462	13	18	25	2545	6	56	M39	42	415.00
2600	2620	2905	46	2810	130	2665	14	18	25	2750	6	60	M45	48	530.00
2800	2820	3115	48	3020	135	2865	15	18	30	2960	6	64	M45	48	643.00
3000	3020	3315	50	3220	140	3068	16	18	30	3160	6	68	M45	48	777.00
3200	3220	3525	54	3430	150	3272	16	20	30	3370	6	72	M45	48	851.00
3400	3420	3735	56	3640	160	3475	18	20	35	3580	6	76	M45	48	993.00
3600	3620	3970	60	3860	165	3678	18	20	35	3790	6	80	M 52	56	1001.00
Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.															
Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.															

1.5.3. Flanse cu gat conform DIN 2632 PN 10 Welding Neck Flanges According to DIN 2632 NP 10



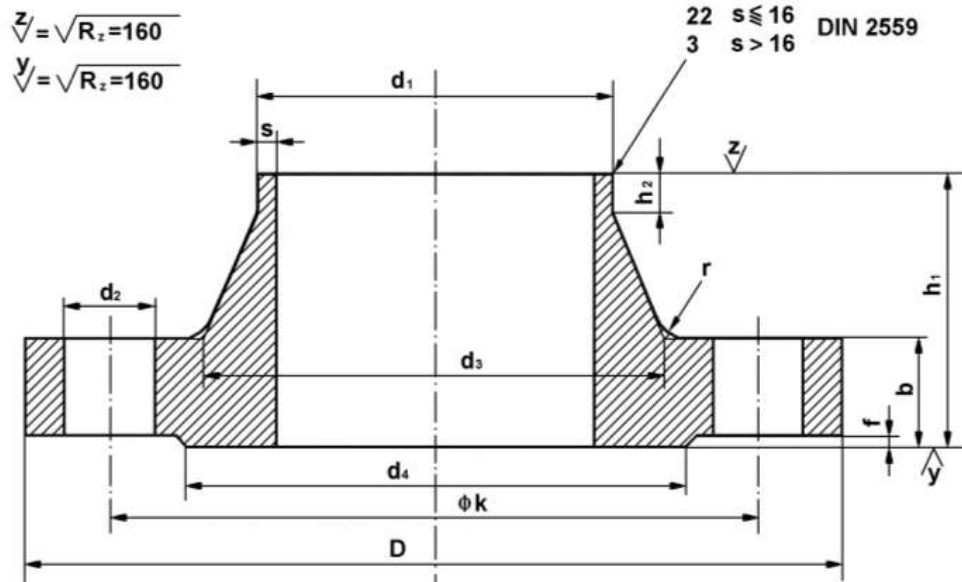
tabel A 1.5.3. table A 1.5.3.

Teava		Dimensiunile flanseii				Gat				Etansare		Suruburi		Masa (kg)	
Pipe		Flange Dimensions				Neck				Raised		Screws		Weight (kg)	
DN mm	d1 mm	D mm	b mm	k mm	h1 mm	d3 mm	s mm	r mm	h2 mm	d4 mm	f mm	n	Filet Thread	d2 mm	(7.85Kg/d3)
Pentru diametre nominale intre 10-150mm vezi DIN 2633 PN 16 For nominal diametres 10-150mm see DIN 2633 NP 16															
200	219.1	340	24	295	62	235	5.9	10	16	268	3	8	M20	22	11.30
250	267	395	26	350	68	285	6.3	12	16	320	3	12	M20	22	14.70
	273														
300	323.9	445	26	400	68	344	7.1	12	16	370	4	12	M20	22	17.40
350	355.6	505	26	460	68	385	7.1	12	16	430	4	16	M20	22	23.60
	368														21.60
400	406.4	565	26	515	72	440	7.1	12	16	482	4	16	M24	26	28.60
	419														26.20
(450)	457	615	28	565	72	488	7.1	12	16	532	4	20	M24	26	31.50
500	508	670	28	620	75	542	7.1	12	16	585	4	20	M24	26	38.10
600	610	780	28	725	80	642	7.1	12	18	685	5	20	M27	30	44.60
700	711	895	30	840	80	745	8	12	18	800	5	24	M27	30	62.40
800	813	1015	32	950	90	850	8	12	18	905	5	24	M30	33	84.10
900	914	1115	34	1050	95	950	10	12	20	1005	5	28	M30	33	98.50
1000	1016	1230	34	1160	95	1052	10	16	20	1110	5	28	M33	36	115.00
1200	1220	1455	38	1380	115	1255	11	16	25	1330	5	32	M36	39	182.00
1400	1420	1675	42	1590	120	1460	12	16	25	1535	5	36	M39	42	248.00
1600	1620	1915	46	1820	130	1665	14	16	25	1760	5	40	M45	48	347.00
1800	1820	2115	50	2020	140	1868	15	16	30	1960	5	44	M45	48	430.00
2000	2020	2325	54	2230	150	2072	16	16	30	2170	5	48	M45	48	539.00
2200	2220	2550	58	2440	160	2275	18	18	35	2370	6	52	M 52	56	658.00
2400	2420	2760	62	2650	170	2478	20	18	35	2570	6	56	M 52	56	825.00
2600	2620	2960	66	2850	180	2680	22	18	40	2780	6	60	M 52	56	979.00
2800	2820	3180	70	3070	190	2882	22	18	40	3000	6	64	M 52	56	1156.00
3000	3020	3405	75	3290	200	3085	24	18	45	3210	6	68	M 56	62	1402.00

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

1.5.4. Flanse cu gat conform DIN 2633 PN 16
Welding Neck Flanges According to DIN 2633 NP 16



tabel A 1.5.4. table A 1.5.4.

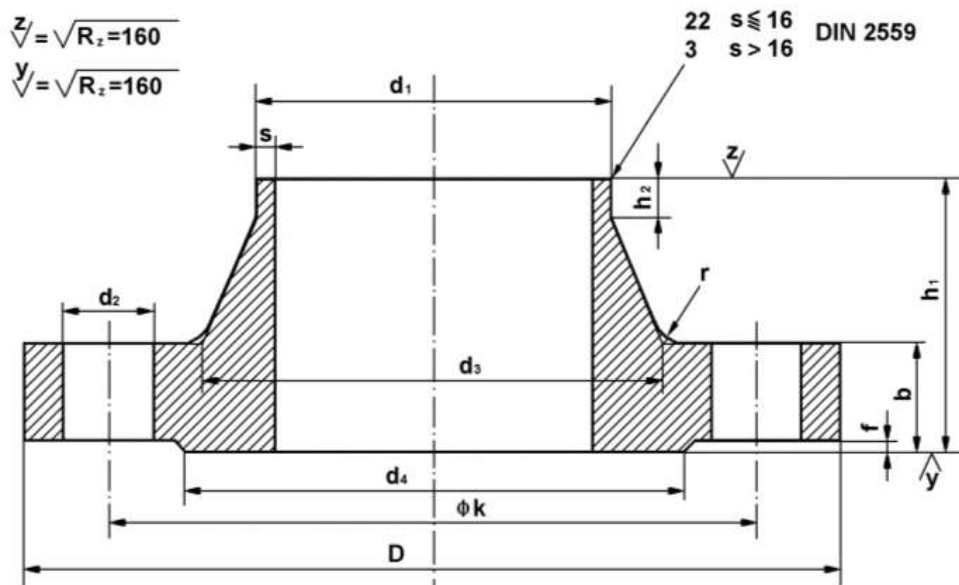
Teava		Dimensiunile flanseii				Gat				Etansare		Suruburi		Masa (kg)	
Pipe		Flange Dimensions				Neck				Raised		Screws		Weight (kg)	
DN mm	d1 mm	D mm	b mm	k mm	h1 mm	d3 mm	s mm	r mm	h2 mm	d4 mm	f mm	n	Filet Thread	d2 mm	(7.85Kg/dm3)
ND mm															
10	14 17.2	90	14	60	35	25 28	1.8	4	6	40	2	4	M12	14	0.580
15	20 21.3	95	14	65	35	30 32	2	4	6	45	2	4	M12	14	0.648
20	25 26.9	105	16	75	38	38 40	2.3	4	6	58	2	4	M12	14	0.952
25	30 33.7	115	16	85	38	42 45	2.6	4	6	68	2	4	M12	14	1.14
32	38 42.4	140	16	100	40	52 56	2.6	6	6	78	2	4	M16	18	1.69
40	44.5 48.3	150	16	110	42	60 64	2.6	6	7	88	3	4	M16	18	1.86
50	57 60.3	165	18	125	45	72 75	2.9	6	8	102	3	4	M16	18	2.53
65	76.1	185	18	145	45	90	2.9	6	10	122	3	4	M16	18	3.06
80	88.9	200	20	160	50	105	3.2	8	10	138	3	8	M16	18	3.70
100	108 114.3	220	20	180	52	125 131	3.6	8	12	158	3	8	M16	18	4.62
125	133 139.7	250	22	210	55	150 156	4	8	12	188	3	8	M16	18	6.30
150	159 168.3	285	22	240	55	175 184	4.5	10	12	212	3	8	M20	22	7.75
(175)	193.7	315	24	270	60	210	5.4	10	12	242	3	8	M20	22	9.85
200	219.1	340	24	295	62	235	5.9	10	16	268	3	12	M20	22	11.00
250	267 273	405	26	355	70	285 292	6.3	12	16	320	3	12	M24	26	15.60

tabel A 1.5.4. (continuare) table A 1.5.4. (continued)

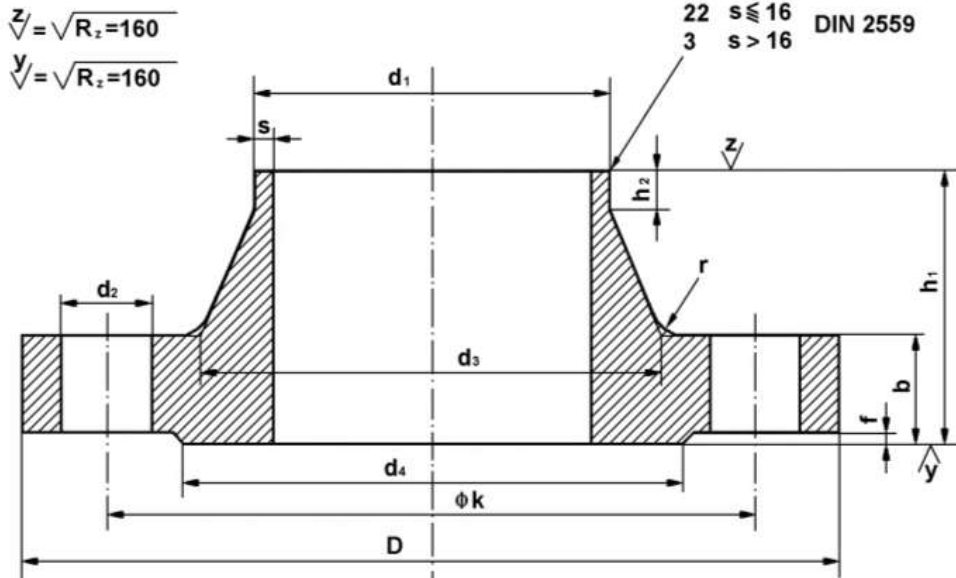
Teava		Dimensiunile flanseii				Gat				Etansare		Suruburi		Masa (kg)	
Pipe		Flange Dimensions				Neck				Raised		Screws		Weight (kg)	
DN mm	d1 mm	D mm	b mm	k mm	h1 mm	d3 mm	s mm	r mm	h2 mm	d4 mm	f mm	n	Filet Thread	d2 mm	(7.85Kg/dm3)
ND mm															
300	323.9	460	28	410	78	344	7.1	12	16	378	4	12	M24	26	22.00
350	355.6	520	30	470	82	390	8	12	16	438	4	16	M24	26	31.20
	368														28.80
400	406.4	580	32	525	85	445	8	12	16	490	4	16	M27	30	39.30
	419														36.30
(450)	457	640	34	585	85	490	8	12	16	550	4	20	M27	30	44.30
500	508	715	34	650	90	548	8	12	16	610	4	20	M30	33	61.00
600	610	840	36	770	95	652	8.8	12	18	725	5	20	M33	36	75.40
700	711	910	36	840	100	755	8.8	12	18	795	5	24	M33	36	77.00
800	813	1025	38	950	105	855	10	12	20	900	5	24	M36	39	101.00
900	914	1125	40	1050	110	955	10	12	20	1000	5	28	M36	39	122.00
1000	1016	1255	42	1170	120	1058	10	16	22	1115	5	28	M39	42	162.00
1200	1220	1485	48	1390	130	1262	12.5	16	30	1330	5	32	M45	48	243.00
1400	1420	1685	52	1590	145	1465	14.2	16	30	1530	5	36	M45	48	323.00
1600	1620	1930	58	1820	160	1668	16	16	35	1750	5	40	M52	56	479.00
1800	1820	2130	62	2020	170	1870	17.5	16	35	1950	5	44	M52	56	599.00
2000	2020	2345	66	2230	180	2072	20	16	40	2150	5	48	M56	62	719.00

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.



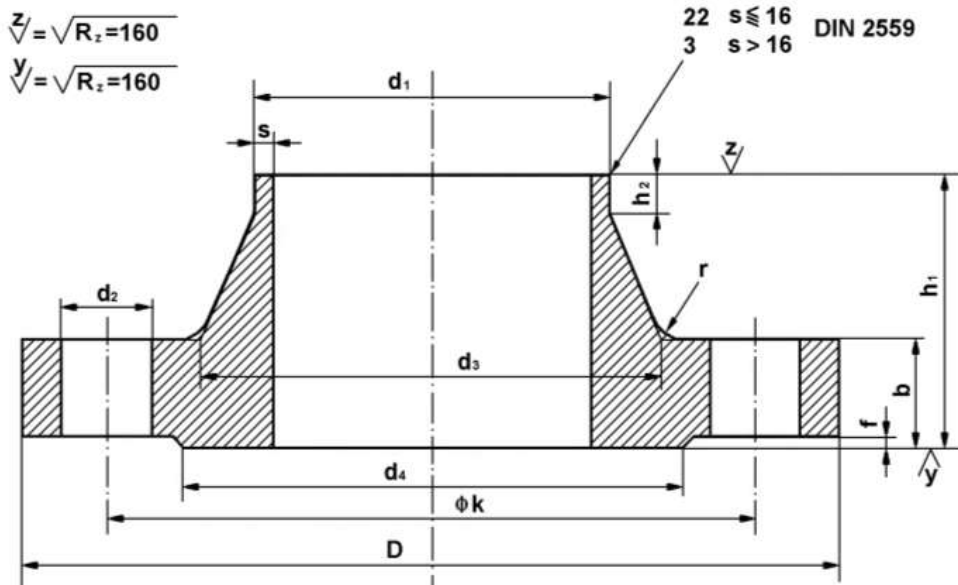
1.5.5. Flanse cu gat conform DIN 2634 PN 25
Welding Neck Flanges According to DIN 2634 NP 25



tabel A 1.5.5. table A 1.5.5.

Teava		Dimensiunile flanseii				Gat				Etansare		Suruburi		Masa(kg)	
Pipe		Flange Dimensions				Neck				Raised		Screws		Weight(kg)	
DN mm	d1 mm	D mm	b mm	k mm	h1 mm	d3 mm	s mm	r mm	h2 mm	d4 mm	f mm	n	Filet Thread	d2 mm	7.85Kg/dm3
ND mm															
Pentru diametre nominale intre 10-150mm vezi DIN 2635 PN 40 For nominal diametres 10-150mm see DIN 2635 NP 40															
(175)	193.7	330	28	280	75	218	5.6	10	15	248	3	12	M24	26	13.40
200	219.1	360	30	310	80	244	6.3	10	16	278	3	12	M24	26	17.00
250	267	425	32	370	88	292	7.1	12	18	335	3	12	M27	30	24.40
	298														
300	323.9	485	34	430	92	352	8	12	18	395	4	16	M27	30	31.20
350	355.6	555	38	490	100	398	8	12	20	450	4	16	M30	33	47.20
	368														44.20
400	406.4	620	40	550	110	452	8.8	12	20	505	4	16	M33	36	61.70
	419														57.90
(450)	457	670	42	600	110	500	8.8	12	20	550	4	20	M33	36	71.90
500	508	730	44	660	125	558	10	12	20	615	4	20	M33	36	89.60
600	610	845	46	770	125	660	11	12	20	720	5	20	M36	39	104.00
700	711	960	46	875	125	760	13	20	24	820	5	24	M39	42	136.00
800	813	1085	50	990	135	865	14	22	24	930	5	24	M45	48	186.00
900	914	1185	54	1090	145	968	16	24	28	1030	5	28	M45	48	236.00
1000	1016	1320	58	1210	155	1070	18	24	28	1140	5	28	M52	56	307.00
Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.															
Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.															

1.5.6. Flanse cu gat conform DIN 2635 PN 40
Welding Neck Flanges According to DIN 2635 NP 40



tabel A 1.5.6. table A 1.5.6.

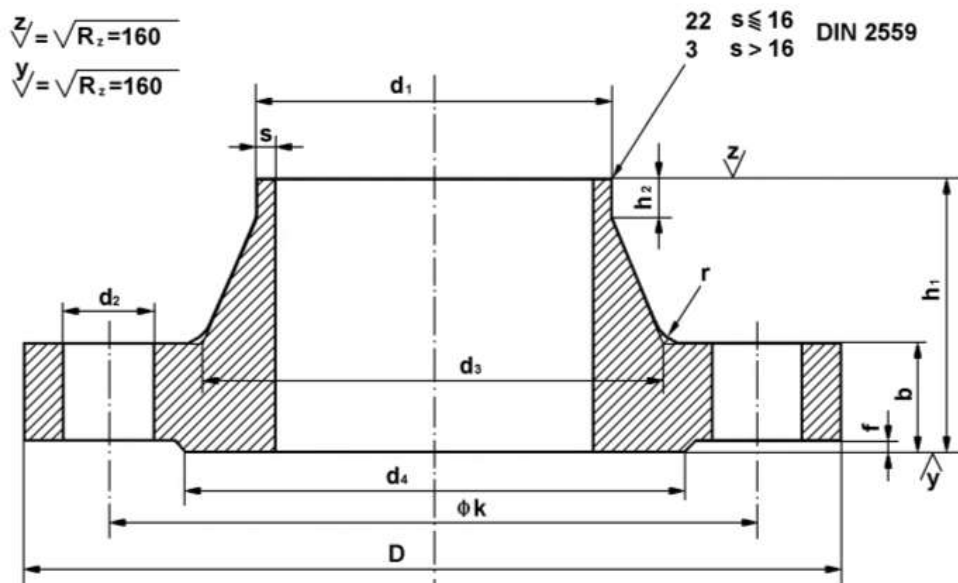
Teava		Dimensiunile flansei				Gat				Etansare		Suruburi		Masa (kg)	
Pipe		Flange Dimensions				Neck				Raised		Screws		Weight (kg)	
DN mm	d1 mm	D mm	b mm	k mm	h1 mm	d3 mm	s mm	r mm	h2 mm	d4 mm	f mm	n	Filet Thread	d2 mm	(7.85Kg/dm3)
ND mm															
10	14	90	16	60	35	25	1.8	4	6	40	2	4	M12	14	0.661
	17.2					28									
15	20	95	16	65	38	30	2	4	6	45	2	4	M12	14	0.746
						21.3									
20	25	105	18	75	40	38	2.3	4	6	58	2	4	M12	14	1.06
						26.9									
25	30	115	18	85	40	42	2.6	4	6	68	2	4	M12	14	1.29
						33.7									
32	38	140	18	100	42	52	2.6	6	6	78	2	4	M16	18	1.88
						42.4									
40	44.5	150	18	110	45	60	2.6	6	7	88	3	4	M16	18	2.33
						48.3									
50	57	165	20	125	48	72	2.9	6	8	102	3	4	M16	18	2.82
						60.3									
65	76.1	185	22	145	52	90	2.9	6	10	122	3	8	M16	18	3.74
80	88,9	200	24	160	58	105	3.2	8	12	138	3	8	M16	18	4.75
100	108	235	24	190	65	128	3.6	8	12	162	3	8	M20	22	6.52
						114.3									
125	133	270	26	220	68	155	4	8	12	188	3	8	M24	26	9.07
						139.7									
150	159	300	28	250	75	182	4.5	10	12	218	3	8	M24	26	11.80
						168.3									
(175)	193.7	350	32	295	82	218	5.6	10	15	260	3	12	M27	30	18.20
200	219.1	375	34	320	88	244	6.3	10	16	285	3	12	M27	30	21.50
250	267	450	38	385	105	298	7.1	12	18	345	3	12	M30	33	34.90
						273									
300	323.9	515	42	450	115	362	8	12	18	410	4	16	M30	33	49.70
350	355.6	580	46	510	125	408	8.8	12	20	465	4	16	M33	36	68.10
400	406.4	660	50	585	135	462	11	12	20	535	4	16	M36	39	96.50

tabel A 1.5.6. (continuare) table A 1.5.6. (continued)

Teava		Dimensiunile flansei				Gat				Etansare		Suruburi		Masa (kg)	
Pipe		Flange Dimensions				Neck				Raised		Screws		Weight (kg)	
DN mm	d1 mm	D mm	b mm	k mm	h1 mm	d3 mm	s mm	r mm	h2 mm	d4 mm	f mm	n	Filet Thread	d2 mm	(7.85Kg/dm3)
ND mm															
(450)	457	685	50	610	135	500	12.5	12	20	560	4	20	M36	39	99.70
500	508	755	52	670	140	562	14.2	12	20	615	4	20	M39	42	117.00

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.
Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

1.5.7. Flanse cu gat conform DIN 2636 PN 64 Welding Neck Flanges According to DIN 2636 NP 64

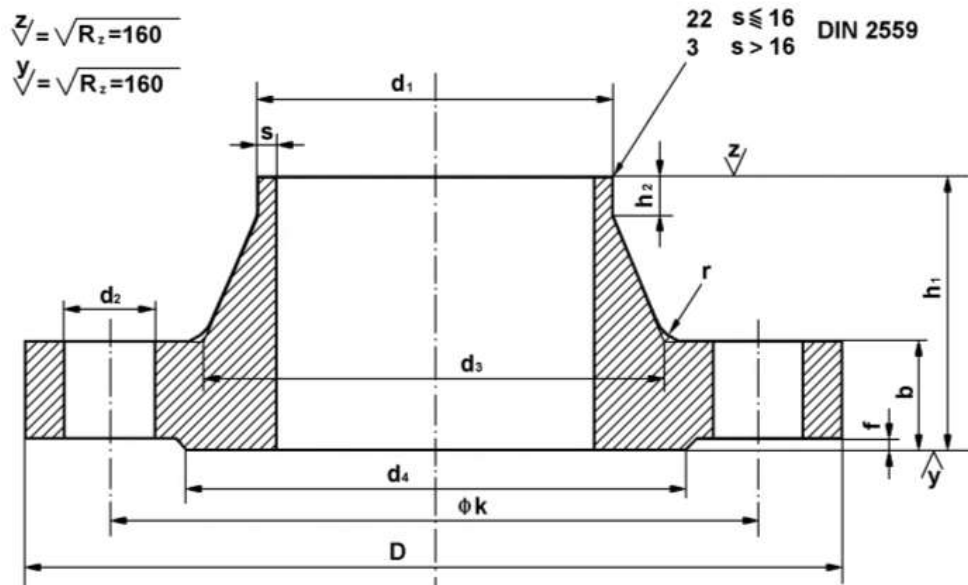


tabel A 1.5.7. table A1.5.7.

Teava		Dimensiunile flansei				Gat				Etansare		Suruburi		Masa (kg)	
Pipe		Flange Dimensions				Neck				Raised		Screws		Weight (kg)	
DN mm	d1 mm	D mm	b mm	k mm	h1 mm	d3 mm	s mm	r mm	h2 mm	d4 mm	f mm	n	Filet Thread	d2 mm	(7.85Kg/dm3)
ND mm															
Pentru diametre nominale intre 10-40mm vezi DIN 2637 PN 100 For nominal diametres 10-40mm see DIN 2637 NP 100															
50	57 60.3	180	26	135	62	78 82	2.9	6	10	102	3	4	M20	22	4.55
65	76.1	205	26	160	68	98	3.2	6	12	122	3	8	M20	22	5.73
80	88.9	215	28	170	72	112	3.6	8	12	138	3	8	M20	22	6.69
100	108 114.3	250	30	200	78	132 138	4	8	12	162	3	8	M24	26	9.66
125	133 139.7	295	34	240	88	162 168	4.5	8	12	188	3	8	M27	30	15.10
150	159 168.3	345	36	280	95	192 202	5.6	10	12	218	3	8	M30	33	21.90
(175)	193.7	375	40	310	105	228	6.3	10	16	260	3	12	M30	33	23.70
200	219.1	415	42	345	110	256	7.1	10	16	285	3	12	M33	36	34.90
250	267 273	470	46	400	125	310 316	8.8	12	18	345	3	12	M33	36	49.60
300	323.9	530	52	460	140	372	11	12	18	410	4	16	M33	36	68.70
350	355.6 368	600	56	525	150	420	12.5	12	20	465	4	16	M36	39	94.60
400	406.4 419	670	60	585	160	475	14.2	12	20	535	4	16	M39	42	124.00

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.
Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

1.5.8. Flanse cu gat conform DIN 2637 PN 100
Welding Neck Flanges According to DIN 2637 NP 100



tabel A 1.5.8. table A 1.5.8.

Teava		Dimensiunile flanseii				Gat				Etansare		Suruburi		Masa (kg)	
Pipe		Flange Dimensions				Neck				Raised		Screws		Weight (kg)	
DN mm	d1 mm	D mm	b mm	k mm	h1 mm	d3 mm	s mm	r mm	h2 mm	d4 mm	f mm	n	Filet Thread	d2 mm	(7.85Kg/dm ³)
ND mm															
10	14 17.2	100	20	70	45	28 32	1.8	4	6	40	2	4	M12	14	1.09
15	20 21.3	105	20	75	45	32 34	2	4	6	45	2	4	M12	14	1.19
25	30 33.7	140	24	100	58	48 52	2.6	4	8	68	2	4	M16	18	2.66
40	44.5 48.3	170	26	125	62	65 70	2.9	6	10	88	3	4	M20	22	4.09
50	57 60.3	195	28	145	68	86 90	3.2	6	10	102	3	4	M24	26	5.98
65	76.1	220	30	170	76	108	3.6	6	12	122	3	8	M24	26	7.91
80	88.9	230	32	180	78	120	4	8	12	138	3	8	M24	26	8.95
100	108 114.3	265	36	210	90	145 150	5	8	12	162	3	8	M27	30	13.70
125	133 139.7	315	40	250	105	180	6.3	8	12	188	3	8	M30	33	22.70
150	159 168.3	355	44	290	115	210	7.1	10	12	218	3	12	M30	33	30.20
(175)	193.7	385	48	320	127	245	8.8	10	16	260	3	12	M30	33	38.90
200	219.1	430	52	360	130	278	10	10	16	285	3	12	M33	36	52.80
250	267 273	505	60	430	157	340	12.5	12	18	345	3	12	M36	39	81.40
300	323.9	585	68	500	170	400	14.2	12	18	410	4	16	M39	42	122.00
350	355.6 368	655	74	560	189	460	16	12	20	465	4	16	M45	48	165.00

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

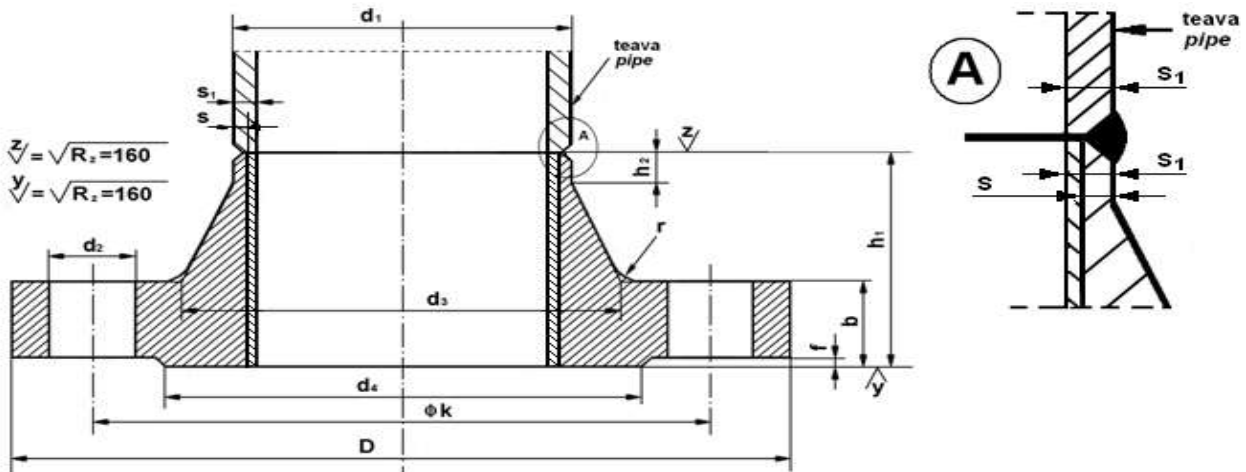
1.6. Flanse cu gat ingrosat Welding Neck Flanges With Thickened Neck

Flansele pentru sudura cu gat ingrosat deriva din flansele cu gat dupa seria DIN 2630-2637 si sunt o cerere frecventa a clientilor. Aceste flanse au gatul ingrosat pe partea interioara pentru a se realiza cat mai bine imbinarea sudata cu o teava ce are peretele mai gros decat cel luat in calcul de catre standardul de baza.

Masa acestor flanse se mareste cu masa cilindriului inelar care apare suplimentar.

Welding neck flanges with thickened neck derive from the welding neck flanges DIN 2630-2637 series and are a frequent request of customers. These flanges have a thickened neck on the inside to achieve a better welded fitting with a pipe whose wall is thicker than what was taken into account by the standard. The weight of these flanges is increased by the weight of the additional thickening cylinder.

Calculul masei flansei cu gat ingrosat Weight Calculation for Thickened Neck Flange



- m**: masa totala a flansei cu gat ingrosat (kg);
total weight of flange with thickened neck (kg);
- m₁**: masa cilindriului inelar suplimentar (kg);
the weight of the supplementary ring-shaped cylinder (kg);
- V₁**: volumul cilindriului inelar (mm³);
the volume of ring-shaped cylinder (mm³);
- ρ**: densitatea de calcul a otelului (7.85kg/dm³ = 7.85x10⁻⁶kg/mm³).
steel density (7.85kg/dm³ = 7.85x10⁻⁶kg/mm³).
- m = m_{dupa DIN(over DIN)} + m₁**
m₁ = ρV₁

$$V_1 = \pi h_1 \left[\frac{(d_1 - 2s)^2}{4} - \frac{(d_1 - 2s_1)^2}{4} \right] = \pi h_1 [d_1 (s_1 - s) + s^2 - s_1^2]$$

$$m_1 = 7.85 \times 10^{-6} \pi h_1 [d_1 (s_1 - s) + s^2 - s_1^2]$$

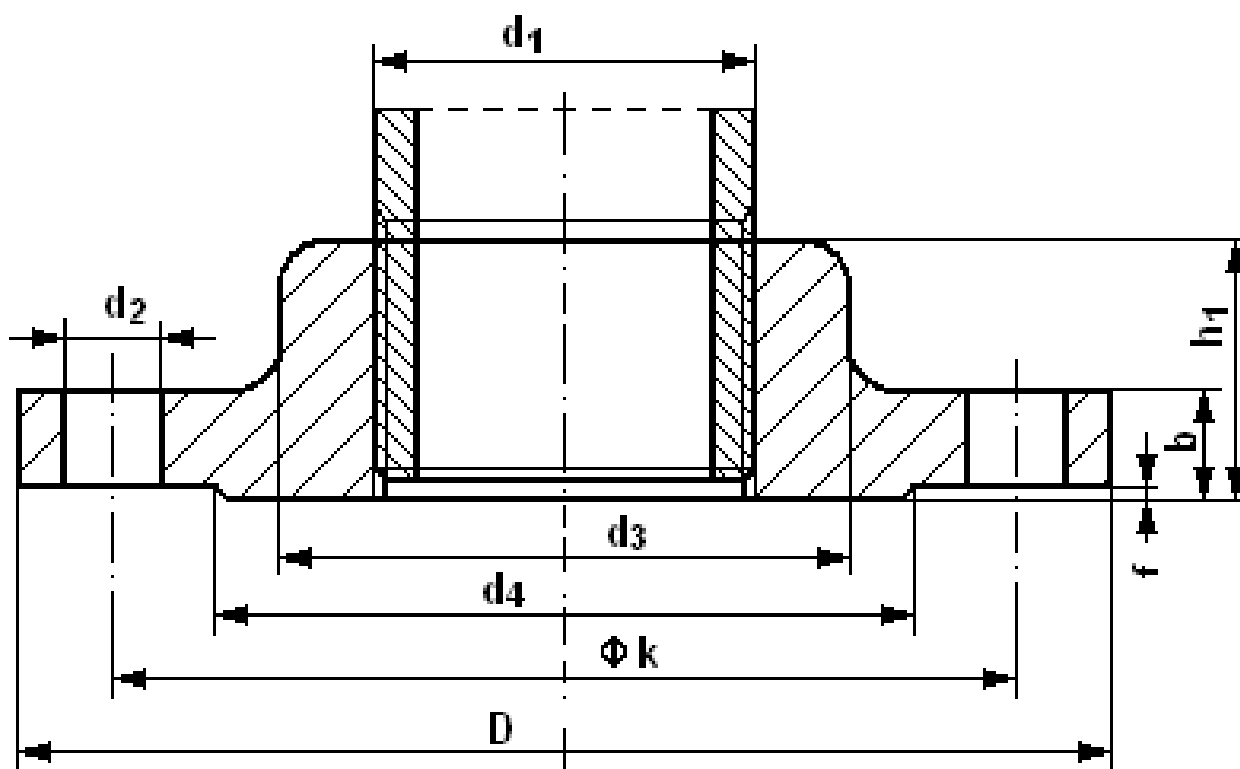
$$m = m_{\text{dupa DIN(over DIN)}} + 7.85 \times 10^{-6} \pi h_1 [d_1 (s_1 - s) + s^2 - s_1^2]$$

Calculul efectiv se face cu usurinta prin introducerea datelor intr-un sistem de calcul tabelar si pot fi puse oricand la dispozitia clientului. Un exemplu concret este cel ce urmeaza avand ca referinta DIN2633.

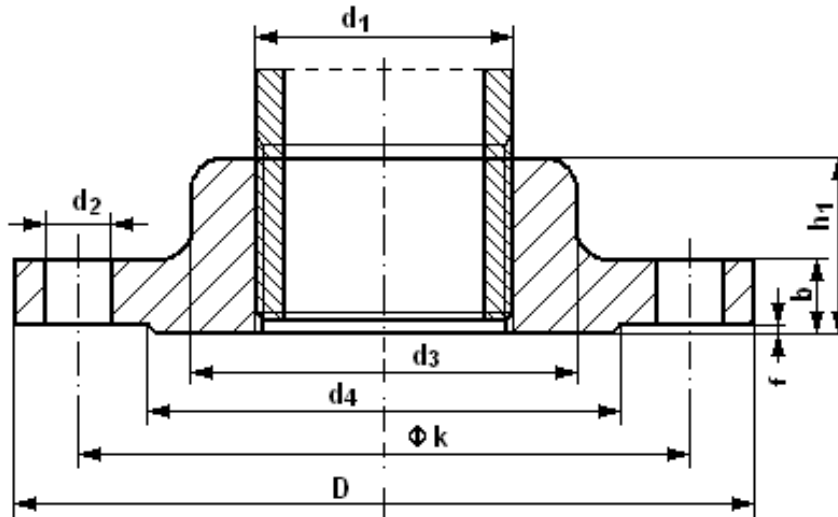
Actual calculation is easily made by entering data into a spreadsheet and can be made available to any customer. The following is a concrete example with the reference DIN2633.

DN mm	d ₁ mm	h ₁ mm	s mm	s ₁ mm	m _(dupa DIN2633) (kg)	m kg
ND mm					m _(over DIN2633) (kg)	
15	21.30	35.00	2.00	3.60	0.65	0.67
20	26.90	38.00	2.30	4.00	0.95	0.98
25	33.70	38.00	2.60	4.00	1.14	1.18
32	42.40	40.00	2.60	5.00	1.69	1.77
40	48.30	42.00	2.60	5.00	1.86	1.96
50	60.30	45.00	2.90	5.00	2.53	2.65
65	76.10	45.00	2.90	5.00	3.06	3.22
80	88.90	50.00	3.20	5.00	3.70	3.88
100	114.30	52.00	3.60	5.00	4.62	4.81
125	139.70	55.00	4.00	5.00	6.30	6.48
150	168.30	55.00	4.50	6.30	7.75	8.13
200	219.10	62.00	5.90	6.30	11.00	11.13

1.7. Flanse filetate cu gat conform standardelor germane (DIN)
Threaded Neck Flanges According to German Standards (DIN)



1.7.1. Flanse filetate cu gat conform DIN 2565 PN6
Threaded Neck Flanges According to DIN 2565 NP6



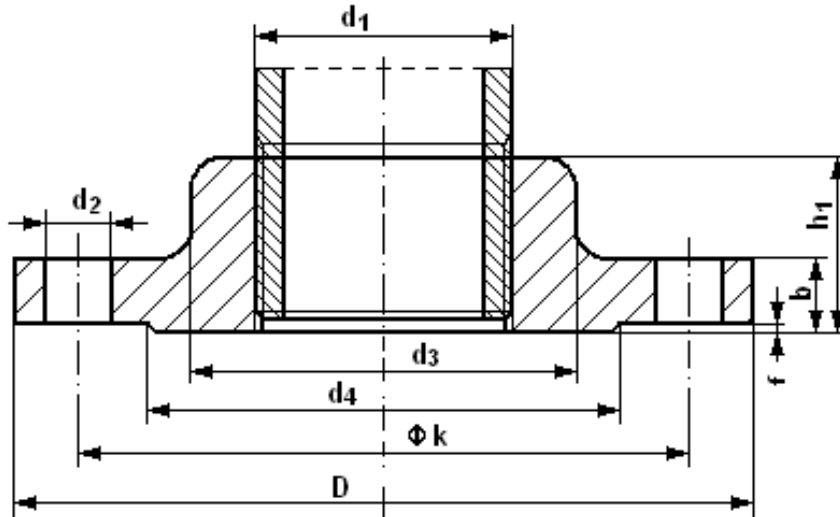
tabel A 1.7.1. table A 1.7.1.

Teava		Dimensiunile flansei					Filet	Etansare		Suruburi			Masa (kg)
Pipe		Flange Dimensions					Thread	Raised		Screws			Weight (kg)
DN mm	d1 mm	D mm	b mm	k mm	d3 mm	h1 mm	țoli (")	d4 mm	f mm	n	Filet Thread	d2 mm	(7.85Kg/dm3)
ND mm							inch (")						
6	10.2	65	10	40	18	18	R 1/8	25	2	4	M10	11	0.19
8	13.5	70	10	45	22	18	R 1/4	30	2	4	M10	11	0.227
10	17.2	75	12	50	25	20	R 3/8	35	2	4	M10	11	0.323
15	21.3	80	12	55	30	20	R 1/2	40	2	4	M10	11	0.373
20	26.9	90	14	65	40	24	R 3/4	50	2	4	M10	11	0.59
25	33.7	100	14	75	50	24	R 1	60	2	4	M10	11	0.743
32	42.4	120	14	90	60	26	R 1 1/4	70	2	4	M12	14	1.05
40	48.3	130	14	100	70	26	R 1 1/2	80	3	4	M12	14	1.20
50	60.3	140	14	110	80	28	R 2	90	3	4	M12	14	1.37
65	76.1	160	14	130	100	32	R 2 1/2	110	3	4	M12	14	1.92
80	88.9	190	16	150	110	34	R 3	128	3	4	M16	18	2.82
100	114.3	210	16	170	130	38	R 4	148	3	4	M16	18	3.19
125	139.7	240	18	200	160	40	R 5	178	3	8	M16	18	4.47
150	165.1	265	18	225	185	44	R 6	202	3	8	M16	18	5.30

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel ex not in stock can be delivered in about 10-15 days.

1.7.2. Flanse filetate cu gat conform DIN 2566 PN10 si PN16
Threaded Neck Flanges According to DIN 2566 NP10 and NP16



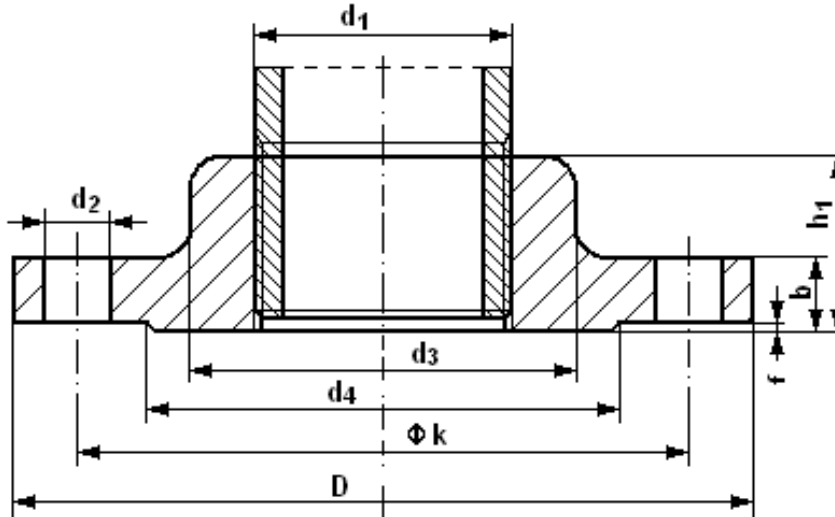
tabel A 1.7.2. table A 1.7.2.

Teava		Dimensiunile flansei					Filet	Etansare		Suruburi			Masa (kg)
Pipe		Flange Dimensions					Thread	Raised		Screws			Weight (kg)
DN mm	d1 mm	D mm	b mm	k mm	d3 mm	h1 mm	țoli (")	d4 mm	f mm	n	Filet	d2 mm	(7.85Kg/dm3)
ND mm	mm	mm	mm	mm	mm	mm	inch (")	mm	mm		Thread	mm	
6	10.2	75	12	50	20	18	R 1/8	32	2	4	M10	11	0.326
8	13.5	80	12	55	25	18	R 1/4	38	2	4	M10	11	0.380
10	17.2	90	14	60	30	20	R 3/8	40	2	4	M12	14	0.544
15	21.3	95	14	65	35	20	R 1/2	45	2	4	M12	14	0.613
20	26.9	105	16	75	45	24	R 3/4	58	2	4	M12	14	0.91
25	33.7	115	16	85	52	24	R 1	68	2	4	M12	14	1.10
32	42.4	140	16	100	60	26	R 1¼	78	2	4	M16	18	1.60
40	48.3	150	16	110	70	26	R 1½	88	3	4	M16	18	1.78
50	60.3	165	18	125	85	28	R 2	102	3	4	M16	18	2.43
65	76.1	185	18	145	105	32	R 2½	122	3	4	M16	18	3.18
80	88.9	200	20	160	118	34	R 3	138	3	8	M16	18	4.12
100	114.3	220	20	180	140	38	R 4	158	3	8	M16	18	4.47
125	139.7	250	22	210	168	40	R 5	188	3	8	M16	18	6.13
150	165.1	285	22	240	195	44	R 6	212	3	8	M20	22	7.92

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

1.7.3. Flanse filetate cu gat conform DIN 2567 PN25 si PN40
Threaded Neck Flanges According to DIN 2567 NP25 and NP40



tabel A 1.7.3. table A 1.7.3.

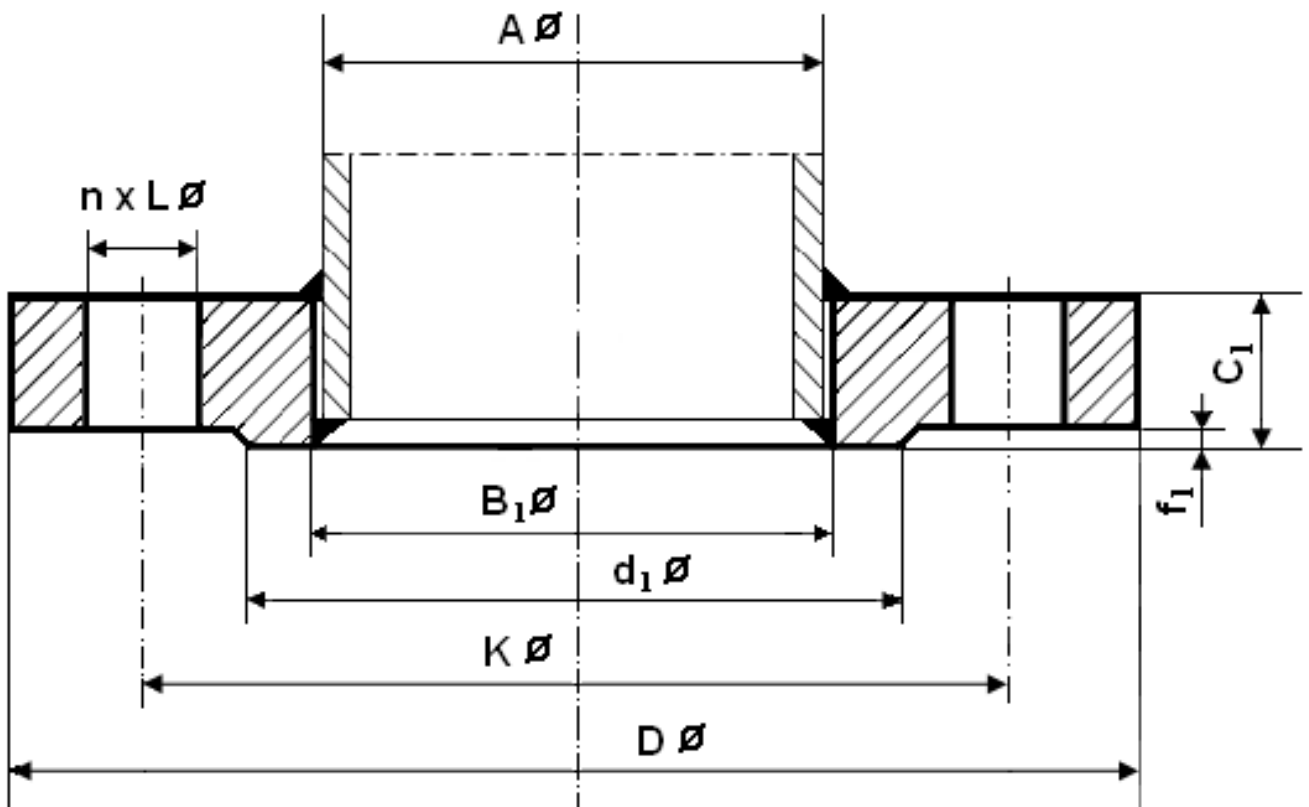
Teava		Dimensiunile flansei					Filet	Etansare		Suruburi			Masa (kg)
Pipe		Flange Dimensions					Thread	Raised		Screws			Weight (kg)
DN mm	d1 mm	D mm	b mm	k mm	d3 mm	h1 mm	foli (")	d4 mm	f mm	n	Filet	d2 mm	(7.85Kg/dm3)
ND mm	mm	mm	mm	mm	mm	mm	inch (")	mm	mm		Thread	mm	
6	10.2	75	14	50	20	20	R 1/8	32	2	4	M10	11	0.388
8	13.5	80	14	55	25	20	R 1/4	38	2	4	M10	11	0.45
10	17.2	90	16	60	30	22	R 3/8	40	2	4	M12	14	0.63
15	21.3	95	16	65	35	22	R 1/2	45	2	4	M12	14	0.71
20	26.9	105	18	75	45	26	R 3/4	58	2	4	M12	14	1.03
25	33.7	115	18	85	52	28	R 1	68	2	4	M12	14	1.28
32	42.4	140	18	100	60	30	R 1¼	78	2	4	M16	18	1.87
40	48.3	150	18	110	70	32	R 1½	88	3	4	M16	18	2.14
50	60.3	165	20	125	85	34	R 2	102	3	4	M16	18	2.85
65	76.1	185	22	145	105	38	R 2½	122	3	8	M16	18	3.85
80	88.9	200	24	160	118	40	R 3	138	3	8	M16	18	4.80
100	114.3	235	24	190	145	44	R 4	162	3	8	M20	22	6.43
125	139.7	270	26	220	170	48	R 5	188	3	8	M24	26	8.77
150	165.1	300	28	250	200	52	R 6	218	3	8	M24	26	10.50

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

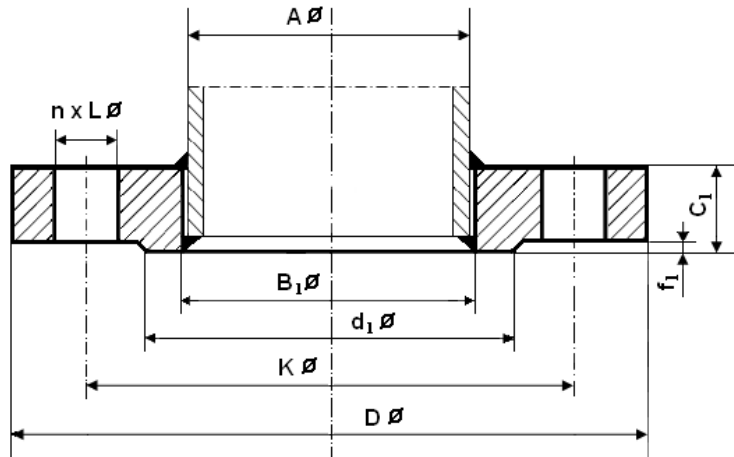
Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

2. FLANSE CONFORM STANDARDELOR EUROPENE (EN) *FLANGES ACCORDING TO EUROPEAN STANDARDS (EN)*

2.1. Flanse plate conform normelor europene (EN) *Flat Flanges According to European Norms (EN)*



2.1.1. Flanse plate tip 01 conform EN 1092-1 2001 PN 10
Flat Flanges Type 01 According to EN 1092-1 2001 NP 10



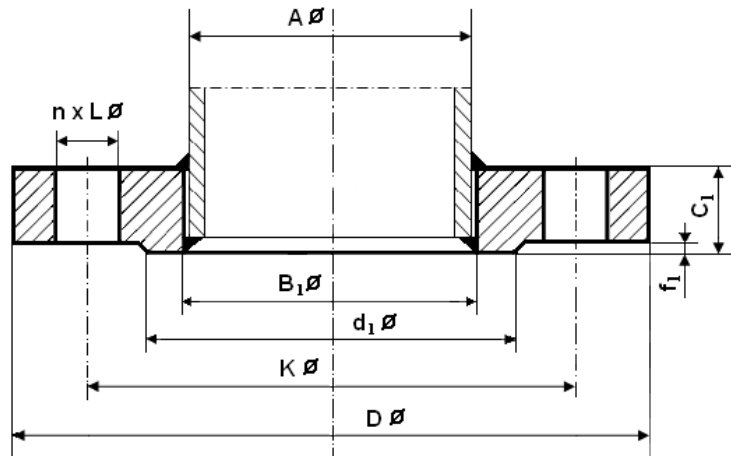
tabel A 2.1.1. table A 2.1.1.

Teava		Dimensiunile flansei				Etansare		Suruburi			Masa (kg)
Pipe		Flange Dimensions				Raised		Screws			Weight (kg)
DN mm	A mm	B1 mm	C1 mm	D mm	K mm	d1 mm	f1 mm	n	L mm	filet	(7.85Kg/dm3)
ND mm										thread	
<p style="color: blue; text-align: center;">Se observa ca pentru flansele cu diametrul nominal intre 10 si 40mm dimensiunile coincid cu EN 1092-1 PN 40 You may observe that for flanges with the nominal diameter 10 to 40mm the measurement are identical EN 1092-1 NP 40</p>											
10	17.2	18.0	14	90	60	40	2	4	14	M12	0.53
15	21.3	22.0	14	95	65	45	2	4	14	M12	0.59
20	26.9	27.5	16	105	75	58	2	4	14	M12	0.85
25	33.7	34.5	16	115	85	68	2	4	14	M12	1.02
32	42.4	43.5	18	140	100	78	2	4	18	M16	1.67
40	48.3	49.5	18	150	110	88	2	4	18	M16	1.92
<p style="color: blue; text-align: center;">Se observa ca pentru flansele cu diametrul nominal intre 50 si 150mm dimensiunile coincid cu EN 1092-1 PN 16 You may observe that for flanges with the nominal diameter 50 to 150 the measurement are identical EN 1092-1 NP 16</p>											
50	60.3	61.5	19	165	125	102	2	4	18	M16	2.41
65	76.1	77.5	20	185	145	122	2	8	18	M16	2.96
80	88.9	90.5	20	200	160	138	2	8	18	M16	3.38
100	114.3	116.0	22	220	180	158	2	8	18	M16	4.14
125	139.7	141.5	22	250	210	188	2	8	18	M16	5.11
150	168.3	170.5	24	285	240	212	2	8	22	M20	6.75
200	219.1	221.5	24	340	295	268	2	8	22	M20	8.79
250	273.0	276.5	26	395	350	320	2	12	22	M20	11.24
300	323.9	327.5	26	445	400	370	2	12	22	M20	12.95
350	355.6	359.5	28	505	460	430	2	16	22	M20	19.62
400	406.4	411.0	32	565	515	482	2	16	26	M24	26.59
450	457.0	462.0	36	615	565	532	2	20	26	M24	32.58
500	508.0	513.5	38	670	620	585	2	20	26	M24	39.09
600	610.0	616.5	42	780	725	685	2	20	30	M27	52.98
700	711.0	Vor fi stabilite impreuna cu clientul Shall be agreed with the purchaser		895	840	800	2	24	30	M27	
800	813.0			1015	950	905	2	24	33	M30	
900	914.0			1115	1050	1005	2	28	33	M30	
1000	1016.0			1230	1160	1110	2	28	36	M33	
1200	1219.0			1455	1380	1330	2	32	39	M36	
1400	1422.0			1675	1590	1535	2	36	42	M39	
1600	1626.0			1915	1820	1760	2	40	48	M45	
1800	1829.0			2115	2020	1960	2	44	48	M45	
2000	2032.0			2325	2230	2170	2	48	48	M45	

Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.

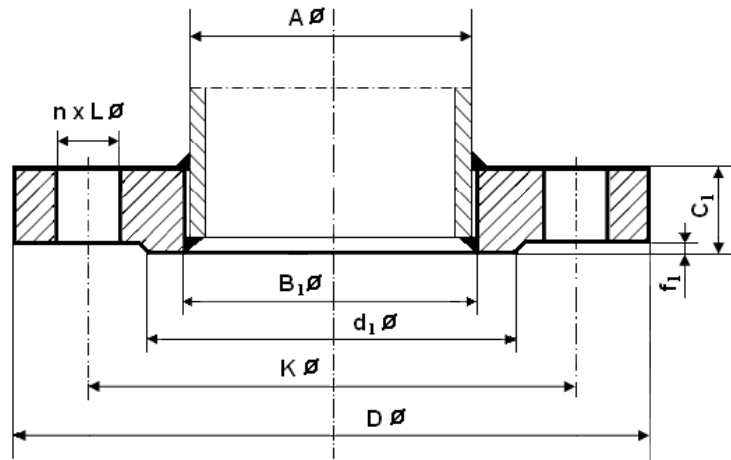
2.1.2. Flanse plate tip 01 conform EN 1092-1 2001 PN 16
Flat Flanges Type 01 According to EN 1092-1 2001 NP 16



tabel A 2.1.2. table A 2.1.2.

Teava		Dimensiunile flansei				Etansare		Suruburi			Masa (kg)
Pipe		Flange Dimensions				Raised		Screws			Weight (kg)
DN mm	A mm	B1 mm	C1 mm	D mm	K mm	d1 mm	f1 mm	n	L mm	filet thread	(7.85Kg/dm ³)
ND mm											
<p style="text-align: center;">Se observa ca pentru flansele cu diametrul nominal intre 10 si 40mm dimensiunile coincid cu EN 1092-1 PN 40 You may observe that for flanges with the nominal diameter 10 to 40 the measurement are identical EN 1092-1 PN 40</p>											
10	17.2	18.0	14	90	60	40	2	4	14	M12	0.53
15	21.3	22.0	14	95	65	45	2	4	14	M12	0.59
20	26.9	27.5	16	105	75	58	2	4	14	M12	0.85
25	33.7	34.5	16	115	85	68	2	4	14	M12	1.02
32	42.4	43.5	18	140	100	78	2	4	18	M16	1.67
40	48.3	49.5	18	150	110	88	2	4	18	M16	1.92
50	60.3	61.5	19	165	125	102	2	4	18	M16	2.41
65	76.1	77.5	20	185	145	122	2	8	18	M16	2.96
80	88.9	90.5	20	200	160	138	2	8	18	M16	3.38
100	114.3	116.0	22	220	180	158	2	8	18	M16	4.14
125	139.7	141.5	22	250	210	188	2	8	18	M16	5.11
150	168.3	170.5	24	285	240	212	2	8	22	M20	6.75
200	219.1	221.5	26	340	295	268	2	12	22	M20	9.28
250	273.0	276.5	29	405	355	320	2	12	26	M24	13.56
300	323.9	327.5	32	460	410	378	2	12	26	M24	18.25
350	355.6	359.5	35	520	470	438	2	16	26	M24	27.30
400	406.4	411.0	38	580	525	490	2	16	30	M27	34.86
450	457.0	462.0	42	640	585	550	2	20	30	M27	45.04
500	508.0	513.5	46	715	650	610	2	20	33	M30	62.58
600	610.0	616.5	52	840	770	725	2	20	36	M33	94.14
700	711.0			910	840	795	2	24	36	M33	
800	813.0			1025	950	900	2	24	39	M36	
900	914.0			1125	1050	1000	2	28	39	M36	
1000	1016.0			1255	1170	1115	2	28	42	M39	
1200	1219.0			1485	1390	1330	2	32	48	M45	
1400	1422.0			1685	1590	1530	2	36	48	M45	
1600	1626.0			1930	1820	1750	2	40	56	M52	
1800	1829.0			2130	2020	1950	2	44	56	M52	
2000	2032.0			2345	2230	2150	2	48	62	M56	
				<p>Vor fi stabilite impreuna cu clientul</p> <p>Shall be agreed with the purchaser</p>							
<p>Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.</p> <p>Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.</p>											

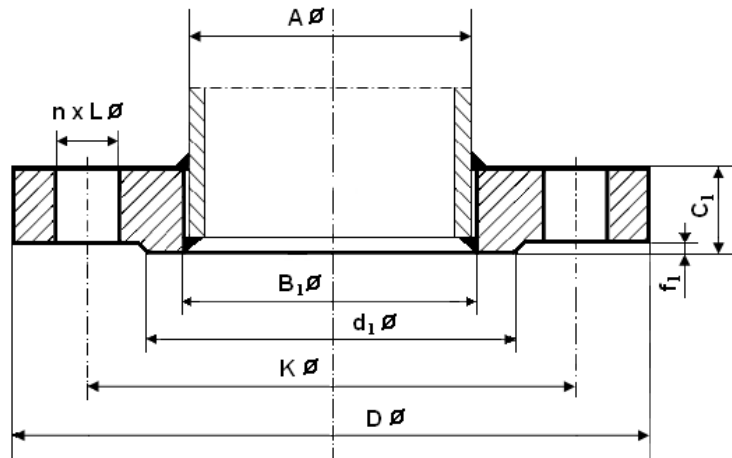
2.1.3. Flanse plate tip 01 conform EN 1092-1 2001 PN 25
Flat Flanges Type 01 According to EN 1092-1 2001 NP 25



tabel A 2.1.3. table A 2.1.3.

Teava		Dimensiunile flanse				Etansare		Suruburi			Masa (kg)
Pipe		Flange Dimensions				Raised		Screws			Weight (kg)
DN mm	A mm	B1 mm	C1 mm	D mm	K mm	d1 mm	f1 mm	n	L mm	filet thread	(7.85Kg/dm3)
ND mm											
Se observa ca pentru flansele cu diametrul nominal intre 10 si 150mm dimensiunile coincid cu EN 1092-1 PN 40 You may observe that for flanges with the nominal diameter 10 to 150mm the measurement are identical EN 1092-1 PN 40											
10	17.2	18.0	14	90	60	40	2	4	14	M12	0.53
15	21.3	22.0	14	95	65	45	2	4	14	M12	0.59
20	26.9	27.5	16	105	75	58	2	4	14	M12	0.85
25	33.7	34.5	16	115	85	68	2	4	14	M12	1.02
32	42.4	43.5	18	140	100	78	2	4	18	M16	1.67
40	48.3	49.5	18	150	110	88	2	4	18	M16	1.92
50	60.3	61.5	20	165	125	102	2	4	18	M16	2.54
65	76.1	77.5	22	185	145	122	2	8	18	M16	3.27
80	88.9	90.5	24	200	160	138	2	8	18	M16	4.10
100	114.3	116.0	26	235	190	162	2	8	22	M20	5.77
125	139.7	141.5	28	270	220	188	2	8	26	M24	7.80
150	168.3	170.5	30	300	250	218	2	8	26	M24	9.82
200	219.1	221.5	32	360	310	278	2	12	26	M24	13.75
250	273.0	276.5	35	425	370	335	2	12	30	M27	19.45
300	323.9	327.5	38	485	430	395	2	16	30	M27	25.81
350	355.6	359.5	42	555	490	450	2	16	33	M30	40.70
400	406.4	411	46	620	550	505	2	16	36	M33	53.89
450	457.0	462	50	670	600	555	2	20	36	M33	63.17
500	508.0	513.5	56	730	660	615	2	20	36	M33	82.40
600	610.0	616.5	68	845	770	720	2	20	39	M36	125.19
Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.											
Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.											

2.1.4. Flanse plate tip 01 conform EN 1092-1 2001 PN 40
Flat Flanges Type 01 According to EN 1092-1 2001 NP 40

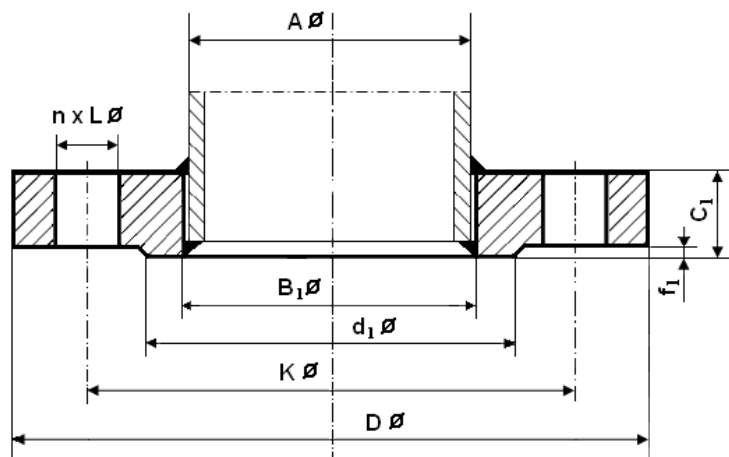


tabel A 2.1.4. table A 2.1.4.

Teava		Dimensiunile flansei				Etansare		Suruburi			Masa (kg)
Pipe		Flange Dimensions				Raised		Screws			Weight (kg)
DN mm	A mm	B1 mm	C1 mm	D mm	K mm	d1 mm	f1 mm	n	L mm	filet thread	(7.85Kg/dm3)
ND mm											
10	17.2	18.0	14	90	60	40	2	4	14	M12	0.53
15	21.3	22.0	14	95	65	45	2	4	14	M12	0.59
20	26.9	27.5	16	105	75	58	2	4	14	M12	0.85
25	33.7	34.5	16	115	85	68	2	4	14	M12	1.02
32	42.4	43.5	18	140	100	78	2	4	18	M16	1.67
40	48.3	49.5	18	150	110	88	2	4	18	M16	1.92
50	60.3	61.5	20	165	125	102	2	4	18	M16	2.54
65	76.1	77.5	22	185	145	122	2	8	18	M16	3.27
80	88.9	90.5	24	200	160	138	2	8	18	M16	4.10
100	114.3	116.0	26	235	190	162	2	8	22	M20	5.77
125	139.7	141.5	28	270	220	188	2	8	26	M24	7.80
150	168.3	170.5	30	300	250	218	2	8	26	M24	9.82
200	219.1	221.5	36	375	320	285	2	12	30	M27	17.33
250	273.0	276.5	42	450	385	345	2	12	33	M30	28.39
300	323.9	327.5	48	515	450	410	2	16	33	M30	40.61
350	355.6	359.5	54	580	510	465	2	16	36	M33	60.83
400	406.4	411.0	60	660	585	535	2	16	39	M36	88.09
450	457.0	462.0	66	685	610	560	2	20	39	M36	90.14
500	508.0	513.5	72	755	670	615	2	20	42	M39	118.37
600	610.0	616.5	84	890	795	735	2	20	48	M45	186.93

Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.
 Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.

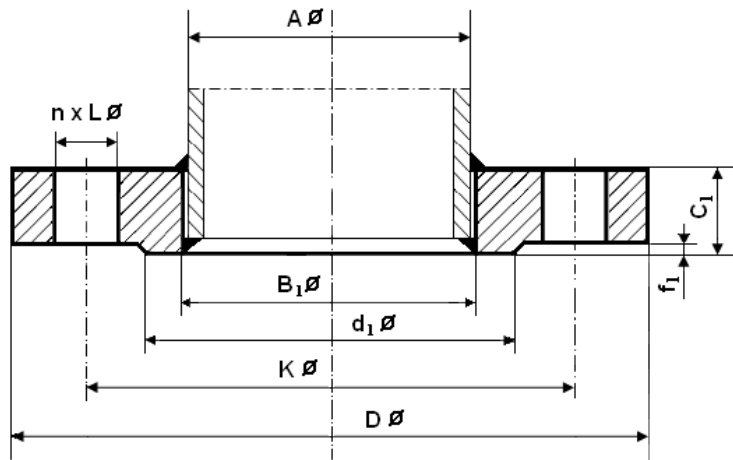
2.1.5. Flanse plate tip 01 conform EN 1092-1 2001 PN 63
Flat Flanges Type 01 According to EN 1092-1 2001 NP 63



tabel A 2.1.5. table A 2.1.5.

Teava		Dimensiunile flanseii				Etansare		Suruburi			Masa (kg)
Pipe		Flange Dimensions				Raised		Screws			Weight (kg)
DN mm	A mm	B1 mm	C1 mm	D mm	K mm	d1 mm	f1 mm	n	L mm	filet thread	(7.85Kg/dm3)
ND mm											
<p style="text-align: center;">Se observa ca pentru flansele cu diametrul nominal intre 10 si 40mm dimensiunile coincid cu EN 1092-1 PN 100 You may observe that for flanges with the nominal diameter 10 to 40mm the measurement are identical EN 1092-1 PN 100</p>											
10	17.2	18.0	20	100	70	40	2	4	14	M12	1.00
15	21.3	22.0	20	105	75	45	2	4	14	M12	1.10
20	26.9	27.5	22	130	90	58	2	4	18	M16	1.86
25	33.7	34.5	24	140	100	68	2	4	18	M16	2.37
32	42.4	43.5	24	155	110	78	2	4	22	M20	2.79
40	48.3	49.5	26	170	125	88	2	4	22	M20	3.70
50	60.3	61.5	26	180	135	102	2	4	22	M20	4.03
65	76.1	77.5	26	205	160	122	2	8	22	M20	4.87
80	88.9	90.5	30	215	170	138	2	8	22	M20	6.04
100	114.3	116.0	32	250	200	162	2	8	26	M24	8.23
125	139.7	141.5	34	295	240	188	2	8	30	M27	11.99
150	168.3	170.5	36	345	280	218	2	8	33	M30	17.26
200	219.1	221.5	46	415	345	285	2	12	36	M33	29.59
250	273.0	276.5	54	470	400	345	2	12	36	M33	41.84
300	323.9	327.5	62	530	460	410	2	16	36	M33	57.31
350	355.6	359.5	72	600	525	465	2	16	39	M36	90.14
400	406.4	411.0	78	670	585	535	2	16	42	M39	119.38
500	508.0	Vor fi stabilite impreuna cu clientul Shall be agreed with the purchaser		800	705	615	2	20	48	M45	
600	610.0			930	820	735	2	20	56	M52	
700	711.0			1045	935	840	2	24	56	M52	
800	813.0			1165	1050	960	2	24	62	M56	
900	914.0			1285	1170	1070	2	28	62	M56	
1000	1016.0			1415	1290	1180	2	28	70	M64	
1200	1219.0			1665	1530	1380	2	32	78	M72	
<p>Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.</p> <p><i>Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.</i></p>											

2.1.6. Flanse plate tip 01 conform EN 1092-1 2001 PN 100
Flat Flanges Type 01 According to EN 1092-1 2001 NP 100



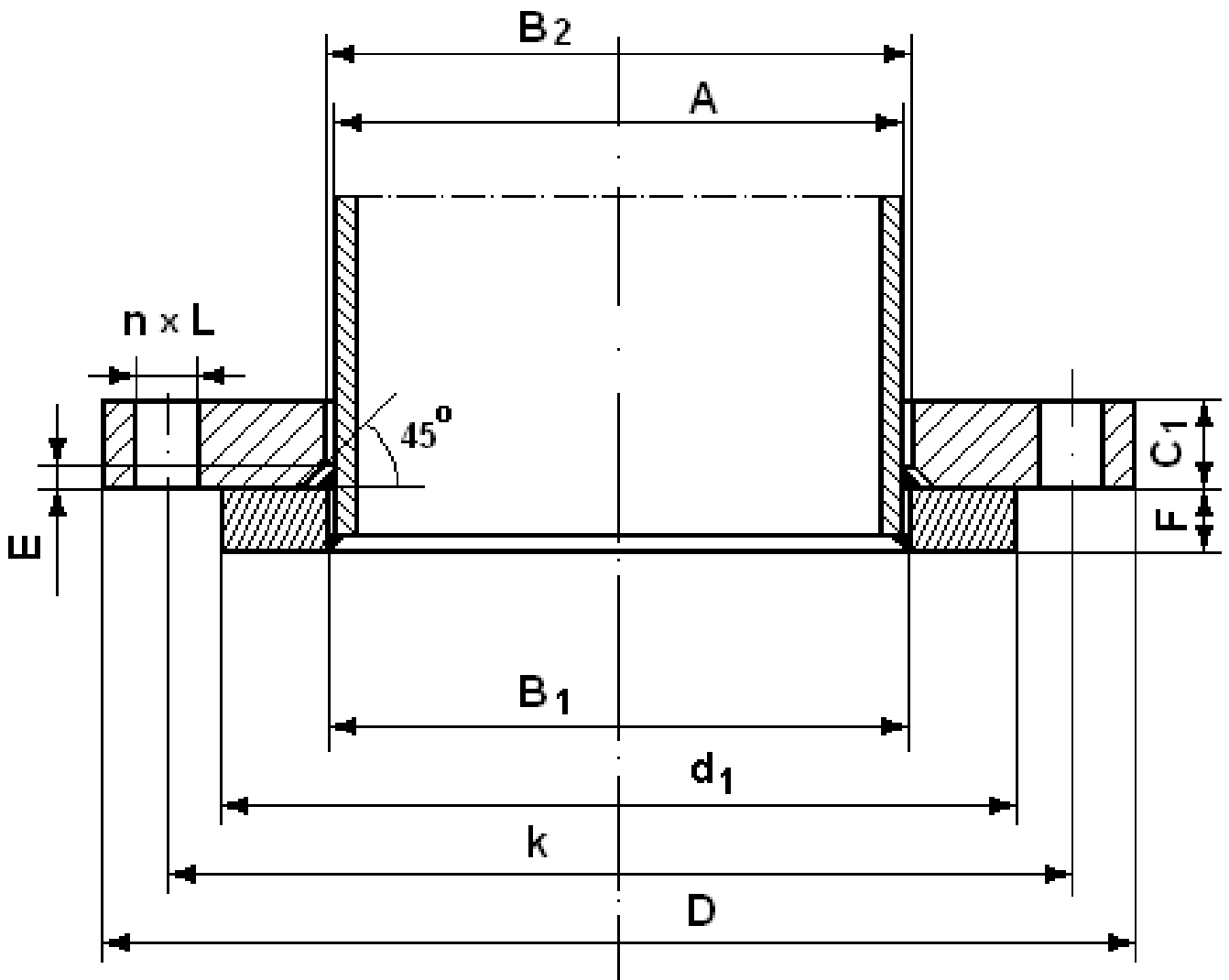
tabel A 2.1.6. table A 2.1.6.

Teava		Dimensiunile flansei				Etansare		Suruburi			Masa (kg)
Pipe		Flange Dimensions				Raised		Screws			Weight (kg)
DN mm	A mm	B1 mm	C1 mm	D mm	K mm	d1 mm	f1 mm	n	L mm	filet thread	(7.85Kg/dm3)
10	17.2	18.0	20	100	70	40	2	4	14	M12	
15	21.3	22.0	20	105	75	45	2	4	14	M12	1.10
20	26.9	27.5	22	130	90	58	2	4	18	M16	1.86
25	33.7	34.5	24	140	100	68	2	4	18	M16	2.37
32	42.4	43.5	24	155	110	78	2	4	22	M20	2.79
40	48.3	49.5	26	170	125	88	2	4	22	M20	3.70
50	60.3	61.5	28	195	145	102	2	4	26	M24	5.14
65	76.1	77.5	30	220	170	122	2	8	26	M24	6.50
80	88.9	90.5	34	230	180	138	2	8	26	M24	7.89
100	114.3	116.0	36	265	210	162	2	8	30	M27	10.55
125	139.7	141.5	42	315	250	188	2	8	33	M30	17.57
150	168.3	170.5	48	355	290	218	2	12	33	M30	24.02
200	219.1	221.5	60	430	360	285	2	12	36	M33	43.40
250	273.0	276.5	72	505	430	345	2	12	39	M36	69.70
300	323.9	327.5	84	585	500	410	2	16	42	M39	105.24
350	355.6	359.5	95	655	560	465	2	16	48	M45	151.77
400	406.4	411.0	106	715	620	535	2	16	48	M45	197.22
500	508.0	513.5	128	870	760	615	2	20	56	M52	335.70

Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

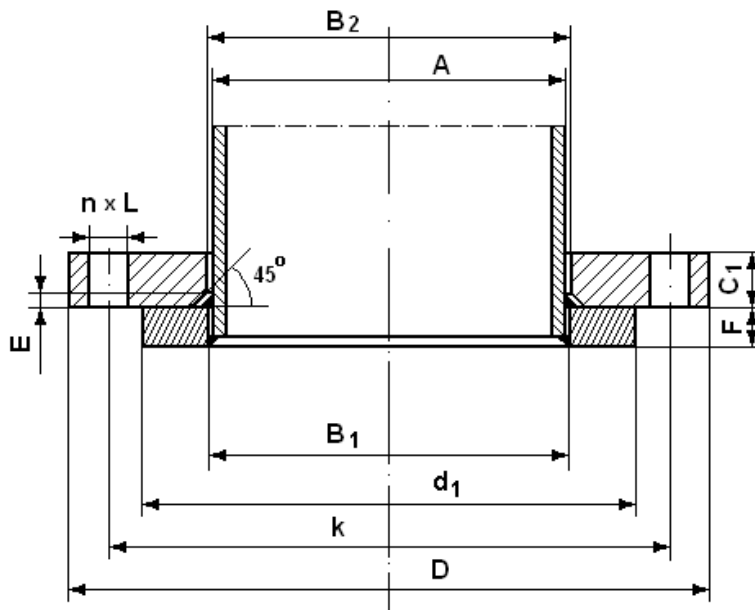
Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.

2.2. Flanse libere conform normelor europene (EN)
Lapped Flanges According to European Norms (EN)



2.2.1. Flanse libere tip 02 cu inel tip 32 conform EN 1092-1 PN 10

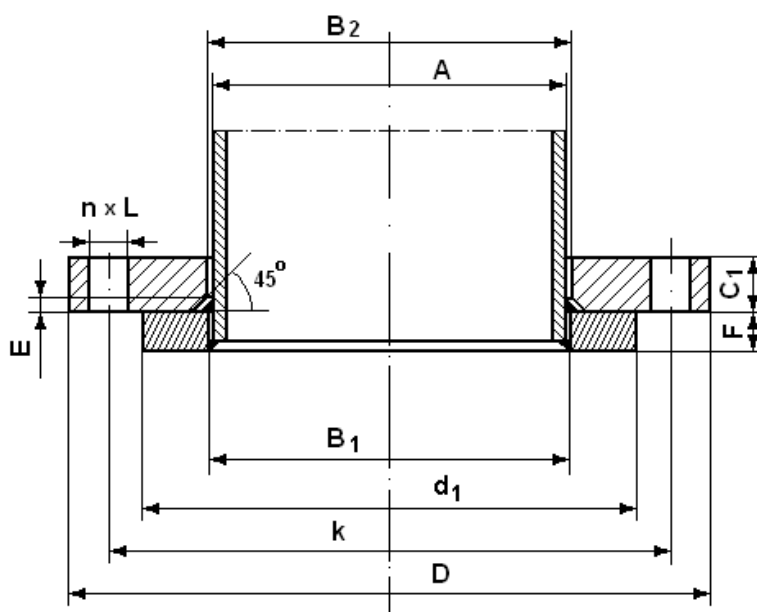
Lapped Flanges Type 02 With Collar Type 32 According to EN 1092-1 NP 10



tabel A 2.2.1. table A 2.2.1.

Teava		Dimensiunile flansei					Suruburi			Inel			Masa (kg) (7.85Kg/dm ³)	
Pipe		Flange Dimensions					Screws			Collar			Weight (kg) (7.85Kg/dm ³)	
DN mm	A mm	B2 mm	C1 mm	D mm	K mm	E mm	n	L mm	filet thread	d1 mm	B1 mm	F mm	Flansa Flange	Inel Collar
<p style="text-align: center;">Se observa ca pentru flansele cu diametrul nominal intre 10 si 40mm dimensiunile coincid cu EN 1092-1 PN 40 You may observe that for flanges with the nominal diameter 10 to 40mm the measurement are identical EN 1092-1 PN 40</p>														
10	17.2	21	14	90	60	3	4	14	M12	40	18	12	0.59	0.09
15	21.3	25	14	95	65	3	4	14	M12	45	22	12	0.65	0.11
20	26.9	31	16	105	75	4	4	14	M12	58	27.5	14	0.91	0.22
25	33.7	38	16	115	85	4	4	14	M12	68	34.5	14	1.08	0.30
32	42.4	46	18	140	100	5	4	18	M16	78	43.5	14	1.78	0.36
40	48.3	53	18	150	110	5	4	18	M16	88	49.5	14	2.02	0.46
<p style="text-align: center;">Se observa ca pentru flansele cu diametrul nominal intre 50 si 150mm dimensiunile coincid cu EN 1092-1 PN 16 You may observe that for flanges with the nominal diameter 50 to 150mm the measurement are identical EN 1092-1 PN 16</p>														
50	60.3	65	19	165	125	5	4	18	M16	102	61.5	16	2.52	0.65
65	76.1	81	20	185	145	6	8	18	M16	122	77.5	16	3.05	0.88
80	88.9	94	20	200	160	6	8	18	M16	138	90.5	16	3.48	1.07
100	114.3	120	22	220	180	6	8	18	M16	158	116	18	4.20	1.28
125	139.7	145	22	250	210	6	8	18	M16	188	141.5	18	5.21	1.70
150	168.3	174	24	285	240	6	8	22	M20	212	170.5	20	6.88	1.96
200	219.1	226	24	340	295	6	8	22	M20	268	221.5	20	8.87	2.81
250	273.0	281	26	395	350	8	12	22	M20	320	276.5	22	11.19	3.52
300	323.9	333	26	445	400	8	12	22	M20	370	327.5	22	12.76	4.02
350	355.6	365	28	505	460	8	16	22	M20	430	359.5	22	19.39	7.55
400	406.4	416	32	565	515	8	16	26	M24	482	411	24	26.36	9.38
450	457.0	467	36	615	565	8	20	26	M24	532	462	24	32.15	10.29
500	508.0	519	38	670	620	8	20	26	M24	585	513.5	26	38.46	12.58
600	610.0	622	42	780	725	8	20	30	M27	685	616.5	26	52.18	14.28
<p>Flansele din otel carbon, din inox sau din aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda. Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.</p>														

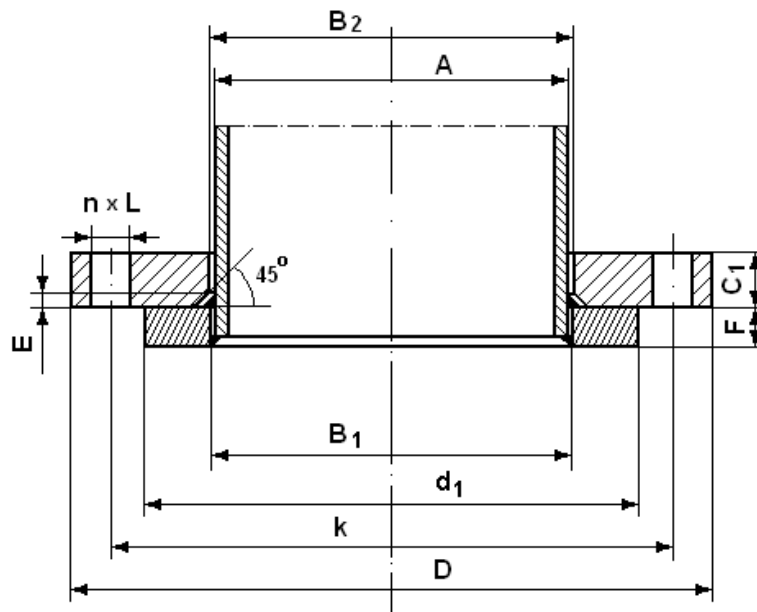
2.2.2. Flanse libere tip 02 cu inel tip 32 conform EN 1092-1 PN 16
Lapped Flanges Type 02 With Collar Type 32 According to EN 1092-1 NP 16



tabel A 2.2.2. table A 2.2.2.

Teava		Dimensiunile flansei					Suruburi			Inel			Masa (kg) (7.85Kg/dm ³)	
Pipe		Flange Dimensions					Screws			Collar			Weight (kg) (7.85Kg/dm ³)	
DN mm	A mm	B2 mm	C1 mm	D mm	K mm	E mm	n	L mm	filet thread	d1 mm	B1 mm	F mm	Flansa Flange	Inel Collar
<p style="text-align: center;">Se observa ca pentru flansele cu diametrul nominal intre 10 si 40mm dimensiunile coincid cu EN 1092-1 PN 40 You may observe that for flanges with the nominal diameter 10 to 40mm the measurement are identical EN 1092-1 PN 40</p>														
10	17.2	21	14	90	60	3	4	14	M12	40	18	12	0.59	0.09
15	21.3	25	14	95	65	3	4	14	M12	45	22	12	0.65	0.11
20	26.9	31	16	105	75	4	4	14	M12	58	27.5	14	0.91	0.22
25	33.7	38	16	115	85	4	4	14	M12	68	34.5	14	1.08	0.30
32	42.4	46	18	140	100	5	4	18	M16	78	43.5	14	1.78	0.36
40	48.3	53	18	150	110	5	4	18	M16	88	49.5	14	2.02	0.46
50	60.3	65	19	165	125	5	4	18	M16	102	61.5	16	2.52	0.65
65	76.1	81	20	185	145	6	8	18	M16	122	77.5	16	3.05	0.88
80	88.9	94	20	200	160	6	8	18	M16	138	90.5	16	3.48	1.07
100	114.3	120	22	220	180	6	8	18	M16	158	116	18	4.20	1.28
125	139.7	145	22	250	210	6	8	18	M16	188	141.5	18	5.21	1.70
150	168.3	174	24	285	240	6	8	22	M20	212	170.5	20	6.88	1.96
200	219.1	226	26	340	295	6	12	22	M20	268	221.5	20	9.31	2.81
250	273.0	281	29	405	355	8	12	26	M24	320	276.5	22	13.53	3.52
300	323.9	333	32	460	410	8	12	26	M24	378	327.5	24	17.99	5.27
350	355.6	365	35	520	470	8	16	26	M24	438	359.5	26	26.96	10.03
400	406.4	416	38	580	525	8	16	30	M27	490	411	28	34.55	12.28
450	457.0	467	42	640	585	8	20	30	M27	550	462	30	44.53	16.46
500	508.0	519	46	715	650	8	20	33	M30	610	513.5	32	61.97	21.38
600	610.0	622	52	840	770	8	20	36	M33	725	616.5	32	93.33	28.70
<p>Flansele din otel carbon, din inox sau din aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.</p> <p>Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.</p>														

2.2.3. Flanse libere tip 02 cu inel tip 32 conform EN 1092-1 PN 25
Lapped Flanges Type 02 With Collar Type 32 According to EN 1092-1 NP 25



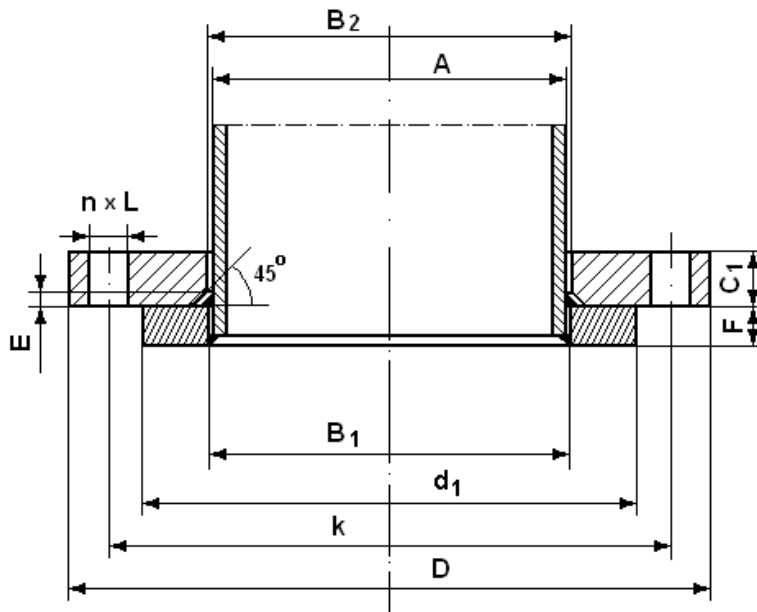
tabel A 2.2.3. table A 2.2.3.

Teava		Teava					Suruburi			Inel			Masa (kg) (7.85Kg/dm ³)	
Pipe		Pipe					Screws			Collar			Weight (kg) (7.85Kg/dm ³)	
DN mm	A mm	B2 mm	C1 mm	D mm	K mm	E mm	n	L mm	filet thread	d1 mm	B1 mm	F mm	Flansa Flange	Inel Collar
ND mm														
Se observa ca pentru flansele cu diametrul nominal intre 10 si 150mm dimensiunile coincid cu EN 1092-1 PN 40 You may observe that for flanges with the nominal diameter 10 to 150mm the measurement are identical EN 1092-1 PN 40														
10	17.2	21	14	90	60	3	4	14	M12	40	18	12	0.59	0.09
15	21.3	25	14	95	65	3	4	14	M12	45	22	12	0.65	0.11
20	26.9	31	16	105	75	4	4	14	M12	58	27.5	14	0.91	0.22
25	33.7	38	16	115	85	4	4	14	M12	68	34.5	14	1.08	0.30
32	42.4	46	18	140	100	5	4	18	M16	78	43.5	14	1.78	0.36
40	48.3	53	18	150	110	5	4	18	M16	88	49.5	14	2.02	0.46
50	60.3	65	20	165	125	5	4	18	M16	102	61.5	16	2.65	0.65
65	76.1	81	22	185	145	6	8	18	M16	122	77.5	16	3.36	0.88
80	88.9	94	24	200	160	6	8	18	M16	138	90.5	18	4.18	1.20
100	114.3	120	26	235	190	6	8	22	M20	162	116	20	5.87	1.58
125	139.7	145	28	270	220	6	8	26	M24	188	141.5	22	7.95	2.08
150	168.3	174	30	300	250	6	8	26	M24	218	170.5	24	9.96	2.73
200	219.1	226	32	360	310	6	12	26	M24	278	221.5	26	13.78	4.52
250	273.0	281	35	425	370	8	12	30	M27	335	276.5	26	19.37	5.73
300	323.9	333	38	485	430	8	16	30	M27	319	327.5	28	25.48	8.41
350	355.6	365	42	555	490	8	16	33	M30	450	359.5	32	40.44	14.45
400	406.4	416	46	620	550	8	16	36	M33	505	411	34	53.70	18.04
450	457.0	467	50	670	600	8	20	36	M33	555	462	36	62.76	20.98
500	508.0	519	56	730	660	8	20	36	M33	615	513.5	38	81.59	26.82
600	610.0	622	68	845	770	8	20	39	M36	720	616.5	40	123.84	34.10

Flansele din otel carbon, din inox sau din aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.
 Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.

2.2.4. Flanse libere tip 02 cu inel tip 32 conform EN 1092-1 PN 40

Lapped Flanges Type 02 With Collar Type 32 According to EN 1092-1 NP 40



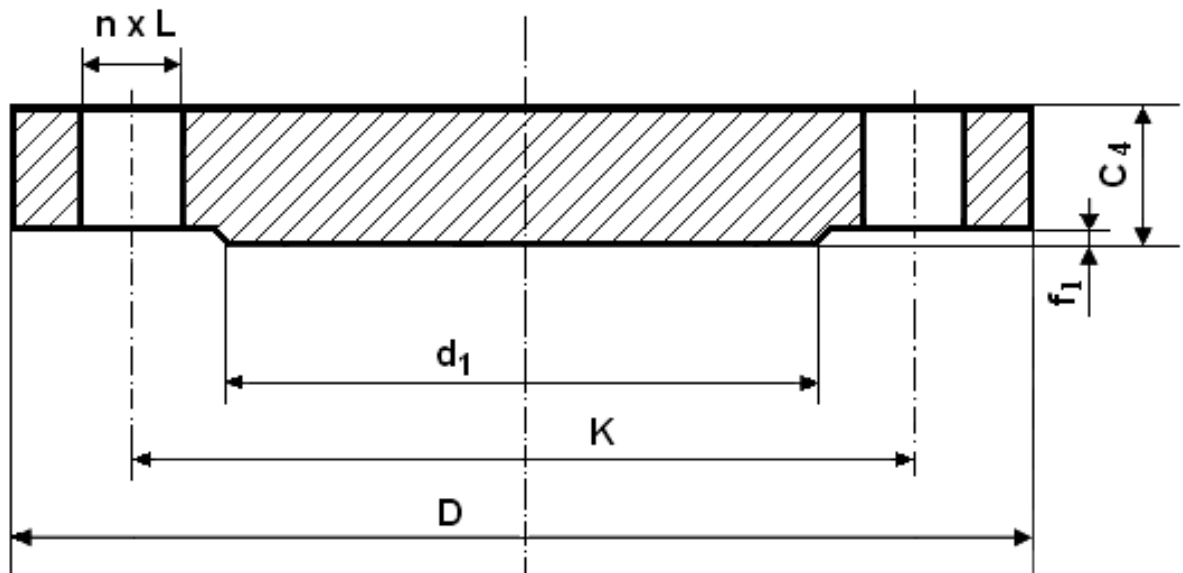
tabel A 2.2.4. table A 2.2.4.

Teava		Dimensiunile flansei					Suruburi			Inel			Masa (kg) (7.85Kg/dm ³)	
Pipe		Flange Dimensions					Screws			Collar			Weight (kg) (7.85Kg/dm ³)	
DN mm	A mm	B2 mm	C1 mm	D mm	K mm	E mm	n	L mm	filet thread	d1 mm	B1 mm	F mm	Flansa Flange	Inel Collar
10	17.2	21	14	90	60	3	4	14	M12	40	18	12	0.59	0.09
15	21.3	25	14	95	65	3	4	14	M12	45	22	12	0.65	0.11
20	26.9	31	16	105	75	4	4	14	M12	58	27.5	14	0.91	0.22
25	33.7	38	16	115	85	4	4	14	M12	68	34.5	14	1.08	0.30
32	42.4	46	18	140	100	5	4	18	M16	78	43.5	14	1.78	0.36
40	48.3	53	18	150	110	5	4	18	M16	88	49.5	14	2.02	0.46
50	60.3	65	20	165	125	5	4	18	M16	102	61.5	16	2.65	0.65
65	76.1	81	22	185	145	6	8	18	M16	122	77.5	16	3.36	0.88
80	88.9	94	24	200	160	6	8	18	M16	138	90.5	18	4.18	1.20
100	114.3	120	26	235	190	6	8	22	M20	162	116	20	5.87	1.58
125	139.7	145	28	270	220	6	8	26	M24	188	141.5	22	7.95	2.08
150	168.3	174	30	300	250	6	8	26	M24	218	170.5	24	9.96	2.73
200	219.1	226	36	375	320	6	12	30	M27	285	221.5	28	17.37	5.55
250	273.0	281	42	450	385	8	12	33	M30	345	276.5	30	28.37	7.87
300	323.9	333	48	515	450	8	16	33	M30	410	327.5	34	40.23	12.75
350	355.6	365	54	580	510	8	16	36	M33	465	359.5	36	60.42	19.30
400	406.4	416	60	660	585	8	16	39	M36	535	411	42	87.74	30.36
450	457.0	467	66	685	610	8	20	39	M36	560	462	46	89.39	28.39
500	508.0	519	72	755	670	8	20	42	M39	615	513.5	50	117.33	35.29
600	610.0	622	84	890	795	8	20	48	M45	735	616.5	54	185.40	53.29

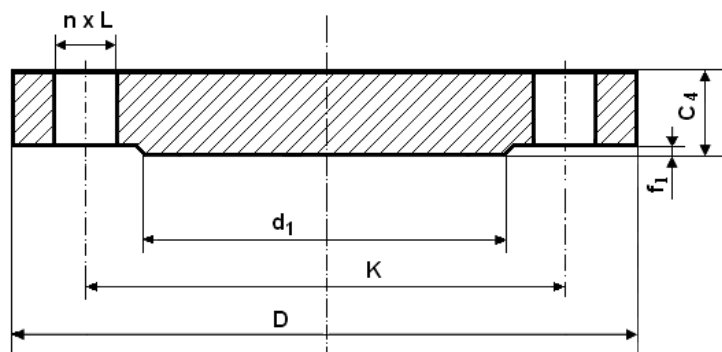
Flansele din otel carbon, din inox sau din aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.

2.3. Flanse oarbe conform normelor europene (EN)
Blind Flanges According to European Norms (EN)



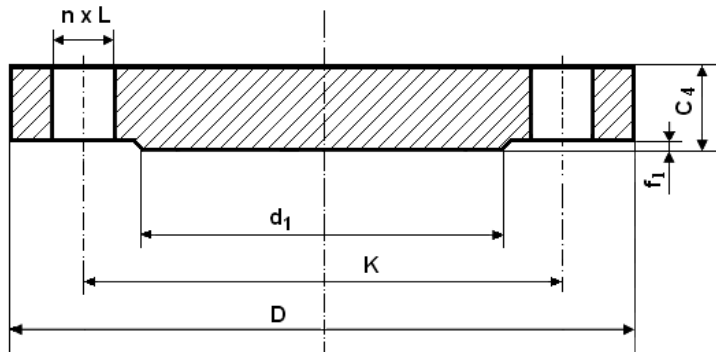
2.3.1. Flanse oarbe conform EN 1092-1 2001 Tip 05 PN 10
Blind Flanges According to EN 1092-1 2001 Type 05 NP 10



tabel A 2.3.1. table A 2.3.1.

DN mm	Dimensiunile flansei					Suruburi			Masa (Kg)	Material/Calitate		
	Flange Dimensions					Screws			Weight (Kg)	Material/Grades		
ND mm	D mm	C4 mm	K mm	d1 mm	f1 mm	n	filet	L mm	(7.85Kg/dm ³)	Otel	Otel Inox	
							thread			Carbon Steel	Stainless Steel	
										St 37-2 (S235-J2)	4301/4306 (304/304L)	4401/4404 (316/316L)
<p style="text-align: center;">Se observa ca pentru flansele cu diametrul nominal intre 10 si 40mm dimensiunile coincid cu EN 1092-1 PN 40 <i>You may observe that for flanges with the nominal diameter 10 to 40mm the measurement are identical EN 1092-1 PN 40</i></p>												
10	90	16	60	40	2	4	M12	14	0.65	x	x	x
15	95	16	65	45	2	4	M12	14	0.74	x	x	x
20	105	18	75	58	2	4	M12	14	1.05	x	x	x
25	115	18	85	68	2	4	M12	14	1.29	x	x	x
32	140	18	100	78	2	4	M16	18	1.88	x	x	x
40	150	18	110	88	2	4	M16	18	2.19	x	x	x
<p style="text-align: center;">Se observa ca pentru flansele cu diametrul nominal intre 50 si 150mm dimensiunile coincid cu EN 1092-1 PN 16 <i>You may observe that for flanges with the nominal diameter 50 to 150mm the measurement are identical EN 1092-1 PN 16</i></p>												
50	165	18	125	102	2	4	M16	18	2.69	x	x	x
65	185	18	145	122	2	8	M16	18	3.31	x	x	x
80	200	20	160	138	2	8	M16	18	4.39	x	x	x
100	220	20	180	158	2	8	M16	18	5.40	x	x	x
125	250	22	210	188	2	8	M16	18	7.83	x	x	x
150	285	22	240	212	2	8	M20	22	10.10	x	x	x
200	340	24	295	268	2	8	M20	22	16.05	x	x	x
250	395	26	350	320	2	12	M20	22	23.49	x	o	o
300	445	26	400	370	2	12	M20	22	30.13	x	o	o
350	505	26	460	430	2	16	M20	22	38.87	x	o	o
400	565	26	515	482	2	16	M24	26	48.50	x	o	o
450	615	28	565	532	2	20	M24	26	61.95	x	o	o
500	670	28	620	585	2	20	M24	26	74.00	x	o	o
600	780	34	725	685	2	20	M27	30	122.24	o	o	o
700	895	38	840	800	2	24	M27	30	180.84	o	o	o
800	1015	42	950	905	2	24	M30	33	257.64	o	o	o
900	1115	46	1050	1005	2	28	M30	33	341.32	o	o	o
1000	1230	52	1160	1110	2	28	M33	36	470.20	o	o	o
1200	1455	60	1380	1330	2	32	M36	39	761.12	o	o	o
<p>x – Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda. <i>x – Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.</i></p>												
<p>o - Se executa numai la comanda. <i>o - Produced only on order.</i></p>												

2.3.2. Flanse oarbe conform EN 1092-1 2001 Tip 05 PN 16
Blind Flanges According to EN 1092-1 2001 Type 05 NP 16

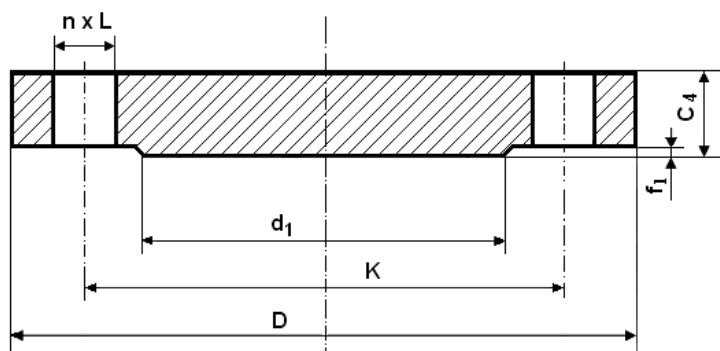


tabel A 2.3.2. table A 2.3.2.

DN Mm	Dimensiunile flansei					Suruburi			Masa (Kg)	Material/Calitate		
	Flange Dimensions					Screws			Weight (Kg)	Material/Grades		
ND Mm	D mm	C4 mm	K mm	d1 mm	f1 mm	n	filet	L mm	(7.85Kg/dm3)	Otel	Otel Inox	
							thread			Carbon Steel	Stainless Steel	
										St 37-2 (S235-J2)	4301/4306 (304/304L)	4401/4404 (316/316L)
<p>Se observa ca pentru flansele cu diametrul nominal intre 10 si 40mm dimensiunile coincid cu EN 1092-1 PN 40 You may observe that for flanges with the nominal diameter 10 to 40mm the measurement are identical EN 1092-1 PN 40</p>												
10	90	16	60	40	2	4	M12	14	0.65	x	x	x
15	95	16	65	45	2	4	M12	14	0.74	x	x	x
20	105	18	75	58	2	4	M12	14	1.05	x	x	x
25	115	18	85	68	2	4	M12	14	1.29	x	x	x
32	140	18	100	78	2	4	M16	18	1.88	x	x	x
40	150	18	110	88	2	4	M16	18	2.19	x	x	x
50	165	18	125	102	2	4	M16	18	2.69	x	x	x
65	185	18	145	122	2	8	M16	18	3.31	x	x	x
80	200	20	160	138	2	8	M16	18	4.39	x	x	x
100	220	20	180	158	2	8	M16	18	5.40	x	x	x
125	250	22	210	188	2	8	M16	18	7.83	x	x	x
150	285	22	240	212	2	8	M20	22	10.10	x	x	x
200	340	24	295	268	2	12	M20	22	15.78	x	x	x
250	405	26	355	320	2	12	M24	26	24.34	x	o	o
300	460	28	410	378	2	12	M24	26	34.38	x	o	o
350	520	30	470	438	2	16	M24	26	47.18	x	o	o
400	580	32	525	490	2	16	M27	30	62.51	x	o	o
450	640	40	585	550	2	20	M27	30	95.45	x	o	o
500	715	44	650	610	2	20	M30	33	131.29	x	o	o
600	840	54	770	725	2	20	M33	36	224.31	x	o	o
700	910	48	840	795	2	24	M33	36	233.75	o	o	o
800	1025	52	950	900	2	24	M36	39	322.49	o	o	o
900	1125	58	1050	1000	2	28	M36	39	434.43	o	o	o
1000	1255	64	1170	1115	2	28	M39	42	598.26	o	o	o
1200	1485	76	1390	1330	2	32	M45	48	993.84	o	o	o

x – Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.
 x – Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.
 o - Se executa numai la comanda.
 o - Produced only on order.

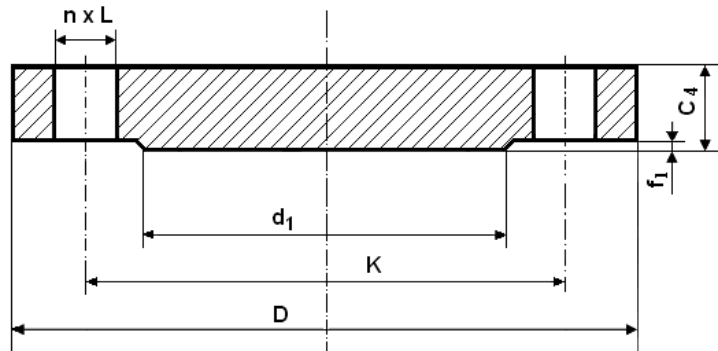
2.3.3. Flanse oarbe conform EN 1092-1 2001 Tip 05 PN 25
Blind Flanges According to EN 1092-1 2001 Type 05 NP 25



tabel A 2.3.3. table A 2.3.3.

DN mm	Dimensiunile flansei					Suruburi			Masa (Kg)	Material/Calitate		
	Flange Dimensions					Screws			Weight (Kg)	Material/Grades		
ND mm	D mm	C4 mm	K mm	d1 mm	f1 mm	n	filet	L mm	(7.85Kg/dm ³)	Otel	Otel Inox	
							thread			Carbon Steel	Stainless Steel	
										St 37-2 (S235-J2)	4301/4306 (304/304L)	4401/4404 (316/316L)
<p>Se observa ca pentru flansele cu diametrul nominal intre 10 si 150mm dimensiunile coincid cu EN 1092-1 PN 40 You may observe that for flanges with the nominal diameter 10 to 150mm the measurement are identical EN 1092-1 PN 40</p>												
10	90	16	60	40	2	4	M12	14	0.65	x	x	x
15	95	16	65	45	2	4	M12	14	0.74	x	x	x
20	105	18	75	58	2	4	M12	14	1.05	x	x	x
25	115	18	85	68	2	4	M12	14	1.29	x	x	x
32	140	18	100	78	2	4	M16	18	1.88	x	x	x
40	150	18	110	88	2	4	M16	18	2.19	x	x	x
50	165	20	125	102	2	4	M16	18	3.01	x	x	x
65	185	22	145	122	2	8	M16	18	4.09	x	x	x
80	200	24	160	138	2	8	M16	18	5.31	x	x	x
100	235	24	190	162	2	8	M20	22	7.29	x	x	x
125	270	26	220	188	2	8	M24	26	10.43	x	x	x
150	300	28	250	218	2	8	M24	26	14.15	x	x	x
200	360	30	310	278	2	12	M24	26	21.93	x	x	x
250	425	32	370	335	2	12	M27	30	32.79	x	o	o
300	485	34	430	395	2	16	M27	30	45.49	x	o	o
350	555	38	490	450	2	16	M30	33	66.99	x	o	o
400	620	40	550	505	2	16	M33	36	88.33	x	o	o
450	670	46	600	555	2	20	M33	36	118.51	x	o	o
500	730	48	660	615	2	20	M33	36	148.40	x	o	o
600	845	58	770	720	2	20	M36	39	242.33	x	o	o
<p>x – Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda. x – Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.</p>												
<p>o - Se executa numai cu comanda. o - Produced only on order.</p>												

2.3.4. Flanse oarbe conform EN 1092-1 2001 Tip 05 PN 40
Blind Flanges According to EN 1092-1 2001 Type 05 NP 40

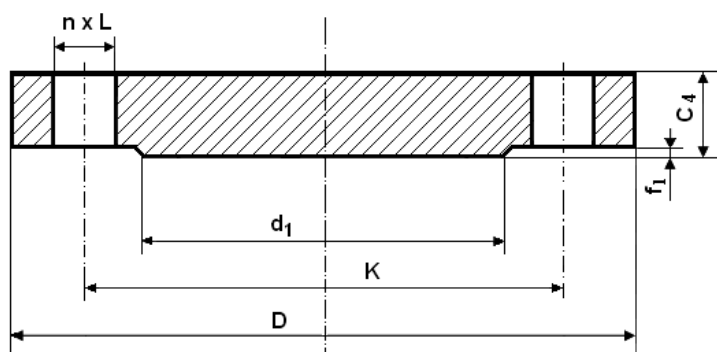


tabel A 2.3.4. table A 2.3.4.

DN mm	Dimensiunile flansei					Suruburi			Masa (Kg)	Material/Calitate		
	Flange Dimensions					Screws			Weight (Kg)	Material/Grades		
ND mm	D mm	C4 mm	K mm	d1 mm	f1 mm	n	fillet	L mm	(7,85Kg/dm ³)	Otel	Otel Inox	
							thread			Carbon Steel	Stainless Steel	
										St 37-2 (S235-J2)	4301/4306 (304/304L)	4401/4404 (316/316L)
10	90	16	60	40	2	4	M12	14	0.65	x	x	x
15	95	16	65	45	2	4	M12	14	0.74	x	x	x
20	105	18	75	58	2	4	M12	14	1.05	x	x	x
25	115	18	85	68	2	4	M12	14	1.29	x	x	x
32	140	18	100	78	2	4	M16	18	1.88	x	x	x
40	150	18	110	88	2	4	M16	18	2.19	x	x	x
50	165	20	125	102	2	4	M16	18	3.01	x	x	x
65	185	22	145	122	2	8	M16	18	4.09	x	x	x
80	200	24	160	138	2	8	M16	18	5.31	x	x	x
100	235	24	190	162	2	8	M20	22	7.29	x	x	x
125	270	26	220	188	2	8	M24	26	10.43	x	x	x
150	300	28	250	218	2	8	M24	26	14.15	x	x	x
200	375	36	320	285	2	12	M27	30	28.22	x	x	x
250	450	38	385	345	2	12	M30	33	43.51	x	o	o
300	515	42	450	410	2	16	M30	33	63.17	x	o	o
350	580	46	510	465	2	16	M33	36	88.28	x	o	o
400	660	50	585	535	2	16	M36	39	125.20	x	o	o
450	685	57	610	560	2	20	M36	39	152.61	x	o	o
500	755	57	670	615	2	20	M39	42	185.93	x	o	o
600	890	72	795	735	2	20	M45	48	328.50	x	o	o

x – Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.
x – Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.
o - Se executa numai la comanda.
o - Produced only on order.

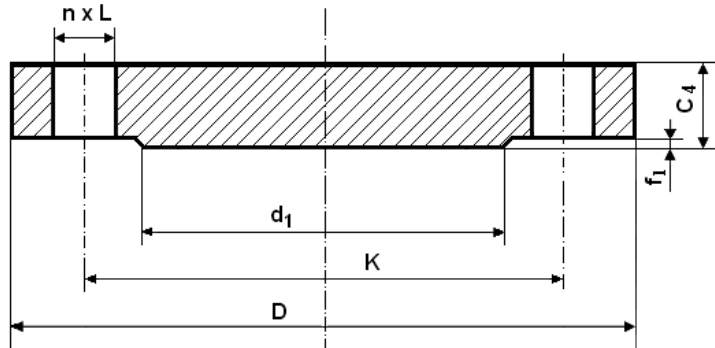
2.3.5. Flanse oarbe conform EN 1092-1 2001 Tip 05 PN 63
Blind Flanges According to EN 1092-1 2001 Type 05 NP 63



tabel A 2.3.5. table A 2.3.5.

DN mm	Dimensiunile flanseii					Suruburi			Masa (Kg)	Material/Calitate		
	Flange Dimensions					Screws			Weight (Kg)	Material/Grades		
ND mm	D mm	C4 mm	K mm	d1 mm	f1 mm	n	filet	L mm	(7,85Kg/dm ³)	Otel	Otel Inox	
							thread			Carbon Steel	Stainless Steel	
										St 37-2 (S235-J2)	4301/4306 (304/304L)	4401/4404 (316/316L)
<p style="text-align: center;">Se observa ca pentru flansele cu diametrul nominal intre 10 si 40mm dimensiunile coincid cu EN 1092-1 PN 100 You may observe that for flanges with the nominal diameter 10 to 40mm the measurement are identical EN 1092-1 PN 100</p>												
10	100	20	70	40	2	4	M12	14	1.04	x	x	x
15	105	20	75	45	2	4	M12	14	1.16	x	x	x
20	130	22	90	58	2	4	M16	18	1.97	x	x	x
25	140	24	100	68	2	4	M16	18	2.54	x	x	x
32	155	24	110	78	2	4	M20	22	3.07	x	x	x
40	170	26	125	88	2	4	M20	22	4.09	x	x	x
50	180	26	135	102	2	4	M20	22	4.64	x	x	x
65	205	26	160	122	2	8	M20	22	5.83	x	x	x
80	215	28	170	138	2	8	M20	22	7.03	x	x	x
100	250	30	200	162	2	8	M24	26	10.18	x	x	x
125	295	34	240	188	2	8	M27	30	16.19	x	x	x
150	345	36	280	218	2	8	M30	33	23.71	x	x	x
200	415	42	345	285	2	12	M33	36	39.63	x	x	x
250	470	46	400	345	2	12	M33	36	57.16	x	o	o
300	530	52	460	410	2	16	M33	36	82.25	x	o	o
350	600	56	525	465	2	16	M36	39	114.38	x	o	o
400	670	60	585	535	2	16	M39	42	153.91	x	o	o
<p>x – Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda. x – Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.</p>												
<p>o - Se executa numai cu comanda. o - Produced only on order.</p>												

2.3.6. Flanse oarbe conform EN 1092-1 2001 Tip 05 PN 100
Blind Flanges According to EN 1092-1 2001 Type 05 NP 100



tabel A 2.3.6. table A 2.3.6.

DN mm	Dimensiunile flansei					Suruburi			Masa (Kg)	Material/Calitate		
	Flange Dimensions					Screws			Weight (Kg)	Material/Grades		
ND mm	D mm	C4 mm	K mm	d1 mm	f1 mm	n	filet	L mm	(7.85Kg/dm ³)	Otel	Otel Inox	
							thread			Carbon Steel	Stainless Steel	
										St 37-2 (S235-J2)	4301/4306 (304/304L)	4401/4404 (316/316L)
10	100	20	70	40	2	4	M12	14	1.04	x	x	x
15	105	20	75	45	2	4	M12	14	1.16	x	x	x
20	130	22	90	58	2	4	M16	18	1.97	x	x	x
25	140	24	100	68	2	4	M16	18	2.54	x	x	x
32	155	24	110	78	2	4	M20	22	3.07	x	x	x
40	170	26	125	88	2	4	M20	22	4.09	x	x	x
50	195	28	145	102	2	4	M24	26	5.79	x	x	x
65	220	30	170	122	2	8	M24	26	7.61	x	x	x
80	230	32	180	138	2	8	M24	26	9.02	x	x	x
100	265	36	210	162	2	8	M27	30	13.54	x	x	x
125	315	40	250	188	2	8	M30	33	21.64	x	x	x
150	355	44	290	218	2	12	M30	33	29.83	x	x	x
200	430	52	360	285	2	12	M33	36	53.19	x	x	x
250	505	60	430	345	2	12	M36	39	86.11	x	o	o
300	585	68	500	410	2	16	M39	42	129.80	x	o	o
350	655	74	560	465	2	16	M45	48	176.68	x	o	o

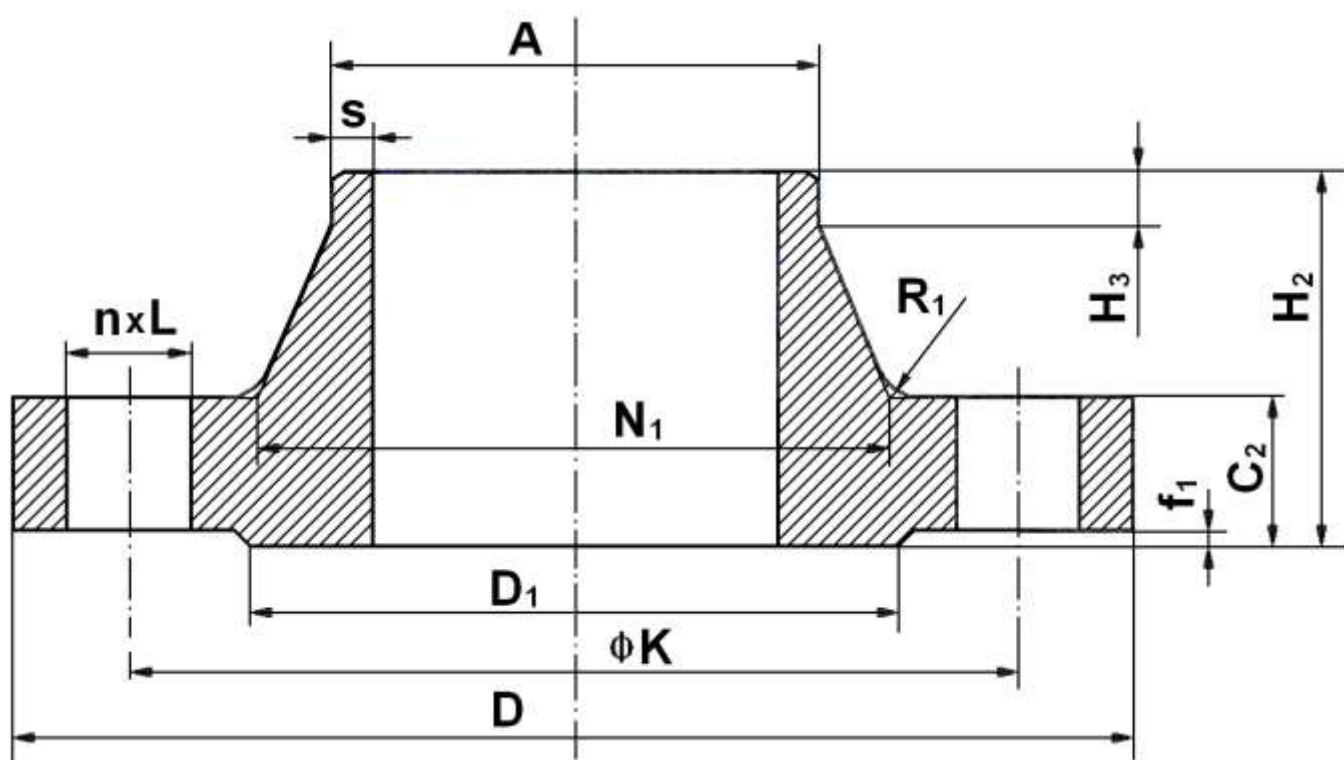
x – Flansele din otel carbon, din inox sau aluminiu care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

x – Flanges from carbon steel, stainless steel or aluminum not in stock can be delivered in about 10-15 days.

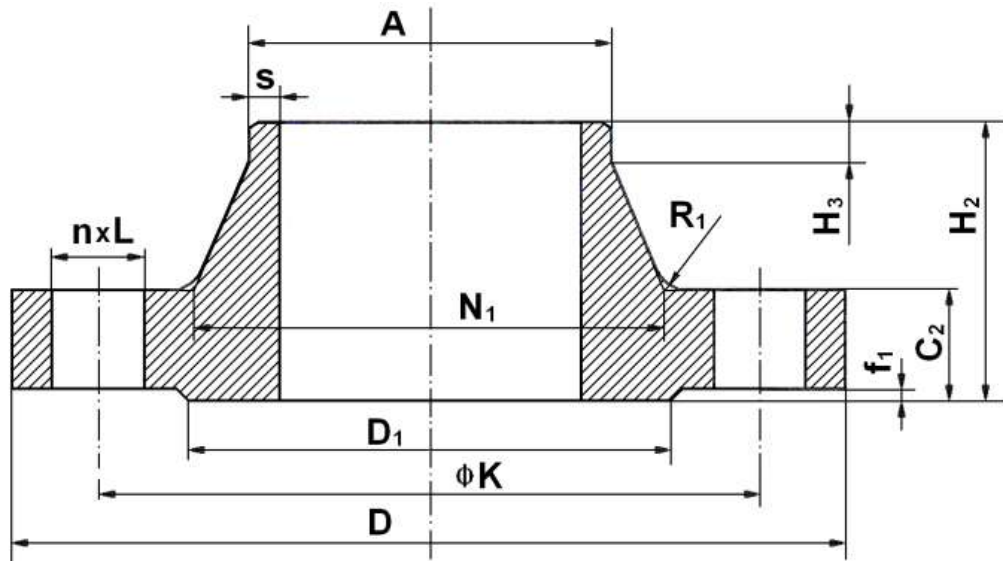
o - Se executa numai la comanda.

o - Produced only on order.

2.4. Flanse cu gat conform standardelor europene (EN)
Welding Neck Flanges According to European Norms (EN)



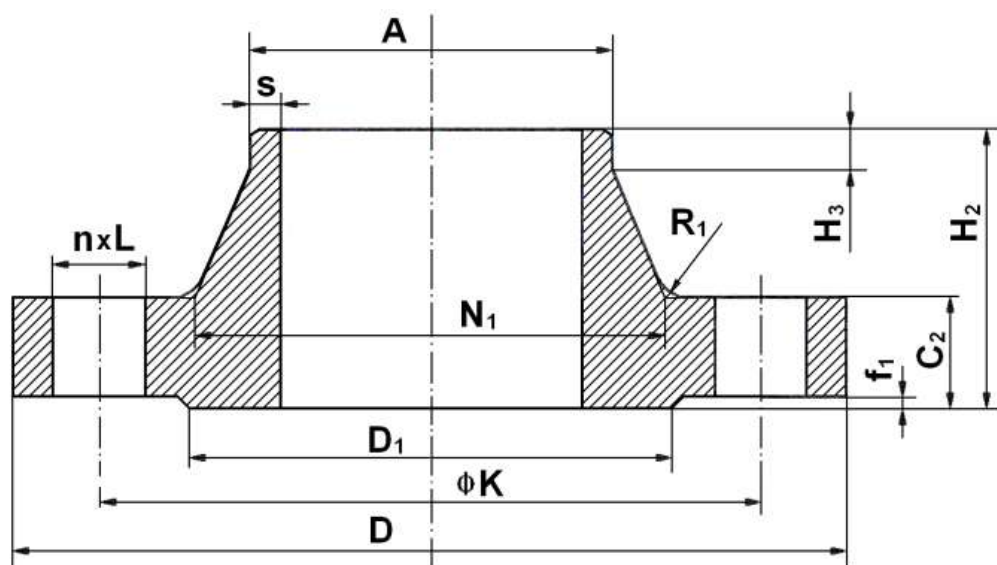
2.4.1. Flanse cu gat conform EN 1092-1 2001 Tip 11 PN 10
Welding Neck Flanges According to EN 1092-1 2001 Type 11 NP 10



tabel A 2.4.1. table A 2.4.1.

Teava		Dimensiunile flanseii										Suruburi		Masa (kg)	
Pipe		Flange Dimensions										Screws		(7.85Kg/dm ³)	
DN mm	A mm	D mm	K mm	H2 mm	C2 mm	N1 mm	H3 mm	R1 mm	s mm	D1 mm	f1 mm	n	L mm	filet thread	Weight (kg)
ND mm															(7.85Kg/dm ³)
Pentru flansele cu diametrul nominal intre 10 si 40mm dimensiunile coincid cu EN 1092-1 PN 40 For flanges with the nominal diameter 10 to 40mm the measurement are identical EN 1092-1 PN 40															
Pentru flansele cu diametrul nominal intre 50 si 150mm dimensiunile coincid cu EN 1092-1 PN 16 For flanges with the nominal diameter 50 to 150mm the measurement are identical EN 1092-1 PN 16															
200	219.1	340	295	62	24	234	16	10	6.3	268	2	8	22	M20	11.50
250	273.0	395	350	68	26	292	16	12	6.3	320	2	12	22	M20	15.50
300	323.9	445	400	68	26	342	16	12	7.1	370	2	12	22	M20	18.00
350	355.6	505	460	68	26	385	16	12	7.1	430	2	16	22	M20	24.50
400	406.4	565	515	72	26	440	16	12	7.1	482	2	16	26	M24	29.50
450	457.0	615	565	72	28	488	16	12	7.1	532	2	20	26	M24	34.00
500	508.0	670	620	75	28	542	16	12	7.1	585	2	20	26	M24	39.50
600	610.0	780	725	80	28	642	18	12	7.1	685	2	20	30	M27	56.00
700	711.0	895	840	80	30	746	18	12	8	800	2	24	30	M27	65.00
800	813.0	1015	950	90	32	850	18	12	8	905	2	24	33	M30	87.00
900	914.0	1115	1050	95	34	950	20	12	10	1005	2	28	33	M30	106.00
1000	1016.0	1230	1160	95	34	1052	20	16	10	1110	2	28	36	M33	123.00
1200	1219.0	1455	1380	115	38	1256	25	16	11	1330	2	32	39	M36	184.00
1400	1422.0	1675	1590	120	42	1460	25	16	12	1535	2	36	42	M39	252.00
1600	1626.0	1915	1820	130	46	1666	25	16	14	1760	2	40	48	M45	363.00
1800	1829.0	2115	2020	140	50	1868	30	16	15	1960	2	44	48	M45	445.50
2000	2032.0	2325	2230	150	54	2072	30	16	16	2170	2	48	48	M45	558.00
Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.															
Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.															

2.4.2. Flanse cu gat conform EN 1092-1 2001 Tip 11 PN 16
Welding Neck Flanges According to EN 1092-1 2001 Type 11 NP 16



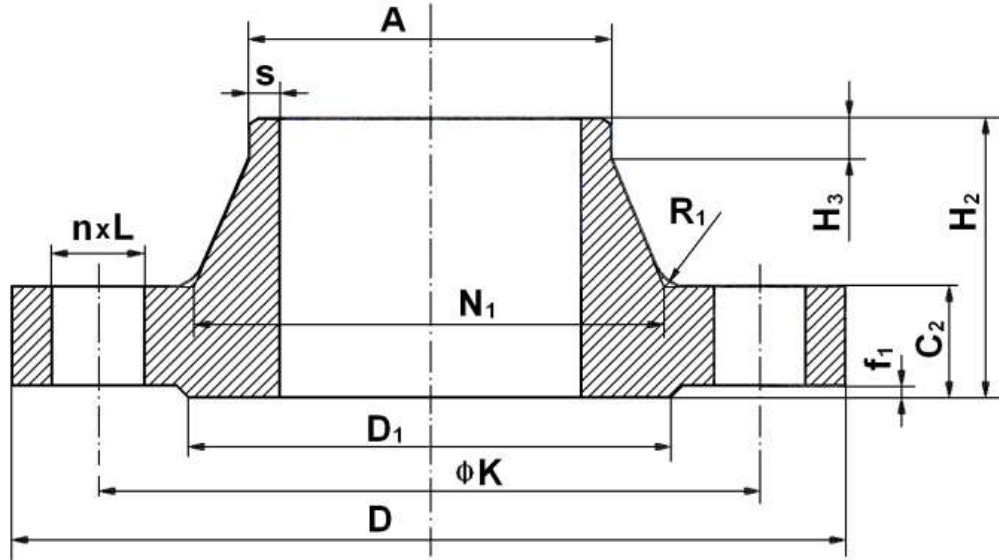
tabel A 2.4.2. table A 2.4.2.

Teava		Dimensiunile flansei										Suruburi		Masa (kg)		
Pipe		Flange Dimensions										Screws		(7.85Kg/dm ³)		
DN mm	A mm	D mm	K mm	H2 mm	C2 mm	N1 mm	H3 mm	R1 mm	s mm	D1 mm	f1 mm	n	L mm	filet thread	Weight (kg)	
ND mm																(7.85Kg/dm ³)
Pentru flansele cu diametrul nominal intre 10 si 40mm dimensiunile coincid cu EN 1092-1 PN 40 For flanges with the nominal diameter 10 to 40mm the measurement are identical EN 1092-1 PN 40																
50	60.3	165	125	45	18	74	8	5	2.9	102	2	4	18	M16	2.47	
65	76.1	185	145	45	18	92	10	6	2.9	122	2	8	18	M16	3.06	
80	88.9	200	160	50	20	105	10	6	3.2	138	2	8	18	M16	3.70	
100	114.3	220	180	52	20	131	12	8	3.6	158	2	8	18	M16	4.54	
125	139.7	250	210	55	22	156	12	8	4	188	2	8	18	M16	5.90	
150	168.3	285	240	55	22	184	12	10	4.5	212	2	8	22	M20	7.36	
200	219.1	340	295	62	24	235	16	10	6.3	268	2	12	22	M20	11.00	
250	273.0	405	355	70	26	292	16	12	6.3	320	2	12	26	M24	16.50	
300	323.9	460	410	78	28	344	16	12	7.1	378	2	12	26	M24	22.00	
350	355.6	520	470	82	30	390	16	12	8	438	2	16	26	M24	32.00	
400	406.4	580	525	85	32	445	16	12	8	490	2	16	30	M27	40.00	
450	457.0	640	585	87	40	490	16	12	8	550	2	20	30	M27	54.50	
500	508.0	715	650	90	44	548	16	12	8	610	2	20	33	M30	74.00	
600	610.0	840	770	95	54	652	18	12	8.8	725	2	20	36	M33	116.50	
700	711.0	910	840	100	36	755	18	12	8.8	795	2	24	36	M33	87.00	
800	813.0	1025	950	105	38	855	20	12	10	900	2	24	39	M36	111.00	
900	914.0	1125	1050	110	40	955	20	12	10	1000	2	28	39	M36	129.00	
1000	1016.0	1255	1170	120	42	1058	22	16	10	1115	2	28	42	M39	169.00	
1200	1219.0	1485	1390	130	48	1262	30	16	12.5	1330	2	32	48	M45	251.00	
1400	1422.0	1685	1590	145	52	1465	30	16	14.2	1530	2	36	48	M45	329.00	
1600	1626.0	1930	1820	160	58	1668	35	16	16	1750	2	40	56	M52	476.00	
1800	1829.0	2130	2020	170	62	1870	35	16	17.5	1950	2	44	56	M52	582.00	
2000	2032.0	2345	2230	180	66	2072	40	16	20	2150	2	48	62	M56	720.00	

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

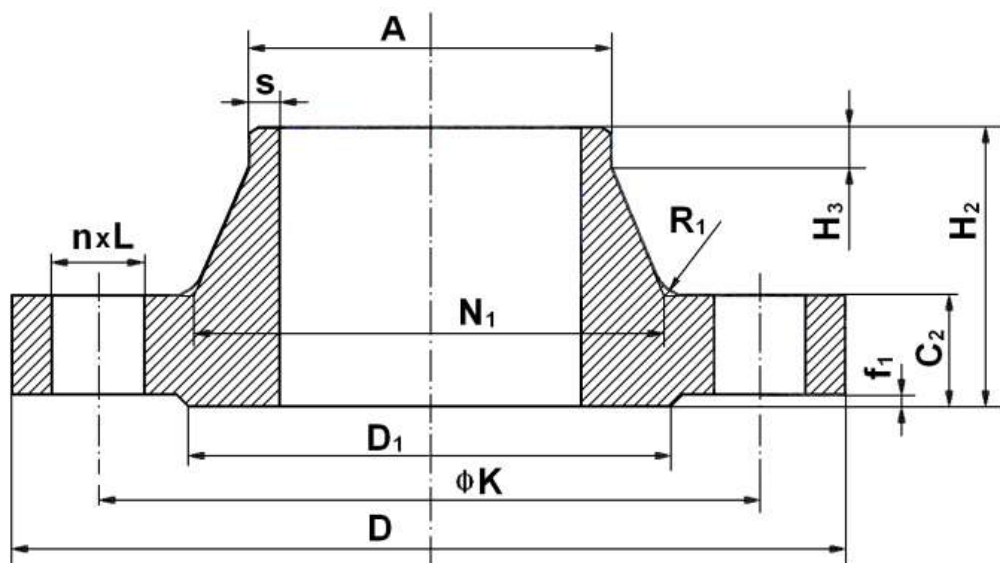
2.4.3. Flanse cu gat conform EN 1092-1 2001 Tip 11 PN 25
Welding Neck Flanges According to EN 1092-1 2001 Type 11 NP 25



tabel A 2.4.3. table A 2.4.3.

Teava		Dimensiunile flanseii										Suruburi		Masa (kg)	
Pipe		Flange Dimensions										Screws		(7.85Kg/dm ³)	
DN mm	A mm	D mm	K mm	H2 mm	C2 mm	N1 mm	H3 mm	R1 mm	s mm	D1 mm	f1 mm	n	L mm	filet	Weight (kg)
ND mm														thread	(7.85Kg/dm ³)
Pentru flansele cu diametrul nominal intre 10 si 150mm dimensiunile coincid cu EN 1092-1 PN 40 For flanges with the nominal diameter 10 to 150mm the measurement are identical EN 1092-1 PN 40															
200	219.1	360	310	80	30	244	16	10	6.3	278	2	12	26	M24	17.00
250	273.0	425	370	88	32	298	18	12	7.1	335	2	12	30	M27	24.00
300	323.9	485	430	92	34	352	18	12	8	395	2	16	30	M27	31.00
350	355.6	555	490	100	38	398	20	12	8	450	2	16	33	M30	48.00
400	406.4	620	550	110	40	452	20	12	8.8	505	2	16	36	M33	63.00
450	457.0	670	600	110	46	500	20	12	8.8	555	2	20	36	M33	75.50
500	508.0	730	660	125	48	558	20	12	10	615	2	20	36	M33	96.50
600	610.0	845	770	125	58	660	20	12	11	720	2	20	39	M36	138.60
700	711.0	960	875	125	46	760	20	12	12.5	820	2	24	42	M39	143.50
800	813.0	1085	990	135	50	864	22	12	14.2	930	2	24	48	M45	193.50
900	914.0	1185	1090	145	54	968	24	12	16	1030	2	28	48	M45	237.00
1000	1016.0	1320	1210	155	58	1070	24	16	17.5	1140	2	28	56	M52	310.50
Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.															
Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.															

2.4.4. Flanse cu gat conform EN 1092-1 2001 Tip 11 PN 40
Welding Neck Flanges According to EN 1092-1 2001 Type 11 NP 40



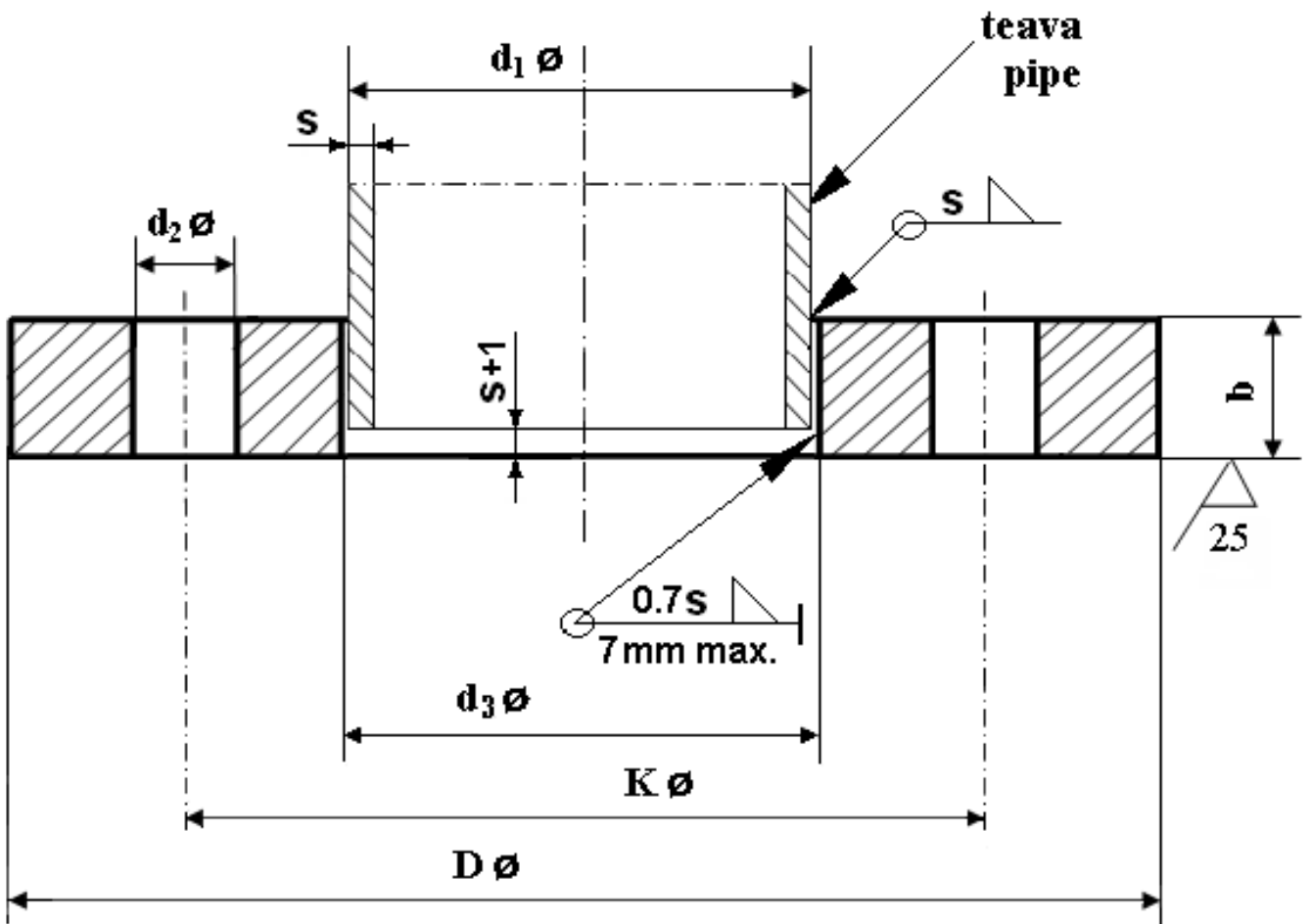
tabel A 2.4.4. table A 2.4.4.

Teava		Dimensiunile flansei										Suruburi		Masa (kg)	
Pipe		Flange Dimensions										Screws		(7.85Kg/dm ³)	
DN mm	A mm	D mm	K mm	H2 mm	C2 mm	N1 mm	H3 mm	R1 mm	s mm	D1 mm	f1 mm	n	L mm	filet thread	Weight (kg)
ND mm															(7.85Kg/dm ³)
10	17.2	90	60	35	16	28	6	4	1.8	40	2	4	14	M12	0.66
15	21.3	95	65	38	16	32	6	4	2	45	2	4	14	M12	0.75
20	26.9	105	75	40	18	40	6	4	2.3	58	2	4	14	M12	1.06
25	33.7	115	85	40	18	46	6	4	2.6	68	2	4	14	M12	1.29
32	42.4	140	100	42	18	56	6	6	2.6	78	2	4	18	M16	1.86
40	48.3	150	110	45	18	64	7	6	2.6	88	2	4	18	M16	2.25
50	60.3	165	125	48	20	75	8	6	2.9	102	2	4	18	M16	2.79
65	76.1	185	145	52	22	90	10	6	2.9	122	2	8	18	M16	3.74
80	88.9	200	160	58	24	105	12	8	3.2	138	2	8	18	M16	4.75
100	114.3	235	190	65	24	134	12	8	3.6	162	2	8	22	M20	6.44
125	139.7	270	220	68	26	162	12	8	4	188	2	8	26	M24	8.88
150	168.3	300	250	75	28	192	12	10	4.5	218	2	8	26	M24	11.45
200	219.1	375	320	88	34	244	16	10	6.3	285	2	12	30	M27	21.00
250	273.0	450	385	105	38	306	18	12	7.1	345	2	12	33	M30	34.00
300	323.9	515	450	115	42	362	18	12	8	410	2	16	33	M30	47.50
350	355.6	580	510	125	46	408	20	12	8.8	465	2	16	36	M33	69.00
400	406.4	660	585	135	50	462	20	12	11	535	2	16	39	M36	98.00
450	457.0	685	610	135	57	500	20	12	12.5	560	2	20	39	M36	105.08
500	508.0	755	670	140	57	562	20	12	14.2	615	2	20	42	M39	130.50
600	610.0	890	795	150	72	666	20	12	16	735	2	20	48	M45	211.50

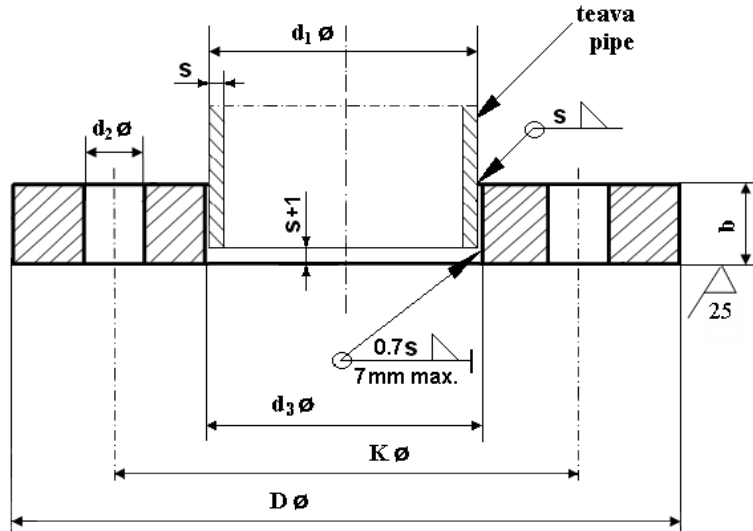
Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.
 Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

3. FLANSE CONFORM STANDARDELOR NORVEGIENE (NS) FLANGES ACCORDING TO NORWEGIAN STANDARDS (NS)

3.1. Flanse plate conform standardelor Norvegiene (NS) Flat Flanges According to Norwegian Standards (NS)



3.1.1. Flanse plate conform NS 2525 PN 6
Flat Flanges According to NS 2525 NP 6



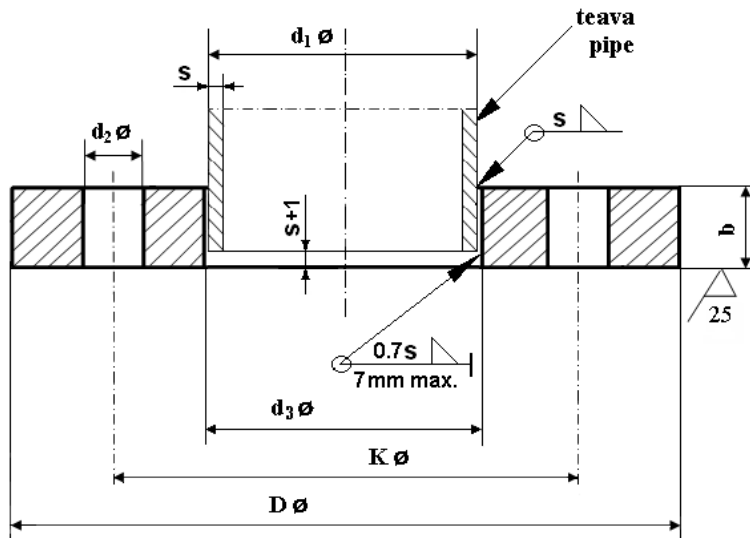
tabel A 3.1.1. table A 3.1.1.

Teava		Dimensiunile flansei				Suruburi			Masa (kg)
Pipe		Flange Dimensions				Screws			Weight (kg)
DN mm	d1 mm	d3 mm	D mm	b mm	k mm	buc	filet	d2 mm	(7.85Kg/dm3)
ND mm	n					thread			
15	21.3	22	80	12	55	4	M10	11	0.41
20	26.9	27.5	90	14	65	4	M10	11	0.60
25	33.7	34.5	100	14	75	4	M10	11	0.74
32	42.4	43	120	16	90	4	M12	14	1.19
40	48.3	49	130	16	100	4	M12	14	1.39
50	60.3	69	140	16	110	4	M12	14	1.53
65	76.1	77	160	16	130	4	M12	14	1.89
80	88.9	90	190	18	150	4	M16	18	2.98
100	111.3	115.5	210	18	170	4	M16	18	3.46
125	139.7	141.5	240	20	200	8	M16	18	4.60
150	168.3	170.5	265	20	225	8	M16	18	5.22
200	219.1	221.5	320	22	280	8	M16	18	7.15
250	273.0	276	375	24	350	12	M16	18	9.61
300	323.9	327	440	24	395	12	M20	22	12.60

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

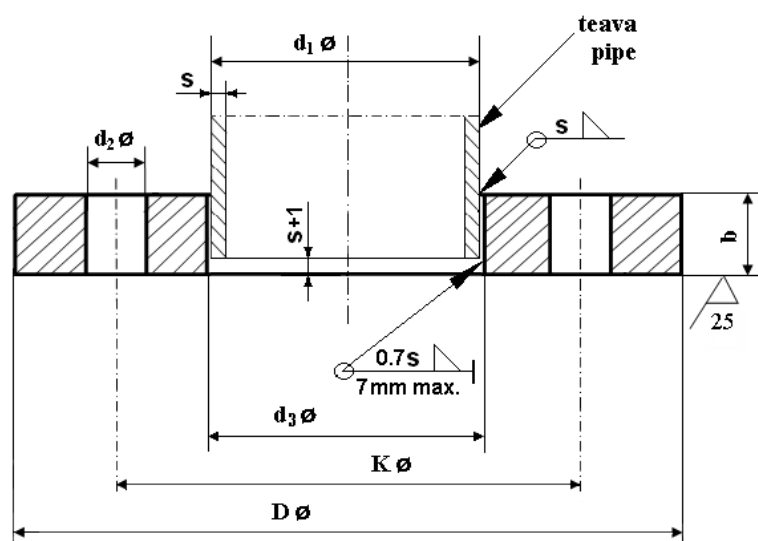
3.1.2. Flanse plate conform NS 2526 PN 10
Flat Flanges According to NS 2526 NP 10



tabel A 3.1.2. table A 3.1.2.

Teava		Dimensiunile flanseii				Suruburi			Masa (kg)	
Pipe		Flange Dimensions				Screws			Weight (kg)	
DN mm	d1 mm	d3 mm	D mm	b mm	k mm	buc n	filet thread	d2 mm	(7.85Kg/dm3)	
Pentru flanse cu diametrul nominal mai mic de 200mm vezi NS 2527 PN 16 For flanges with nominal diameter less than 200mm see NS 2527 NP 16										
200	219.1	221.5	+1 0	340	24	295	8	M20	22	9.38
250	273	276		395	26	350	12	M20	22	11.90
300	323.9	327		445	26	400	12	M20	22	13.70
350	355.6	359		505	28	460	16	M20	22	20.40
400	406.4	410		565	32	515	16	M24	26	27.70
(450)	456	461		615	34	565	20	M24	26	31.90
500	508	512	+2 0	670	34	620	20	M24	26	36.30
600	610	614		780	36	725	20	M27	30	47.30
700	711	716		895	38	840	24	M27	30	64.30
800	813	818		1015	42	950	24	M30	33	84.10
900	914	920		1115	46	1050	28	M30	33	107.00
1000	1016	1022		1230	52	1160	28	M33	36	140.00
Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.										
Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.										

3.1.3. Flanse plate conform NS 2527 PN 16 Flat Flanges According to NS 2527 NP 16



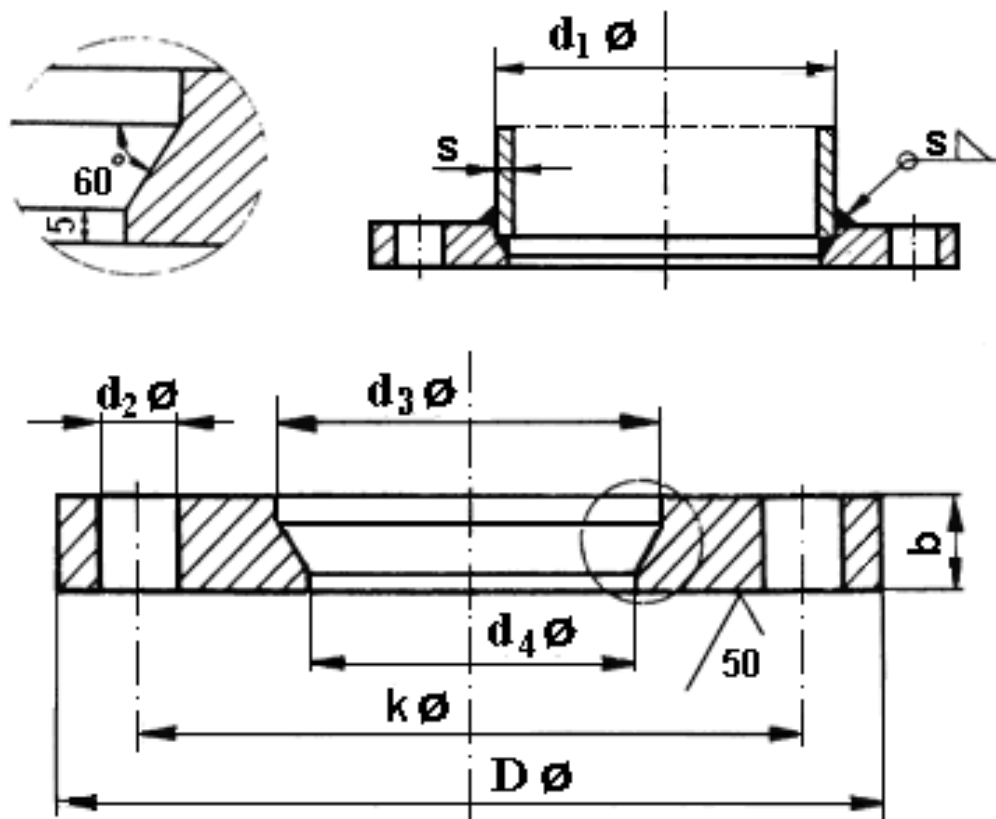
tabel A 3.1.3. table A 3.1.3.

Teava Pipe		Dimensiunile flanse Flange Dimensions				Suruburi Screws			Masa (kg) Weight (kg)							
DN mm	d1 mm	d3 mm	D mm	b mm	k mm	buc n	filet thread	d2 mm	(7.85Kg/dm3)							
15	20	21	95	12	65	4	M12	14	0.574							
	21.3	22														
20	25	26														
	26.9	27.5														
25	30	31														
	33.7	34.5														
32	38	39								140	16	100	4	M16	18	1.66
	42.4	43														
40	48.3	49														
50	60.3	61														
65	76.1	77														
80	88.9	90														
100	114.3	115.5														
125	139.7	141.5														
150	168.3	170.5														
(175)	193.7	196														315
200	219.1	221.5														
250	273.0	276														
300	323.9	327														
350	355.6	359														
400	406.4	410														
(450)	456	461														
500	508	512														
600	610	614														
700	711	716														
800	813	818														
900	914	920														
1000	1016	1022														

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

3.1.4. Flanse plate conform NS 2529 PN 40
Flat Flanges According to NS 2529 NP 40

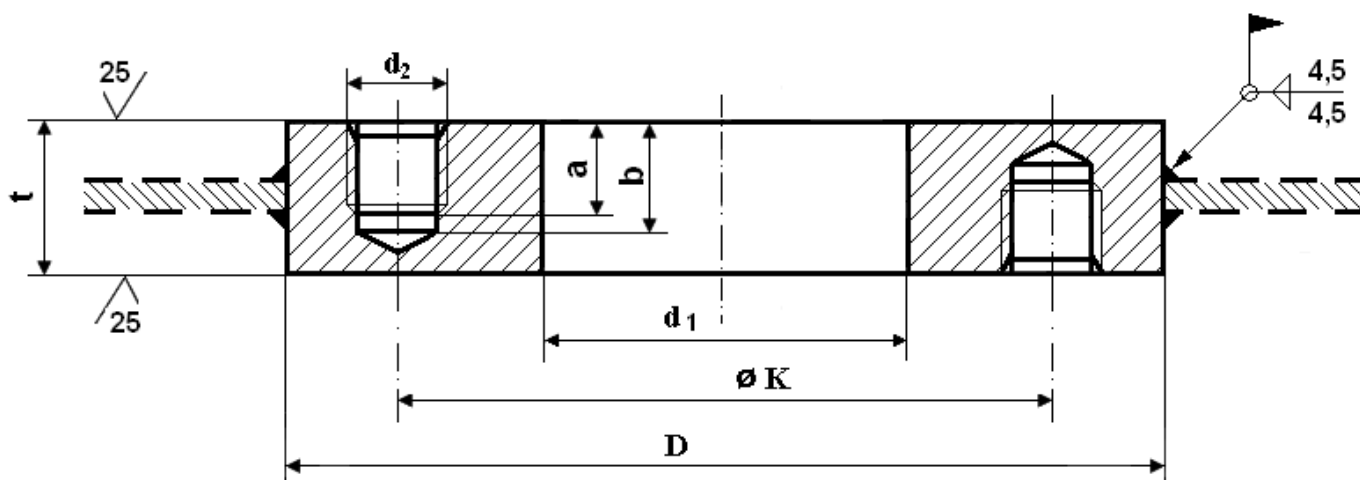
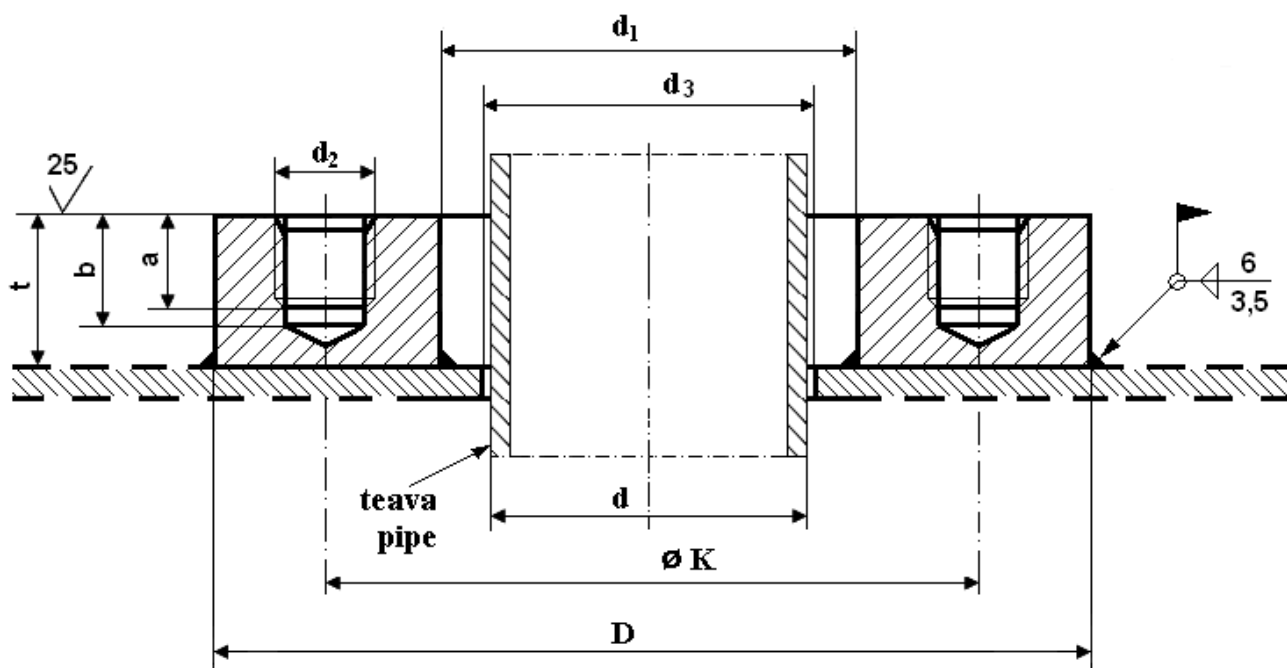


tabel A 3.1.4. table A 3.1.4.

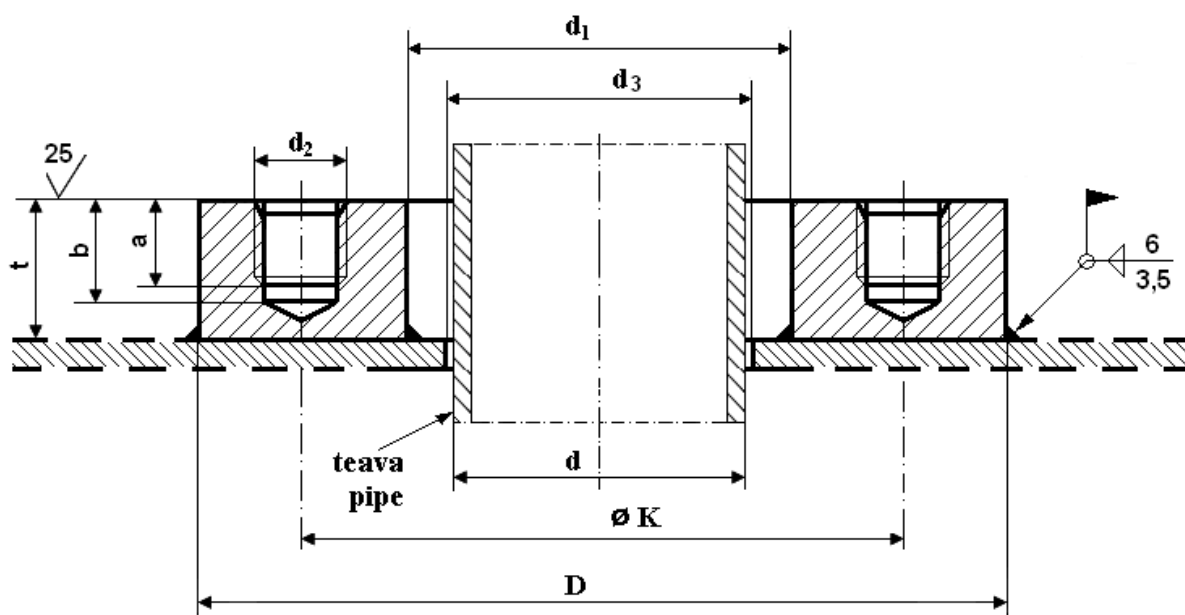
Teava		Dimensiunile flansei					Suruburi		
Pipe		Flange Dimensions					Screws		
DN mm	d1 mm	d3 mm	D mm	b mm	k mm	d4 mm	buc	filet	d2 mm
ND mm							n	thread	
40	48.3	49	+0.5 0	150	18	110	4	M16	18
50	60.3	69		165	20	125	4	M16	18
65	76.1	77		185	24	145	8	M16	18
80	88.9	90		200	24	160	8	M16	18
100	114.3	115.5		235	26	190	8	M20	22
125	139.7	141.5		270	26	220	8	M24	26
150	168.3	170.5		300	28	250	8	M24	26
200	219.1	221.5	+1 0	375	32	320	12	M27	30
250	273.0	276		450	36	385	12	M30	33

Flansele din oțel carbon sau din inox care nu sunt pe stoc pot fi livrate în 10-15 zile de la comanda.
 Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

3.2. Flanse de perete conform standardelor Norvegiene (NS) *Wall Flanges According to Norwegian Standards (NS)*



3.2.1. Flanse de perete cu o fata conform NS 2537 PN 10
Set-on Flange According to NS 2537 NP 10



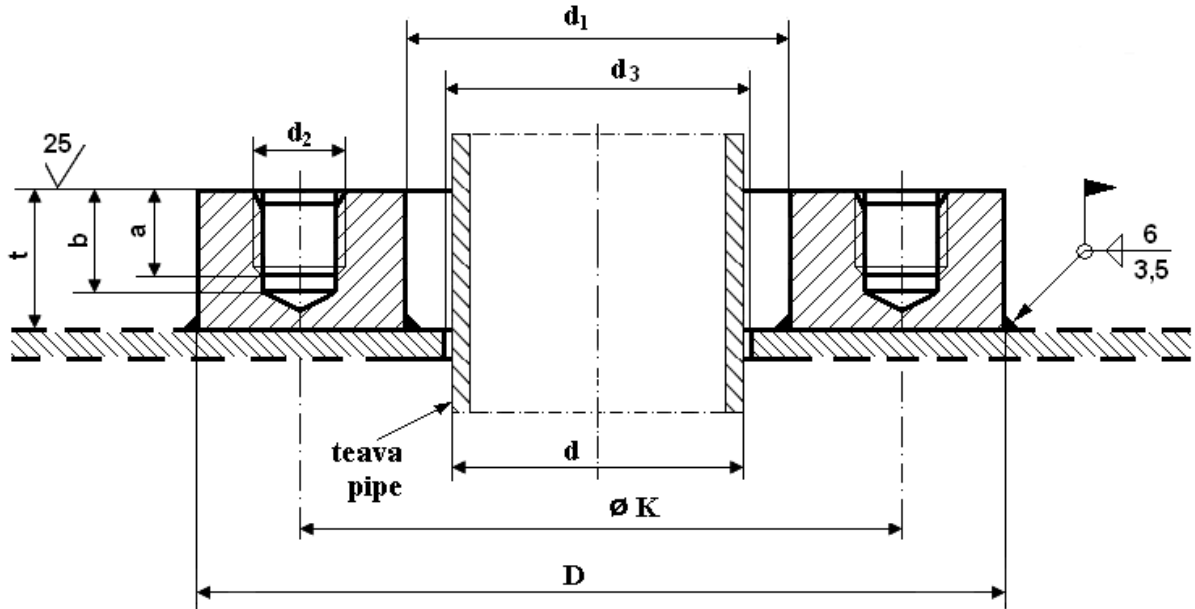
tabel A 3.2.1. table A 3.2.1.

Teava (mm)		Dimensiunile flansei				Tabla	Suruburi				Masa (kg)
Pipe (mm)		Flange Dimensions				Plate	Screws				Weight (kg)
DN	d	d1 mm	D mm	t mm	k mm	d3 mm	n	Filet	a mm	b mm	(7.85Kg/dm3)
ND	d							Thread			
15	21.3	36	95	28	65	24	4	M12	14	20	1,26
20	26.9	42	105	28	75	30	4	M12	14	20	1,53
25	33.7	49	115	28	85	37	4	M12	14	20	1,80
32	42.4	57	140	33	100	45	4	M16	19	25	3,17
40	48.3	63	150	33	110	51	4	M16	19	25	3,61
50	60.3	75	165	33	125	63	4	M16	19	25	4,24
65	76.1	91	185	33	145	79	4	M16	19	25	5,12
80	88.9	104	200	33	160	92	8	M16	19	25	5,62
100	114.3	130	220	33	180	118	8	M16	19	25	6,09
125	139.7	156	250	33	210	144	8	M16	19	25	7,45
150	168.3	184	285	33	240	172	8	M20	23	29	10,50
Se observa ca pentru flansele cu diametrul nominal intre 15 si 150mm dimensiunile coincid cu NS 2538 PN 16 You may observe that for flanges with the nominal diameter 15 to 150mm the measurement are identical NS 2538 PN 16											
200	219.1	246	340	38	295	224	8	M20	23	29	12,30
250	273	290	395	38	350	278	12	M20	23	29	16,00
300	323.9	342	445	38	400	330	12	M20	23	29	18,10
350	355.6	374	505	38	460	362	16	M20	23	29	25,80
400	406.4	425	565	44	515	413	16	M24	28	34	35,70
450	457	476	615	44	565	464	20	M24	28	34	38,70
500	508	528	670	44	620	516	20	M24	28	34	43,70

Aceste flanse, din otel carbon sau inox, nu se lucreaza pe stoc ele se livreaza doar la comanda ferma.

These flanges, from carbon steel or stainless steel, are not in stock they can be delivered only on special order.

3.2.2. Flanse de perete cu o fata conform NS 2538 PN 16
Set-on Flange According to NS 2538 NP 16



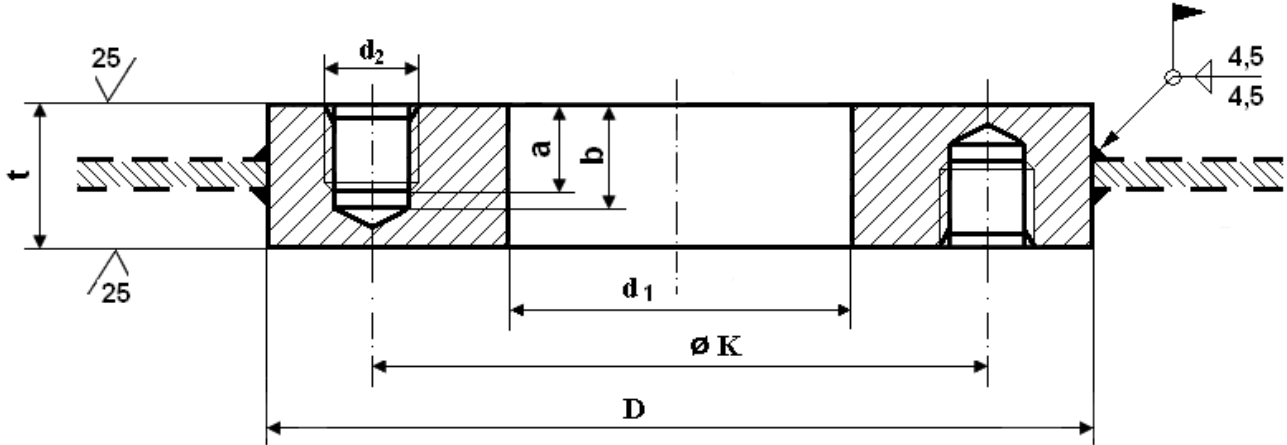
tabel A 3.2.2. table A 3.2.2.

Teava (mm)		Dimensiunile flanseii				Tabla	Suruburi				Masa (kg)
Pipe (mm)		Flange Dimensions				Plate	Screws				Weight (kg)
DN	d	d1 mm	D mm	t mm	k mm	d3 mm	n	Filet	a mm	b mm	(7.85Kg/dm3)
ND	d							Thread			
15	21.3	36	95	28	65	24	4	M12	14	20	1,26
20	26.9	42	105	28	75	30	4	M12	14	20	1,53
25	33.7	49	115	28	85	37	4	M12	14	20	1,80
32	42.4	57	140	33	100	45	4	M16	19	25	3,17
40	48.3	63	150	33	110	51	4	M16	19	25	3,61
50	60.3	75	165	33	125	63	4	M16	19	25	4,24
65	76.1	91	185	33	145	79	4	M16	19	25	5,12
80	88.9	104	200	33	160	92	8	M16	19	25	5,62
100	114.3	130	220	33	180	118	8	M16	19	25	6,09
125	139.7	156	250	33	210	144	8	M16	19	25	7,45
150	168.3	184	285	33	240	172	8	M20	23	29	10,50
200	219.1	246	340	38	295	224	8	M20	23	29	12,30
250	273	290	395	38	355	278	12	M20	23	29	16,00
300	323.9	342	445	38	410	330	12	M20	23	29	18,10
350	355.6	374	505	38	470	362	16	M20	23	29	25,80
400	406.4	425	565	44	525	413	16	M24	28	34	35,70
450	457	476	615	44	585	464	20	M24	28	34	38,70
500	508	528	670	44	650	516	20	M24	28	34	43,70

Aceste flanse, din otel carbon sau inox, nu se lucreaza pe stoc ele se livreaza doar la comanda ferma.

These flanges, from carbon steel or stainless steel, are not in stock they can be delivered only on special order.

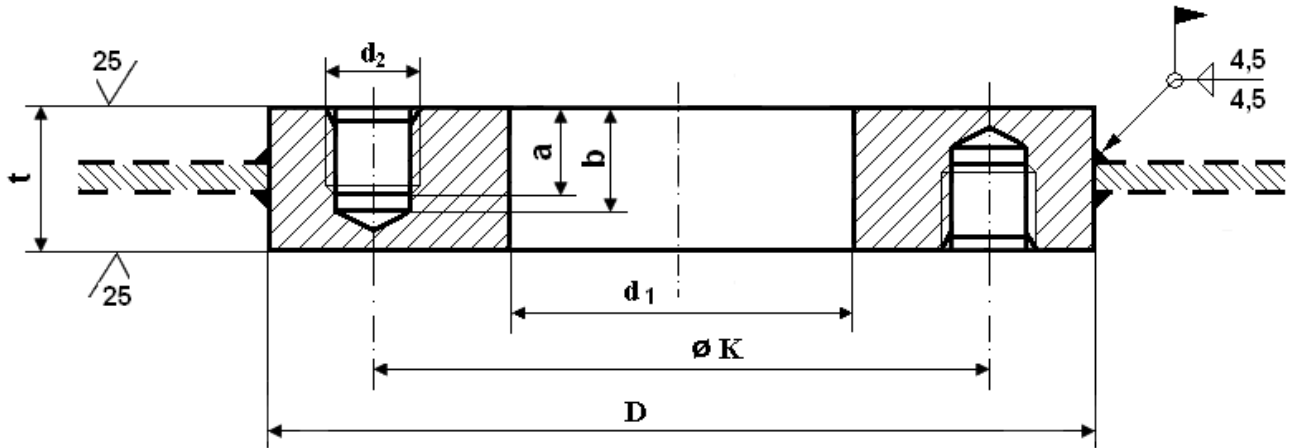
3.2.3. Flanse de perete cu doua fete conform NS 2539 PN 10 Set-in Flanges According to NS 2539 NP 10



tabel A 3.2.3. table A 3.2.3.

Teava (mm)		Dimensiunile flansei				Suruburi				Masa (kg)
Pipe (mm)		Flange Dimensions				Screws				Weight (kg)
DN	d	d1 mm	D mm	t mm	k mm	n	Filet d2 mm	a mm	b mm	(7.85Kg/dm3)
ND	d						Thread d2 mm			
15	21.3	15	95	33	65	2x 4	M12	14	20	1.70
20	26.9	20	105	33	75	2x 4	M12	14	20	2.07
25	33.7	25	115	33	85	2x 4	M12	14	20	2.47
32	42.4	32	140	33	100	2x 4	M16	19	25	3.50
40	48.3	43	150	33	110	2x 4	M16	19	25	3.93
50	60.3	55	165	33	125	2x 4	M16	19	25	4.64
65	76.1	70	185	33	145	2x 4	M16	19	25	5.68
80	88.9	82	200	33	160	2x 8	M16	19	25	6.21
100	114.3	107	220	33	180	2x 8	M16	19	25	6.96
125	139.7	132	250	33	210	2x 8	M16	19	25	8.61
150	168.3	160	285	38	240	2x 8	M20	23	29	12.00
Se observa ca pentru flansele cu diametrul nominal intre 15 si 150mm dimensiunile coincid cu NS 2540 PN 16 You may observe that for flanges with the nominal diameter 15 to 150mm the measurement are identical NS 2540 PN 16										
200	219.1	210	340	38	295	2x 8	M20	23	29	15,70
250	273	260	395	38	350	2x12	M20	23	29	19,10
300	323.9	310	445	38	400	2x12	M20	23	29	22,30
350	355.6	350	505	38	460	2x16	M20	23	29	28,90
400	406.4	400	565	44	515	2x16	M24	28	34	39,50
450	457	450	615	44	565	2x20	M24	28	34	43.00
500	508	500	670	44	620	2x20	M24	28	34	49,30
Aceste flanse, din otel carbon sau inox, nu se lucreaza pe stoc ele se livreaza doar la comanda ferma.										
These flanges, from carbon steel or stainless steel, are not in stock they can be delivered only on special order.										

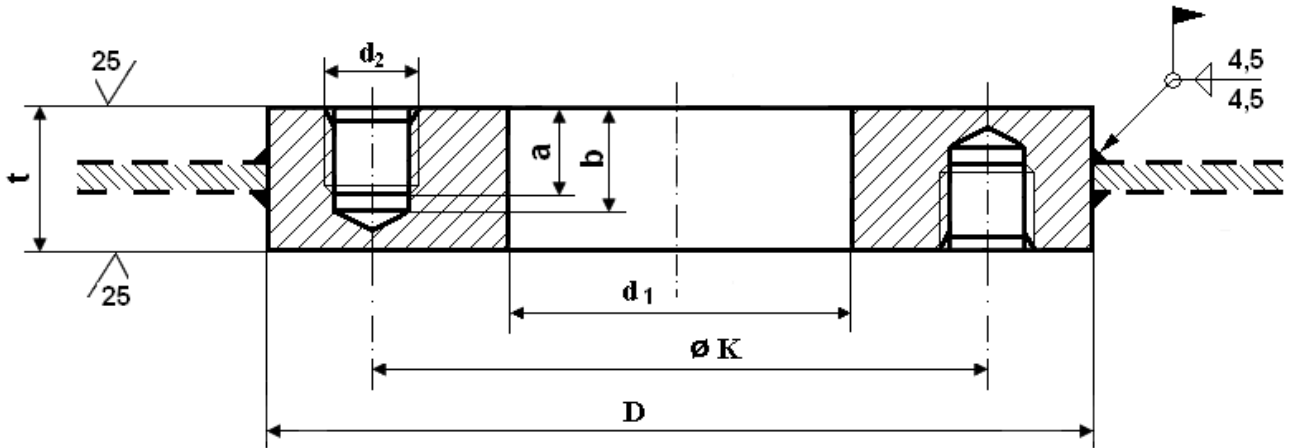
3.2.4. Flanse de perete cu doua fete conform NS 2540 PN 16
Set-in Flanges According to NS 2540 NP 16



tabel A 3.2.4. table A 3.2.4.

Teava (mm)		Dimensiunile flansei				Suruburi				Masa (kg)
Pipe (mm)		Flange Dimensions				Screws				Weight (kg)
DN	d	d1 mm	D mm	t mm	k mm	n	Filet d2 mm	a mm	b mm	(7.85Kg/dm3)
ND	d						Thread d2 mm			
15	21.3	15	95	33	65	2x 4	M12	14	20	1.70
20	26.9	20	105	33	75	2x 4	M12	14	20	2.07
25	33.7	25	115	33	85	2x 4	M12	14	20	2.47
32	42.4	32	140	33	100	2x 4	M16	19	25	3.50
40	48.3	43	150	33	110	2x 4	M16	19	25	3.93
50	60.3	55	165	33	125	2x 4	M16	19	25	4.64
Se observa ca pentru flansele cu diametrul nominal intre 15 si 50mm dimensiunile coincid cu NS 2542 PN 40 You may observe that for flanges with the nominal diameter 15 to 50mm the measurement are identical NS 2542 PN 40										
65	76.1	70	185	33	145	2x 4	M16	19	25	5.68
Se observa ca pentru flansa cu diametrul nominal 80mm dimensiunile coincid cu NS 2542 PN 40 You may observe that for flange with the nominal 80mm the measurement are identical NS 2542 PN 40										
80	88.9	82	200	33	160	2x 8	M16	19	25	6.21
100	114.3	107	220	33	180	2x 8	M16	19	25	6.96
125	139.7	132	250	33	210	2x 8	M16	19	25	8.61
150	168.3	160	285	38	240	2x 8	M20	23	29	12.00
175	193.7	185	315	38	270	2x 8	M20	23	29	14.20
200	219.1	210	340	38	295	2x12	M20	23	29	15.20
250	273	260	405	44	355	2x12	M24	28	34	23.40
300	323.9	310	460	44	410	2x12	M24	28	34	28.60
350	355.6	350	520	44	470	2x16	M24	28	34	36.40
400	406.4	400	580	49	525	2x16	M27	31	39	47.80
450	457	450	640	49	585	2x20	M27	31	39	55.70
500	508	500	715	55	650	2x20	M30	34	43	79.20
Aceste flanse, din otel carbon sau inox, nu se lucreaza pe stoc ele se livreaza doar la comanda ferma. These flanges, from carbon steel or stainless steel, are not in stock they can be delivered only on special order.										

3.2.5. Flanse de perete cu doua fete conform NS 2542 PN 40
Set-in Flanges According to NS 2542 NP 40

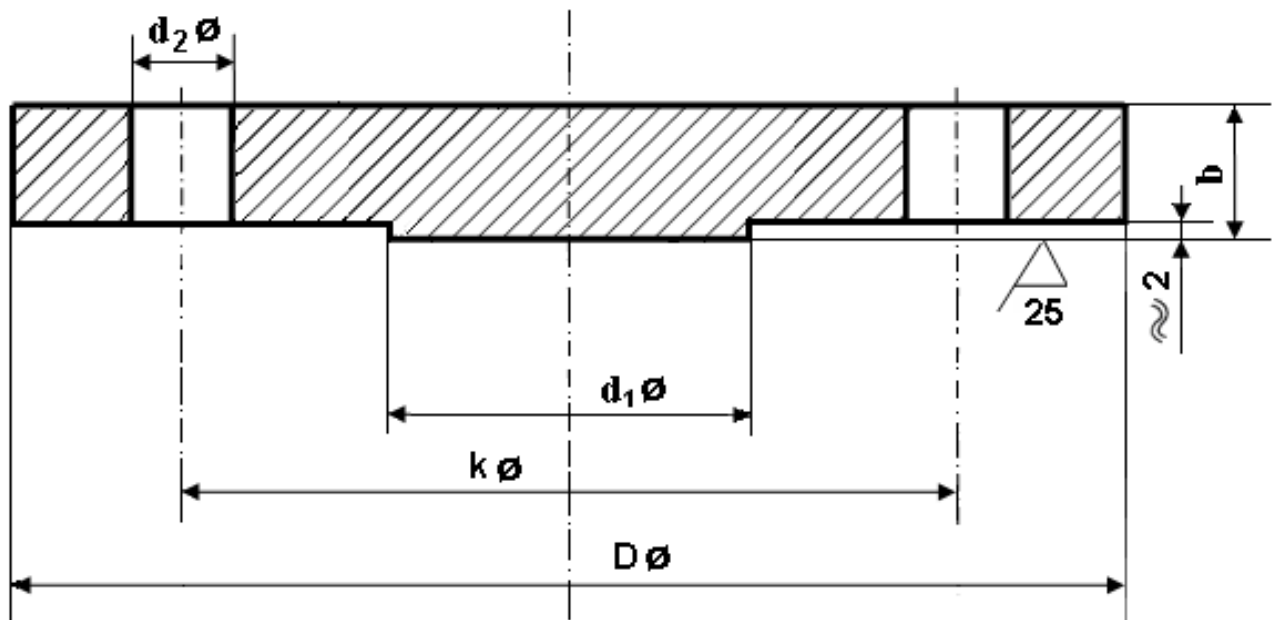


tabel A 3.2.5. table A 3.2.5.

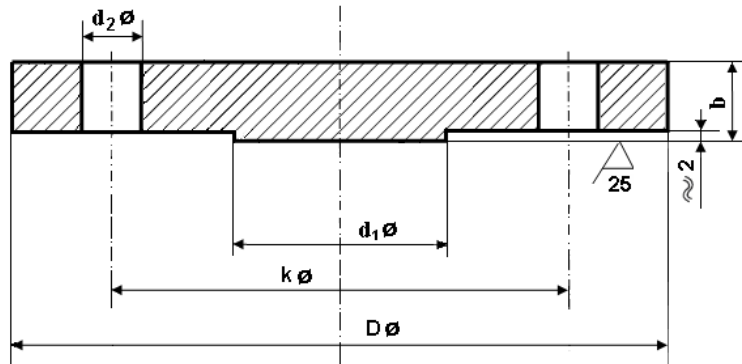
Teava (mm)		Dimensiunile flanse				Suruburi				Masa (kg)
Pipe (mm)		Flange Dimensions				Screws				Weight (kg)
DN	d	d1 mm	D mm	t mm	k mm	n	Filet	a mm	b mm	(7.85Kg/dm ³)
ND	d						Thread			
15	21.3	15	95	33	65	2x 4	M12	14	20	1.70
20	26.9	20	105	33	75	2x 4	M12	14	20	2.07
25	33.7	25	115	33	85	2x 4	M12	14	20	2.47
32	42.4	32	140	33	100	2x 4	M16	19	25	3.50
40	48.3	43	150	33	110	2x 4	M16	19	25	3.93
50	60.3	55	165	33	125	2x 4	M16	19	25	4.64
65	76.1	70	185	33	145	2x 8	M16	19	25	5.40
80	88.9	82	200	33	160	2x 8	M16	19	25	6.21
100	114.3	107	235	38	190	2x 8	M20	23	29	9.19
125	139.7	132	270	44	220	2x 8	M24	28	34	13.20
150	168.3	160	300	44	250	2x 8	M24	28	34	15.60
175	193.7	185	350	49	295	2x12	M27	31	39	22.60
200	219.1	210	375	49	320	2x12	M27	31	39	25.10
250	273	260	450	55	385	2x12	M30	34	43	40.10

Aceste flanse, din otel carbon sau inox, nu se lucreaza pe stoc, ele se livreaza doar la comanda ferma.
 These flanges, from carbon steel or stainless steel, are not in stock, they can be delivered only on special order.

3.3. Flanse oarbe conform standardelor Norvegiene (NS)
Blind Flanges According to Norwegian Standards (NS)



3.3.1. Flanse oarbe conform NS 2545 PN 10 Blind Flanges According to NS 2545 NP 10



tabel A 3.3.1. table A 3.3.1.

DN mm	Dimensiunile flansei				Suruburi			Masa (kg)
	Flange Dimensions				Screws			Weight (kg)
ND mm	d1 mm	D mm	b mm	k mm	buc	filet	d2 mm	(7.85Kg/dm3)
					n	thread		
Pentru diametre nominale intre 15-175mm vezi NS 2546 PN 16 For nominal diametres 15-175mm see NS 2546 NP 16								
200	190	340	24	295	8	M20	22	17.00
250	235	395	26	350	12	M20	22	24.50
300	285	445	26	400	12	M20	22	31.80
350	330	506	26	460	16	M20	22	41.00
400	380	565	26	515	16	M24	26	51.20
450	425	615	28	565	20	M24	26	65.20
500	475	670	28	620	20	M24	26	78.00
600	580	780	32	725	20	M27	30	121.00
700	680	895	36	840	24	M27	30	179.00
800	785	1015	40	950	24	M27	30	255.00
Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.								
Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.								

3.3.2. Flanse oarbe conform NS 2546 PN 16 Blind Flanges According to NS 2546 NP 16

tabel A 3.3.2. table A 3.3.2.

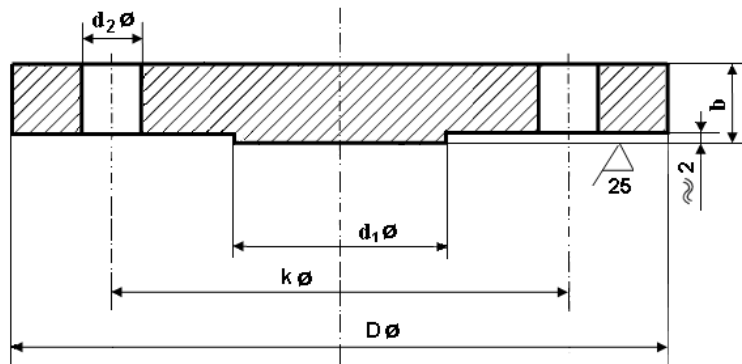
DN mm	Dimensiunile flansei				Suruburi			Masa (kg)
	Flange Dimensions				Screws			Weight (kg)
ND mm	d1 mm	D mm	b mm	k mm	buc	filet	d2 mm	(7.85Kg/dm3)
					n	thread		
15	-	95	14	65	4	M12	14	0.72
20	-	105	16	75	4	M12	14	1.01
25	-	115	16	85	4	M12	14	1.23
32	-	140	16	100	4	M16	18	1.80
40	-	150	16	110	4	M16	18	2.09
50	-	165	18	125	4	M16	18	2.88
65	55	185	18	145	4	M16	18	3.66
80	70	200	20	160	8	M16	18	4.77
100	90	220	20	180	8	M16	18	5.65
125	115	250	22	210	8	M16	18	8.42
150	140	285	22	240	8	M20	22	10.40
175	165	345	24	270	8	M20	22	14.00

tabel A 3.3.2. (continuare) table A 3.3.2. (continued)

DN mm	Dimensiunile flansei				Suruburi			Masa (kg)
	Flange Dimensions				Screws			Weight (kg)
ND mm	d1 mm	D mm	b mm	k mm	buc	filet	d2 mm	(7.85Kg/dm3)
					n	thread		
200	165	340	24	295	12	M20	22	16.10
250	190	405	26	355	12	M24	26	24.90
300	235	460	28	410	12	M24	26	35.10
350	285	520	30	470	16	M24	26	47.80
400	330	580	32	525	16	M27	30	63.50
450	380	640	34	585	20	M27	30	84.20
500	425	715	36	650	20	M30	33	102.00

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.
Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

3.3.3. Flanse oarbe conform NS 2547 PN 40 Blind Flanges According to NS 2547 NP 40



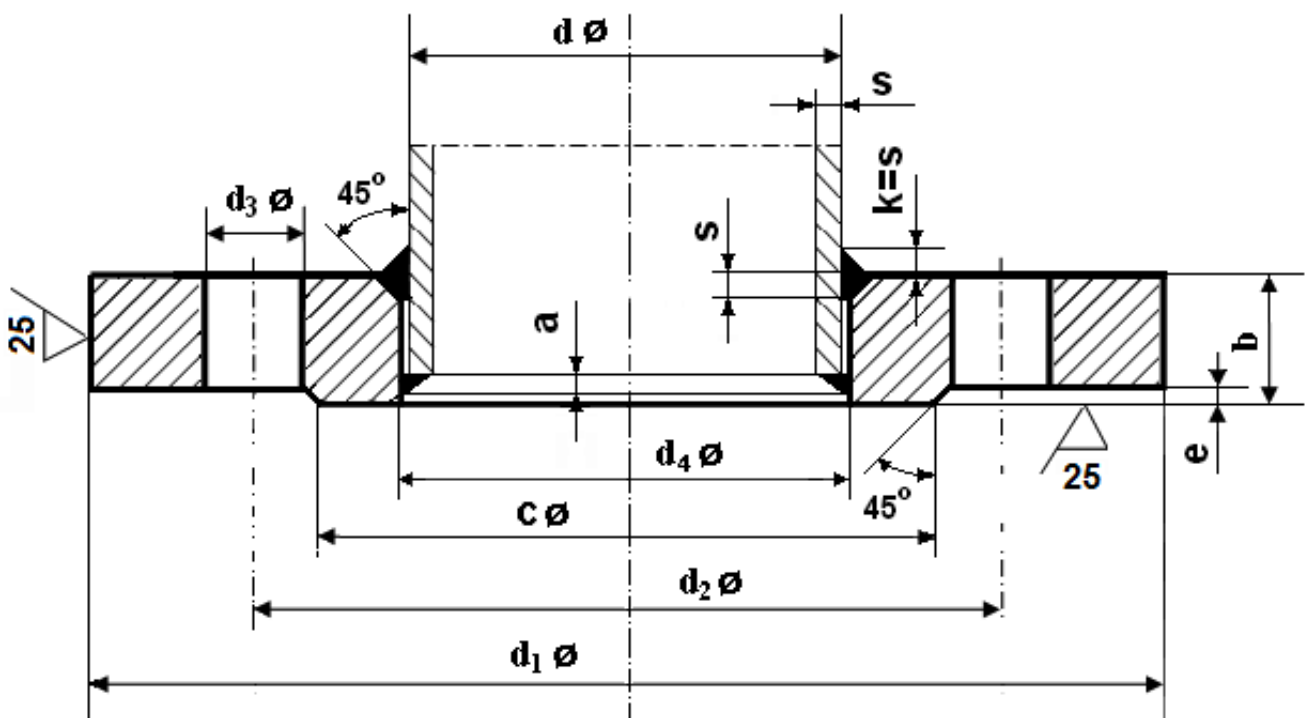
tabel A 3.3.3. table A 3.3.3.

DN mm	Dimensiunile flansei				Suruburi			Masa (kg)
	Flange Dimensions				Screws			Weight (kg)
ND mm	d1 mm	D mm	b mm	k mm	buc	filet	d2 mm	(7.85Kg/dm3)
					n	thread		
15	-	95	16	65	4	M12	14	0.81
20	-	105	18	75	4	M12	14	1.24
25	-	115	18	85	4	M12	14	1.38
32	-	140	18	100	4	M16	18	2.03
40	-	150	18	110	4	M16	18	2.35
50	-	165	20	125	4	M16	18	3.20
65	-	185	22	145	8	M16	18	4.29
80	-	200	24	160	8	M16	18	5.88
100	-	235	24	190	8	M20	22	7.54
125	-	270	26	220	8	M24	26	10.80
150	-	300	28	250	8	M24	26	14.50
200	-	375	34	320	12	M27	30	27.20
250	-	450	38	385	12	M30	30	43.80
300	-	515	42	450	16	M30	30	63.30
350	-	580	46	510	16	M33	36	89.50
400	-	660	50	585	16	M36	39	127.00
450	-	685	54	610	20	M36	39	151.00
500	-	755	56	670	20	M39	42	172.00

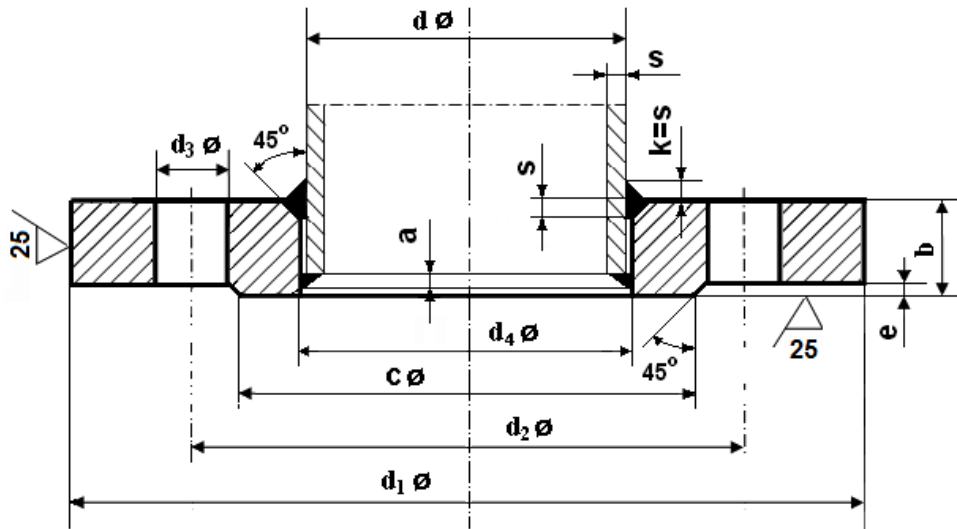
Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.
Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

4. FLANSE CONFORM STANDARDELOR ROMANESTI STAS FLANGES ACCORDING TO ROMANIAN STANDARDS STAS

4.1. Flanse plate conform standardelor romanesti STAS Flat Flanges According to Romanian Standards STAS



4.1.1. Flanse plate conform STAS 8012-84 PN 6
Flat Flanges According to STAS 8012-84 NP 6



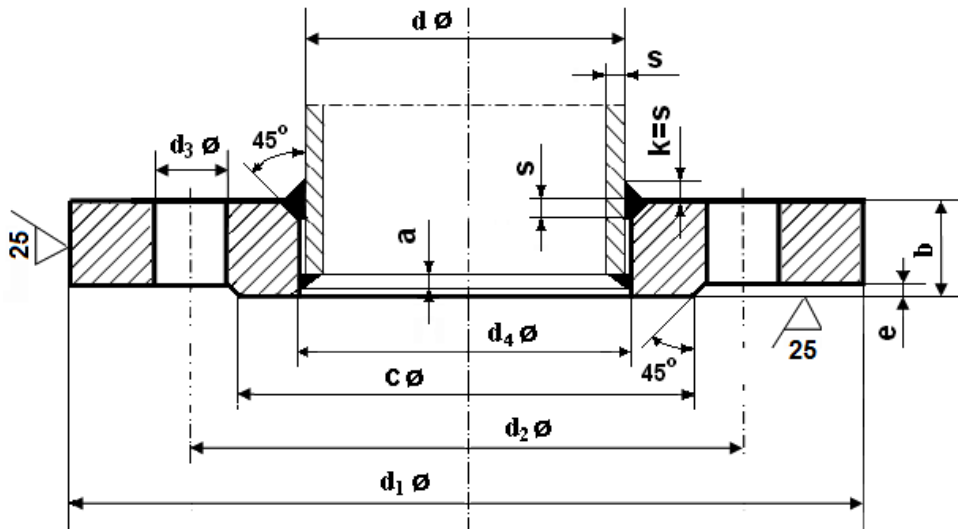
tabel A 4.1.1. table A 4.1.1.

Teava			Dimensiunile flansei					Etansare			Suruburi		Masa (kg)
Pipe			Flange Dimensions					Raised			Screws		Weight (kg)
DN mm	d mm	a mm	d1 mm	d2 mm	d3 mm	d4 mm	b mm	e mm	c mm	buc	filet	(7.85Kg/dm3)	
ND mm									n	thread			
10	14	1	75	50	11	14.5	10	2	35	4	M10	0.25	
15	20	1	80	55	11	20.5	10	2	40	4	M10	0.28	
20	25	1	90	65	11	25.5	10	2	50	4	M10	0.44	
25	30	1	100	75	11	30.5	12	2	60	4	M10	0.55	
	34					34.5						0.53	
32	38	1	120	90	14	38.5	14	2	70	4	M12	0.93	
	42					42.5						0.90	
40	45	1	130	100	14	45.5	14	3	80	4	M12	1.03	
	48					48.5						1.00	
50	57	1	140	110	14	57.5	14	3	90	4	M12	1.14	
	60					60.5						1.11	
65	76	1	160	130	14	77	14	3	110	4	M12	1.39	
80	89	1	190	150	18	90	16	3	128	4	M16	2.29	
100	108	1	210	170	18	109	16	3	148	4	M16	2.66	
	114					115						2.53	
125	133	1	240	200	18	134	18	3	178	8	M16	3.68	
	140					141						3.46	
150	159	1	265	225	18	160	20	3	202	8	M16	4.68	
	168					169						4.32	
200	219	1	320	280	18	220	22	3	258	8	M16	6.35	
250	273	1	375	335	18	274	24	3	312	12	M16	8.39	
300	324	2	440	395	22	325	24	4	365	12	M20	10.80	
350	356	2	490	445	22	357	26	4	415	12	M20	15.60	
	377					378						13.10	
400	406.4	2	540	495	22	408	28	4	465	16	M20	18.70	
500	508	2	645	600	22	510	30	4	570	20	M20	25.10	
600	609.6	2	755	705	26	612	30	5	670	20	M24	25.70	

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

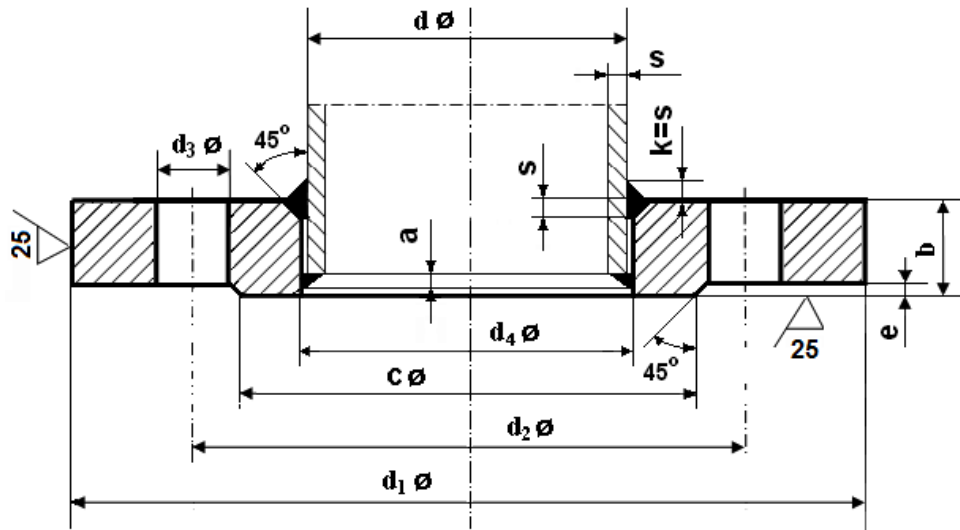
4.1.2. Flanse plate conform STAS 8013-84 PN 10
Flat Flanges According to STAS 8013-84 NP 10



tabel A 4.1.2. table A 4.1.2.

Teava			Dimensiunile flansei					Etansare		Suruburi		Masa (kg)
Pipe			Flange Dimensions					Raised		Screws		Weight (kg)
DN mm	d mm	a mm	d1 mm	d2 mm	d3 mm	d4 mm	b mm	e mm	c mm	buc n	filet thread	(7.85Kg/dm3)
ND mm												
<p>Se observa ca pentru flanse cu diametrul nominal intre 10 si 150mm dimensiunile coincid cu STAS 8014 PN 16 You mai observe that for flanges with the nominal diameter 10 to 150mm the measurement are identical STAS 8014 NP 16</p>												
10	14	1	90	60	14	14.5	12	2	42	4	M12	0.45
15	20	1	95	65	14	20.5	12	2	47	4	M12	0.50
20	25	1	105	75	14	25.5	14	2	58	4	M12	0.74
25	30	1	115	85	14	30.5	14	2	68	4	M12	0.88
	34					34.5						0.86
32	38	1	140	100	18	38.5	16	2	78	4	M16	1.50
	42					42.5						1.47
40	45	1	150	110	18	45.5	16	3	88	4	M16	1.64
	48					48.5						1.61
50	57	1	165	125	18	57.5	18	3	102	4	M16	2.22
	60					60.5						2.18
65	76	1	185	145	18	77	18	3	122	8	M16	2.66
80	89	1	200	160	18	90	20	3	133	8	M16	3.27
100	108	1	220	180	18	109	22	3	158	8	M16	4.16
	114					115						3.97
125	133	1	250	210	18	134	24	3	184	8	M16	5.75
	140					141						5.47
150	159	1	285	240	22	160	24	3	212	8	M20	7.05
	168					169						6.66
200	219	1	340	295	22	220	26	3	268	8	M20	9.42
250	273	1	395	350	22	274	28	3	320	12	M20	12.10
300	324	2	445	400	22	325	28	4	370	12	M20	13.60
350	356	2	505	460	22	357	30	4	430	16	M20	20.60
	377					378						17.90
400	406.4	2	565	515	26	408	32	4	482	16	M24	16.10
500	508	2	670	620	26	510	34	4	585	20	M24	34.40
600	609.6	2	780	725	30	612	36	5	685	20	M27	38.60
<p>Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda. Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.</p>												

4.1.3. Flanse plate conform STAS 8014-84 PN 16
Flat Flanges According to STAS 8014-84 NP 16



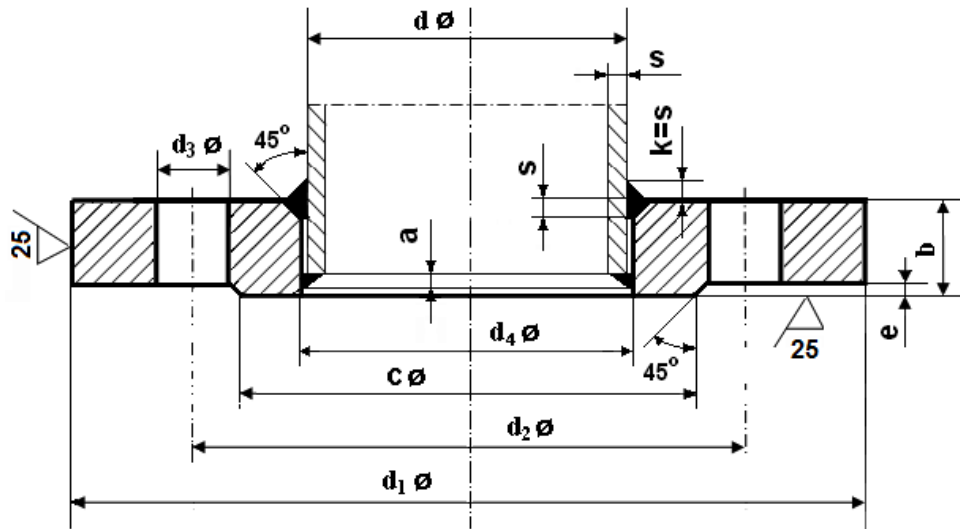
tabel A 4.1.3. table A 4.1.3.

Teava		Dimensiunile flansei					Etansare			Suruburi		Masa (kg)
Pipe		Flange Dimensions					Raised			Screws		Weight (kg)
DN mm	d mm	a mm	d1 mm	d2 mm	d3 mm	d4 mm	b mm	e mm	c mm	buc	filet	(7.85Kg/dm3)
ND mm										n	thread	
10	14	1	90	60	14	14.5	12	2	42	4	M12	0.45
15	20	1	95	65	14	20.5	12	2	47	4	M12	0.50
20	25	1	105	75	14	25.5	14	2	58	4	M12	0.74
25	30	1	115	85	14	30.5	14	2	68	4	M12	0.88
	34					34.5						0.86
32	38	1	140	100	18	38.5	16	2	78	4	M16	1.50
	42					42.5						1.47
40	45	1	150	110	18	45.5	16	3	88	4	M16	1.64
	48					48.5						1.61
50	57	1	165	125	18	57.5	18	3	102	4	M16	2.22
	60					60.5						2.18
65	76	1	185	145	18	77	18	3	122	8	M16	2.66
80	89	1	200	160	18	90	20	3	133	8	M16	3.27
100	108	1	220	180	18	109	22	3	158	8	M16	4.16
	114					115						3.97
125	133	1	250	210	18	134	24	3	184	8	M16	5.75
	140					141						5.47
150	159	1	285	240	22	160	24	3	212	8	M20	7.05
	168					169						6.66
200	219	1	340	295	22	220	26	3	268	12	M20	9.13
250	273	1	405	355	26	274	32	3	320	12	M24	14.90
300	324	2	460	410	26	325	32	4	370	12	M24	17.80
350	356	2	520	470	26	357	36	4	430	16	M24	28.20
	377					378						24.80
400	406.4	2	580	525	30	408	38	4	482	16	M27	34.60
500	508	2	715	650	33	510	44	4	585	20	M30	59.30
600	609.6	2	840	770	36	612	48	5	685	20	M33	79.00

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

4.1.4. Flanse plate conform STAS 8015-84 PN 25
Flat Flanges According to STAS 8015-84 NP 25



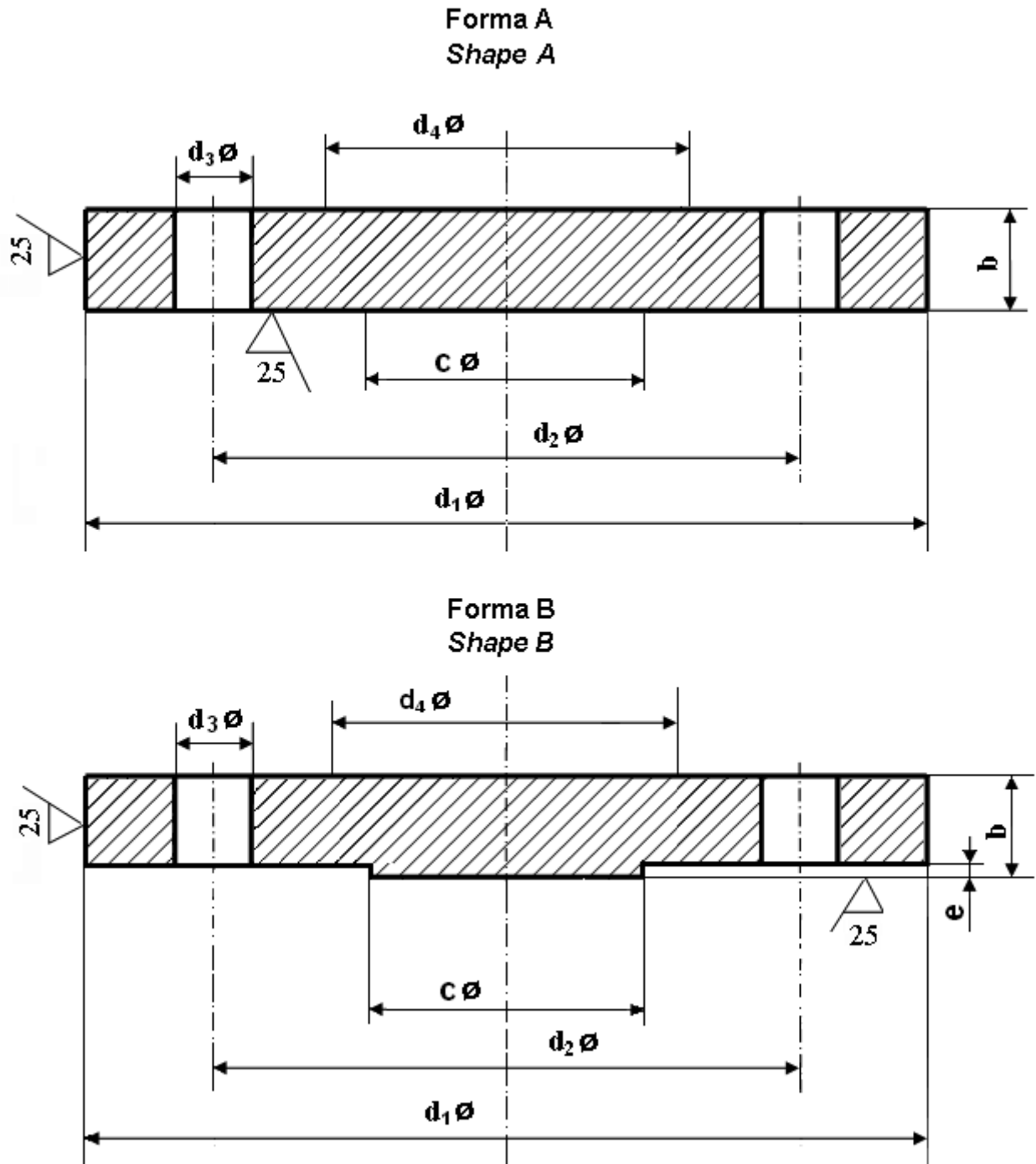
tabel A 4.1.4. table A 4.1.4.

Teava			Dimensiunile flanseii					Etansare		Suruburi		Masa (kg)
Pipe			Flange Dimensions					Raised		Screws		Weight (kg)
DN mm	d mm	a mm	d1 mm	d2 mm	d3 mm	d4 mm	b mm	e mm	c mm	buc	filet	(7.85Kg/dm ³)
ND mm									n	thread		
10	14	1	90	60	14	14.5	14	2	42	4	M12	0.54
15	20	1	95	65	14	20.5	14	2	47	4	M12	0.61
20	25	1	105	75	14	25.5	16	2	58	4	M12	0.86
25	30	1	115	85	14	30.5	16	2	68	4	M12	1.03
	34					34.5						1.01
32	38	1	140	100	18	38.5	18	2	78	4	M16	1.71
	42					42.5						1.68
40	45	1	150	110	18	45.5	18	3	88	4	M16	1.88
	48					48.5						1.74
50	57	1	165	125	18	57.5	20	3	102	4	M16	2.50
	60					60.5						2.45
65	76	1	185	145	18	77	24	3	122	8	M16	3.49
80	89	1	200	160	18	90	26	3	133	8	M16	4.35
100	108	1	235	190	22	109	26	3	158	8	M20	5.86
	114					115						5.64
125	133	1	270	220	26	134	28	3	184	8	M24	7.95
	140					141						7.62
150	159	1	300	250	26	160	30	3	212	8	M24	10.22
	168					169						9.67
200	219	1	360	310	26	220	32	3	278	12	M24	13.60
250	273	1	425	370	30	274	36	3	335	12	M27	20.00
300	324	2	485	430	30	325	40	4	390	16	M27	26.70
350	356	2	555	490	33	357	40	4	450	16	M30	47.10
	377					378						37.90
400	406.4	2	620	550	36	408	48	4	505	16	M33	55.90
500	508	2	730	660	36	510	54	4	615	20	M33	79.00

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

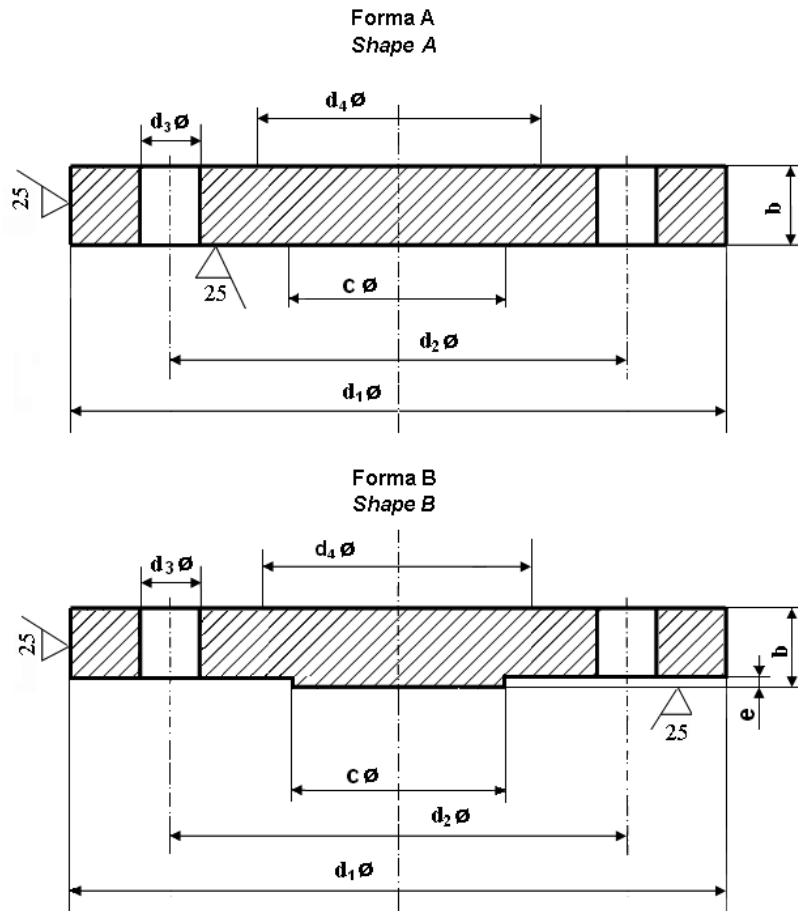
**4.2. Flanse oarbe conform standardelor romanesti (STAS)
Blind Flanges According to Romanian Standards (STAS)**



NOTA: Cotele „c” pentru forma A si respectiv „d₄” pentru formele A si B se regasesc si au semnificatia din figura aferenta flanselor plate (STAS 8012 – 8015) pag.17-20.

NOTE: The quotas „c” for shape A and respective „d₄” for the shape A and B may be see and they have the signification from afferent figure flat flanges (STAS 8012 – 8015) page 17-20.

4.2.1. Flanse oarbe conform STAS 7451-88 PN 6
Blind Flanges According to STAS 7451-88 NP 6



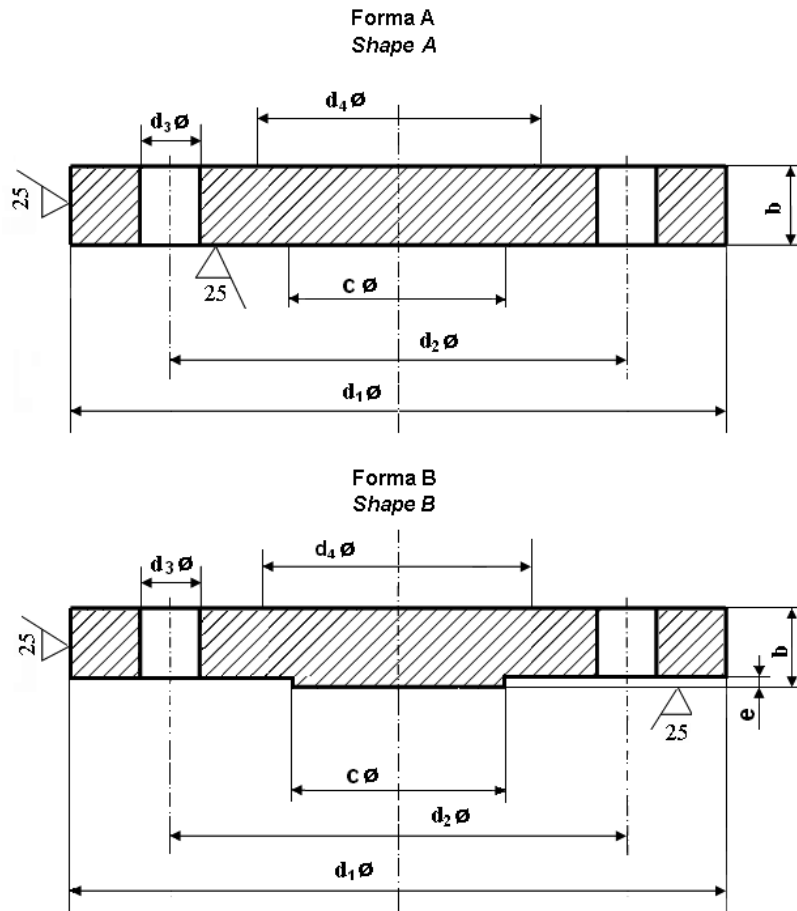
tabel A 4.2.1. table A 4.2.1.

DN mm	Dimensiunile flansei					Etansare		Suruburi		Masa (kg) (7.85Kg/dm ³)	
	Flange Dimensions					Raised		Screws		Weight (kg) (7.85Kg/dm ³)	
ND mm	d1 mm	d2 mm	d3 mm	d4 max mm	b mm	c max mm	e max mm	buc n	filet thread	Forma A Shape A	Forma B Shape B
10	75	50	11	25	12	-	2	4	M10	0.38	-
15	80	55	11	30	12	-	2	4	M10	0.44	-
20	90	65	11	40	14	-	2	4	M10	0.65	-
25	100	75	11	50	14	-	2	4	M10	0.82	-
32	120	90	14	60	14	-	2	4	M12	1.17	-
40	130	100	14	70	14	-	3	4	M12	1.39	-
50	140	110	14	80	14	-	3	4	M12	1.62	-
65	160	130	14	100	14	55	3	4	M12	2.44	2.48
80	190	150	18	110	16	70	3	4	M16	3.43	3.49
100	210	170	18	130	16	90	3	4	M16	4.76	4.86
125	240	200	18	160	18	115	3	8	M16	6.11	6.28
150	265	225	18	185	18	140	3	8	M16	7.51	7.75
200	320	280	18	240	20	190	3	8	M16	12.30	12.70
250	375	335	18	295	22	235	3	12	M16	18.30	19.60
300	440	395	22	350	22	285	4	12	M20	25.30	26.30
350	490	445	22	395	22	330	4	12	M20	31.60	32.90
400	540	495	22	445	22	380	4	16	M20	38.40	40.20
500	645	600	22	550	24	475	4	20	M20	60.40	63.20

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

4.2.2. Flanse oarbe conform STAS 7451-88 PN 10
Blind Flanges According to STAS 7451-88 NP 10



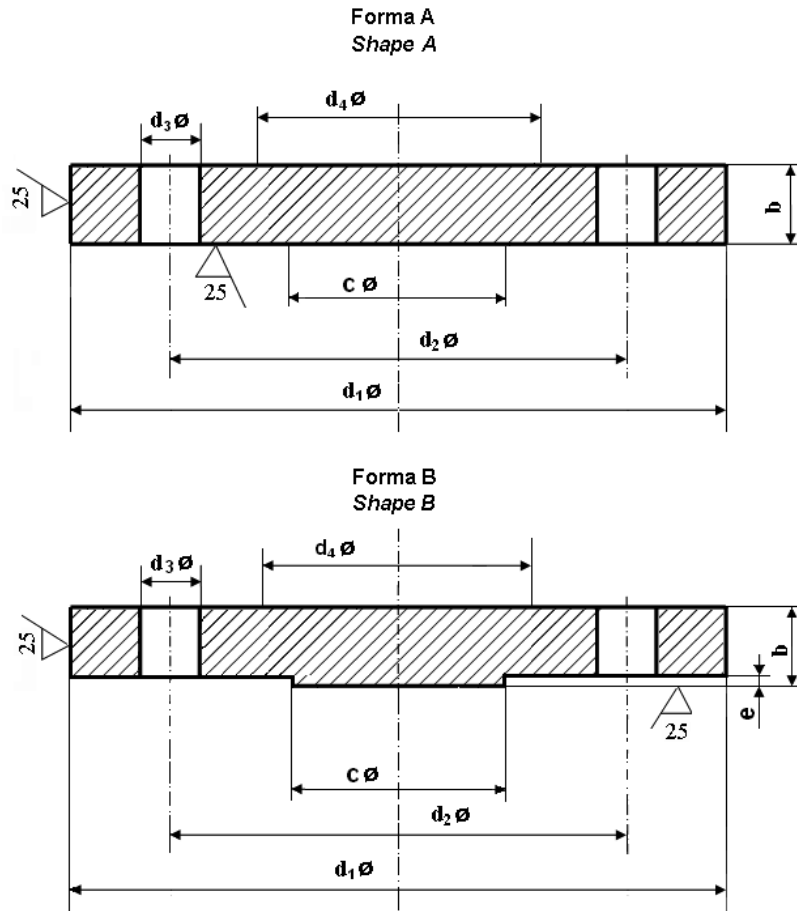
tabel A 4.2.2. table A 4.2.2.

DN mm	Dimensiunile flanseii					Etansare		Suruburi		Masa (kg) (7.85Kg/dm ³)	
	Flange Dimensions					Raised		Screws		Weight (kg) (7.85Kg/dm ³)	
ND mm	d1 mm	d2 mm	d3 mm	d4 max mm	b mm	c max mm	e max mm	buc n	filet thread	Forma A Shape A	Forma B Shape B
10	90	60	14	30	14	-	2	4	M12	0.63	-
15	95	65	14	35	14	-	2	4	M12	0.72	-
20	105	75	14	45	16	-	2	4	M12	1.01	-
25	115	85	14	55	16	-	2	4	M12	1.23	-
32	140	100	18	60	16	-	2	4	M16	1.80	-
40	150	110	18	70	16	-	3	4	M16	2.09	-
50	165	125	18	85	18	-	3	4	M16	2.88	-
65	185	145	18	105	18	55	3	4	M16	3.66	3.70
80	200	160	18	120	20	70	3	8	M16	4.77	4.83
100	220	180	18	140	20	90	3	8	M16	5.65	5.75
125	250	210	18	170	22	115	3	8	M16	8.42	8.59
150	285	240	22	190	22	140	3	8	M20	10.40	10.60
200	340	295	22	245	24	190	3	8	M20	16.30	16.90
250	395	350	22	300	26	235	3	12	M20	24.00	24.70
300	445	400	22	350	26	280	4	12	M20	30.90	34.90
350	505	460	22	410	26	330	4	16	M20	40.60	41.90
400	565	515	26	460	26	380	4	16	M24	49.60	51.20
500	670	620	26	565	28	475	4	20	M24	75.00	77.80

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

4.2.3. Flanse oarbe conform STAS 7451-88 PN 16
Blind Flanges According to STAS 7451-88 NP 16



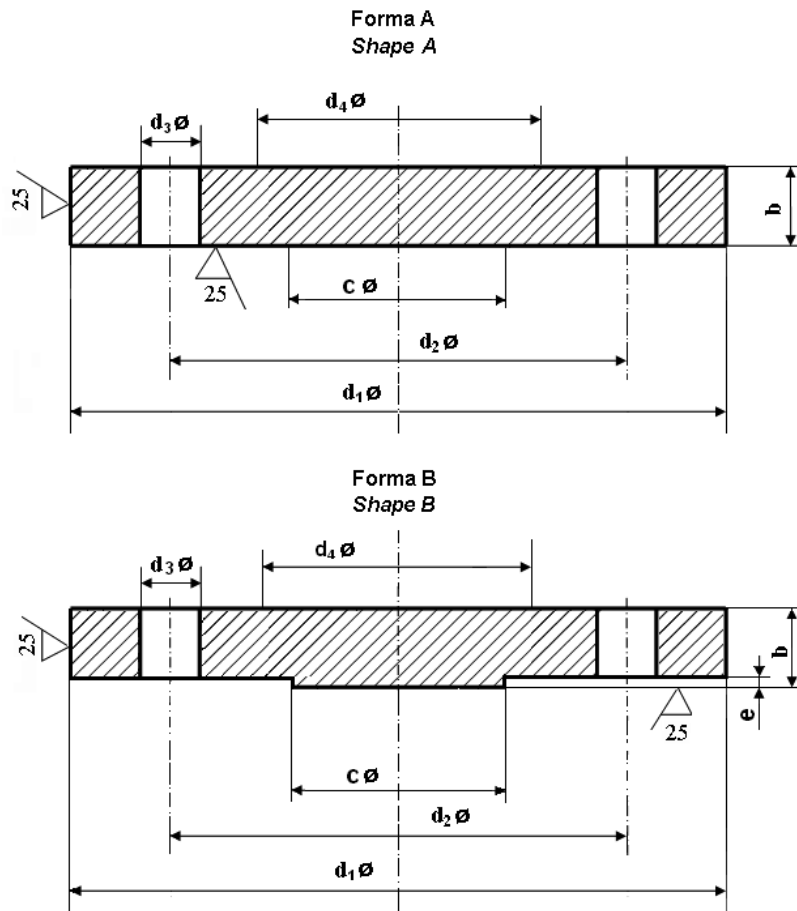
tabel A 4.2.3. table A 4.2.3.

DN mm	Dimensiunile flansei					Etansare		Suruburi		Masa (kg) (7.85Kg/dm3)	
	Flange Dimensions					Raised		Screws		Weight (kg) (7.85Kg/dm3)	
ND mm	d1 mm	d2 mm	d3 mm	d4 max mm	b mm	c max mm	e max mm	buc n	filet thread	Forma A Shape A	Forma B Shape B
10	90	60	14	30	14	-	2	4	M12	0.63	-
15	95	65	14	35	14	-	2	4	M12	0.72	-
20	105	75	14	45	16	-	2	4	M12	1.01	-
25	115	85	14	55	16	-	2	4	M12	1.23	-
32	140	100	18	60	16	-	2	4	M16	1.80	-
40	150	110	18	70	16	-	3	4	M16	2.09	-
50	165	125	18	85	18	-	3	4	M16	2.88	-
65	185	145	18	105	18	55	3	4	M16	3.66	3.70
80	200	160	18	120	20	70	3	8	M16	4.77	4.83
100	220	180	18	140	20	90	3	8	M16	5.65	5.75
125	250	210	18	170	22	115	3	8	M16	8.42	8.59
150	285	240	22	190	22	140	3	8	M20	10.40	10.60
200	340	295	22	245	24	190	3	12	M20	16.10	16.50
250	405	355	26	300	26	235	3	12	M24	24.90	25.60
300	460	410	26	355	28	285	4	12	M24	35.10	36.10
350	520	470	26	415	30	330	4	16	M24	47.80	49.10
400	580	525	30	465	32	380	4	16	M27	63.50	65.30
500	715	650	33	580	36	475	4	20	M30	102.00	105.00

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

4.2.4. Flanse orbe conform STAS 7451-88 PN 25
Blind Flanges According to STAS 7451-88 NP 25



tabel A 4.2.4. table A 4.2.4.

DN mm	Dimensiunile flanseii					Etansare		Suruburi		Masa (kg) (7.85Kg/dm ³)	
	Flange Dimensions					Raised		Screws		Weight (kg) (7.85Kg/dm ³)	
ND mm	d1 mm	d2 mm	d3 mm	d4 max mm	b mm	c max mm	e max mm	buc	filet	Forma A	Forma B
								n	thread	Shape A	Shape B
10	90	60	14	30	16	-	2	8	M12	0.72	-
15	95	65	14	35	16	-	2	8	M12	0.81	-
20	105	75	14	45	18	-	2	8	M12	1.24	-
25	115	85	14	55	18	-	2	8	M12	1.38	-
32	140	100	18	60	18	-	2	8	M16	2.03	-
40	150	110	18	70	18	-	3	8	M16	2.35	-
50	165	125	18	85	20	-	3	4	M16	3.26	-
65	185	145	18	105	22	55	3	8	M16	4.20	4.33
80	200	160	18	120	24	70	3	8	M16	5.88	5.94
100	235	190	22	140	24	90	3	8	M20	7.54	7.64
125	270	220	26	165	26	115	3	8	M24	10.80	11.00
150	300	250	26	195	28	140	3	8	M24	14.50	14.70
200	360	310	26	255	30	190	3	12	M24	22.30	22.70
250	425	370	30	310	32	237	3	12	M27	33.50	34.20
300	485	430	30	370	34	285	4	16	M27	46.30	47.30
350	555	490	33	420	38	332	4	16	M30	68.00	69.30
400	620	550	36	475	40	380	4	16	M33	89.70	91.50
500	730	660	36	585	45	475	4	20	M33	138.00	141.00

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

5. FLANSE CONFORM STANDARDULUI AMERICAN ANSI B16.5 FLANGES ACCORDING TO AMERICAN STANDARD ANSI B16.5

In standardele americane flansele sunt clasificate din punct de vedere al presiunii cu „Class”. Corespondenta intre presiunile flanselor standardelor americane si cele europene sunt convenite de catre ISO 7005-1 astfel:

The American standards flanges are classified in terms of pressure to "Class". Correspondence between flanges pressures U.S. and European standards are agreed by ISO 7005-1 as follows:

Class 150	≈ PN 20bar
Class 300	≈ PN 50bar
Class 600	≈ PN 110bar
Class 900	≈ PN 150bar
Class 1500	≈ PN 260bar
Class 2500	≈ PN 420bar

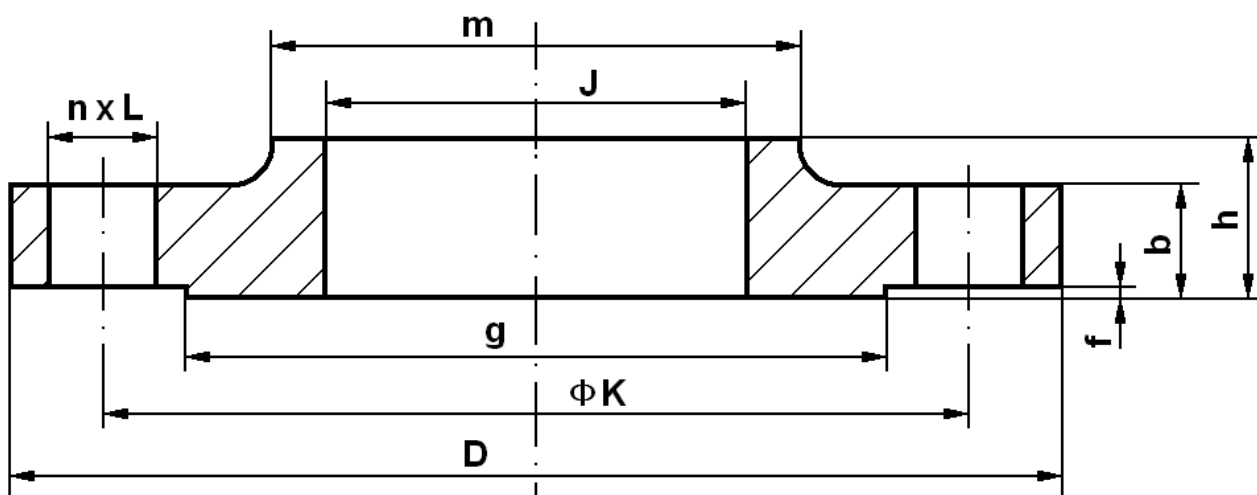
Aceasta este o echivalenta adoptata conventional. Ea nu se regaseste in calculul de transformare a presiunii lbs (libre/ţol²) in bari. Exemplu: 150lbs ≠ 20bar.

This is an equivalent conventionally adopted. It is not recovering in the calculation of the pressure conversion lbs (libre/inch²) in bars. Example: 150lbs ≠ 20bar.

5.1. Flanse slip-on conform standardului american ANSI B16.5 Slip-on Flanges According to American Standard ANSI B16.5

5.1.1. Flanse slip-on conform standardului american ANSI B16.5 clasa 150 Slip-on Flanges According to American Standard ANSI B16.5 Class 150

Class 150 ≈ PN 20bar



tabel A 5.1.1. table A 5.1.1.

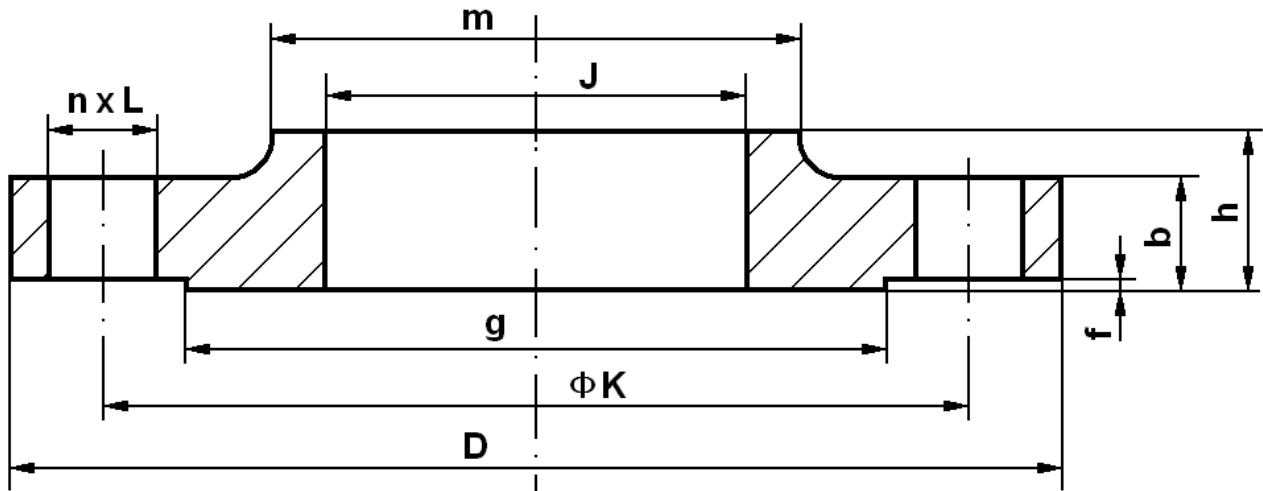
DN toli ND inch	d mm	Dimensiunile flanse Flange Dimensions							Suruburi Screws			Masa (kg) Weight (kg) (7.85Kg/dm ³)
		D mm	J mm	b mm	h mm	m mm	g mm	f mm	n	L mm	K mm	
1/2"	21.3	88.9	22.4	11.2	15.7	30.2	35.1	1.6	4	15.7	60.5	0.39
3/4"	26.7	98.6	27.7	12.7	15.7	38.1	42.9	1.6	4	15.7	69.9	0.56
1"	33.4	108.0	34.5	14.2	17.5	49.3	50.8	1.6	4	15.7	79.2	0.78
1 1/4"	42.2	117.3	43.2	15.7	20.6	58.7	63.5	1.6	4	15.7	88.9	1.03
1 1/2"	48.3	127.0	49.5	17.5	22.4	65.0	73.2	1.6	4	15.7	98.6	1.32
2"	60.3	152.4	62.0	19.1	25.4	77.7	91.9	1.6	4	19.1	120.7	2.06
2 1/2"	73.1	177.8	74.7	22.4	28.4	90.4	104.6	1.6	4	19.1	139.7	3.28
3"	88.9	190.5	90.7	23.9	30.2	108.0	127.0	1.6	4	19.1	152.4	3.85
3 1/2"	101.6	215.9	103.4	23.9	31.8	122.2	139.7	1.6	8	19.1	177.8	4.81
4"	114.3	228.6	116.1	23.9	33.3	134.9	157.2	1.6	8	19.1	190.5	5.30
5"	141.3	254.0	143.8	23.9	36.6	163.6	185.7	1.6	8	22.4	215.9	6.07
6"	168.3	279.4	170.7	25.4	39.6	192.0	215.9	1.6	8	22.4	241.3	7.45
8"	219.1	342.9	221.5	28.4	44.5	246.1	269.7	1.6	8	22.4	298.5	12.10
10"	273	406.4	276.4	30.2	49.3	304.8	323.9	1.6	12	25.4	362.0	16.50
12"	323.8	482.6	327.2	31.8	55.6	365.3	381.0	1.6	12	25.4	431.8	26.20
14"	355.6	533.4	359.2	35.1	57.2	400.1	412.8	1.6	12	28.4	476.3	34.60
16"	406.4	596.9	410.5	36.6	63.5	457.2	469.9	1.6	16	28.4	539.8	44.80
18"	457.2	635.0	461.8	39.6	68.3	505.0	533.4	1.6	16	31.8	577.9	48.90
20"	508	698.5	513.1	42.9	73.2	558.8	584.2	1.6	20	31.8	635.0	61.90
24"	609.6	812.8	616.0	47.8	82.6	663.4	692.2	1.6	20	35.1	749.3	86.90

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

5.1.2. Flanse slip-on conform standardului american ANSI B16.5 clasa 300
Slip-on Flanges According to American Standard ANSI B16.5 Class 300

Class 300 ≈ PN 50bar



tabel A 5.1.2. table A 5.1.2.

DN țoli	d mm	Dimensiunile flanse Flange Dimensions							Suruburi Screws			Masa (kg) Weight (kg)
		D mm	J mm	b mm	h mm	m mm	g mm	f mm	n	L mm	K mm	(7.85Kg/dm ³)
1/2"	21.3	95.2	22.3	14.2	22.3	38.1	35.0	1.6	4	15.7	66.5	0.64
3/4"	26.7	117.3	27.7	15.7	25.4	47.7	42.9	1.6	4	19.0	82.5	1.12
1"	33.4	123.9	34.5	17.5	26.9	53.8	50.8	1.6	4	19.0	88.9	1.36
1 1/4"	42.2	133.3	43.2	19.0	26.9	63.5	63.5	1.6	4	19.0	98.5	1.68
1 1/2"	48.3	155.4	49.5	20.6	30.2	69.8	73.1	1.6	4	22.3	114.3	2.49
2"	60.3	165.1	62.0	22.3	33.2	84.0	91.9	1.6	8	19.0	127.0	2.87
2 1/2"	73.1	190.5	74.7	25.4	38.1	100.0	104.6	1.6	8	22.3	149.3	4.32
3"	88.9	209.5	90.7	28.4	42.9	117.3	127.0	1.6	8	22.3	168.1	5.85
3 1/2"	101.6	228.6	103.4	30.2	44.4	133.3	139.7	1.6	8	22.3	184.1	7.34
4"	114.3	254.0	116.1	31.7	47.7	146.0	157.2	1.6	8	22.3	200.1	9.61
5"	141.3	279.4	143.8	35.0	50.8	177.8	185.6	1.6	8	22.3	234.9	12.30
6"	168.3	317.5	170.7	36.5	52.3	206.3	215.9	1.6	12	22.3	239.7	15.60
8"	219.1	381.0	221.5	41.1	61.9	260.3	269.7	1.6	12	25.4	330.2	24.20
10"	273	444.5	276.3	47.7	66.5	320.5	323.8	1.6	16	28.4	387.3	34.10
12"	323.8	520.7	327.1	50.8	73.1	374.6	381.0	1.6	16	31.7	450.8	49.80
14"	355.6	584.2	359.1	53.8	76.2	425.4	412.7	1.6	20	31.7	514.3	69.90
16"	406.4	647.7	410.5	57.1	82.5	482.6	469.9	1.6	20	35.0	571.5	88.10
18"	457.2	711.2	461.8	60.4	88.9	533.4	533.4	1.6	24	35.0	628.6	109.00
20"	508	774.7	513.1	63.5	95.2	587.2	584.2	1.6	24	35.0	685.8	134.00
24"	609.6	914.4	615.9	69.8	106.4	701.5	692.1	1.6	24	41.1	812.8	201.00

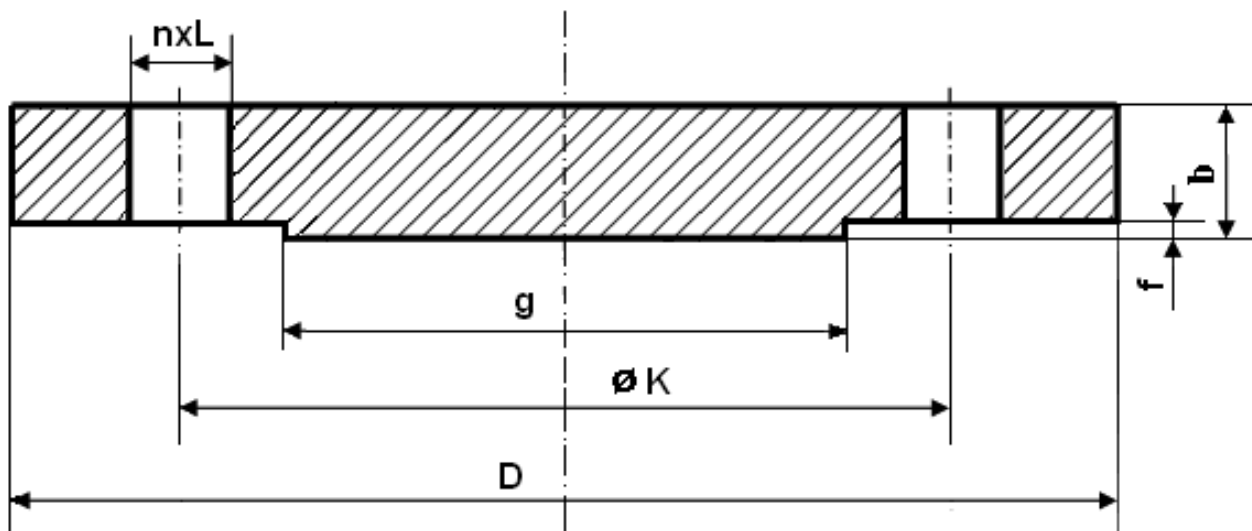
Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

5.2. Flanse oarbe conform standardului american ANSI B16.5 *Blind Flanges According to American Standard ANSI B16.5*

5.2.1. Flanse oarbe conform standardului american ANSI B16.5 clasa 150 *Blind Flanges According to American Standard ANSI B16.5 Class 150*

Class 150 ≈ PN 20bar



tabel A 5.2.1. *table A 5.2.1.*

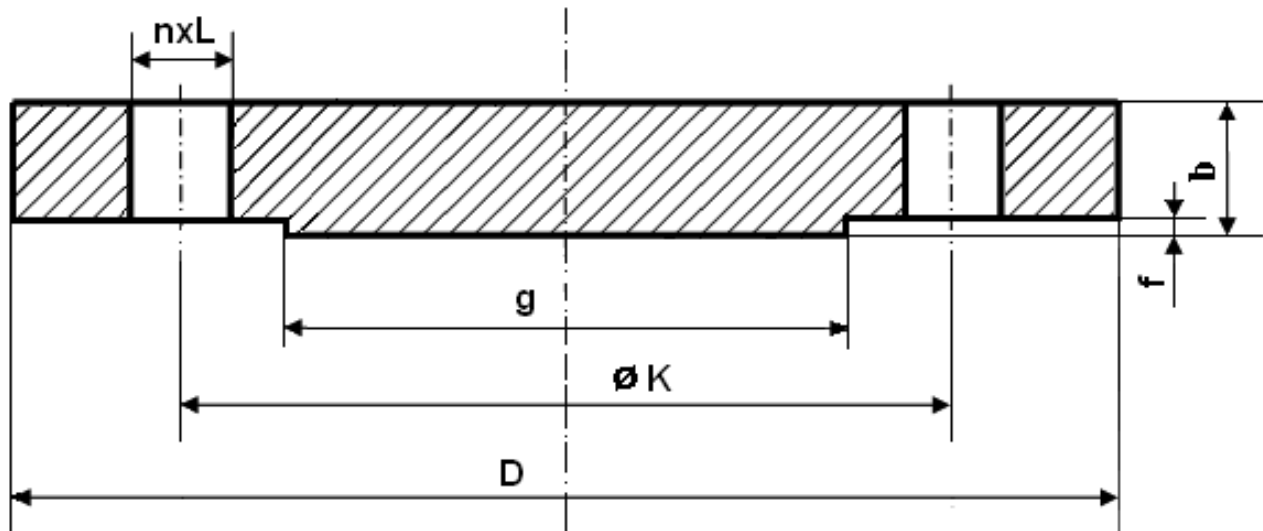
DN toli	d mm	Dimensiunile flanseii <i>Flange Dimensions</i>				Suruburi <i>Screws</i>			Masa (kg) <i>Weight (kg)</i> (7.85Kg/dm ³)
		D mm	b mm	g mm	f mm	n	L mm	K mm	
1/2"	21.3	88.9	11.2	35.1	1.6	4	15.7	60.5	0.42
3/4"	26.7	98.6	12.7	42.9	1.6	4	15.7	69.9	0.61
1"	33.4	108.0	14.2	50.8	1.6	4	15.7	79.2	0.86
1 1/4"	42.2	117.3	15.7	63.5	1.6	4	15.7	88.9	1.17
1 1/2"	48.3	127.0	17.5	73.2	1.6	4	15.7	98.6	1.53
2"	60.3	152.4	19.1	91.9	1.6	4	19.1	120.7	2.42
2 1/2"	73.1	177.8	22.4	104.6	1.6	4	19.1	139.7	3.94
3"	88.9	190.5	23.9	127.0	1.6	4	19.1	152.4	4.93
3 1/2"	101.6	215.9	23.9	139.7	1.6	8	19.1	177.8	6.17
4"	114.3	228.6	23.9	157.2	1.6	8	19.1	190.5	7.00
5"	141.3	254.0	23.9	185.7	1.6	8	22.4	215.9	8.63
6"	168.3	279.4	25.4	215.9	1.6	8	22.4	241.3	11.30
8"	219.1	342.9	28.4	269.7	1.6	8	22.4	298.5	19.60
10"	273	406.4	30.2	323.9	1.6	12	25.4	362.0	28.80
12"	323.8	482.6	31.8	381.0	1.6	12	25.4	431.8	43.20
14"	355.6	533.4	35.1	412.8	1.6	12	28.4	476.3	58.10
16"	406.4	596.9	36.6	469.9	1.6	16	28.4	539.8	76.00
18"	457.2	635.0	39.6	533.4	1.6	16	31.8	577.9	93.70
20"	508	698.5	42.9	584.2	1.6	20	31.8	635.0	122.00
24"	609.6	812.8	47.8	692.2	1.6	20	35.1	749.3	185.00

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

5.2.2. Flanse oarbe conform standardului american ANSI B16.5 clasa 300
Blind Flanges According to American Standard ANSI B16.5 Class 300

Class 300 ≈ PN 50bar



tabel A 5.2.2. table A 5.2.2.

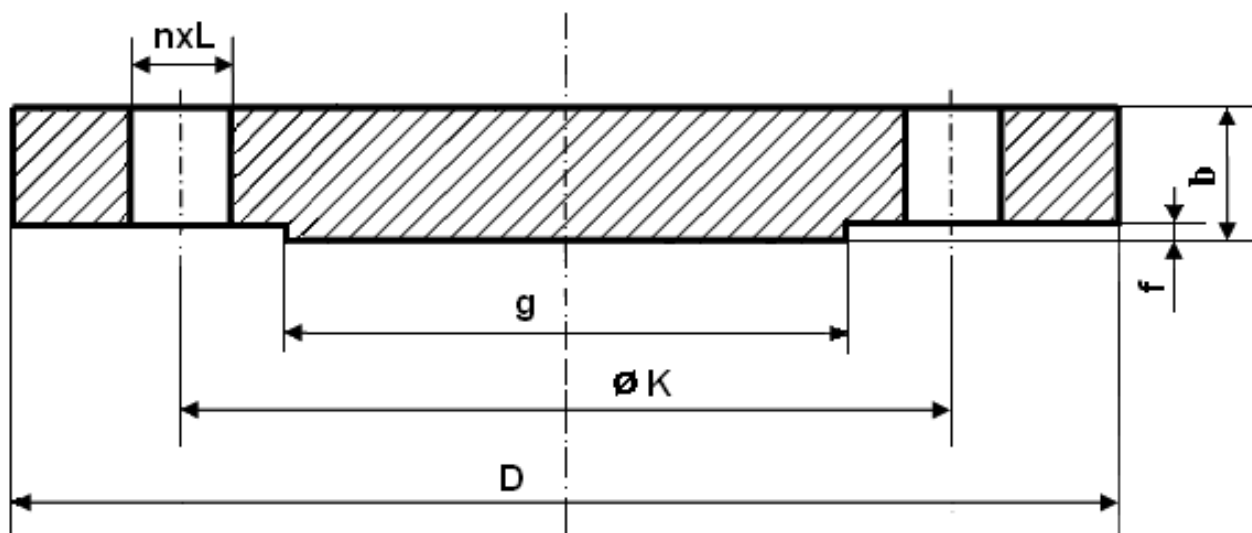
DN toli	d mm	Dimensiunile flanse Flange Dimensions				Suruburi Screws			Masa (kg) Weight (kg) (7.85Kg/dm ³)
		D mm	b mm	g mm	f mm	n	L mm	K mm	
1/2"	21.3	95.2	14.2	35.1	1.6	4	15.7	66.5	0.64
3/4"	26.7	117.3	15.7	42.9	1.6	4	19.0	82.5	1.11
1"	33.4	123.9	17.5	50.8	1.6	4	19.0	88.9	1.39
1 1/4"	42.2	133.3	19.0	63.5	1.6	4	19.0	98.5	1.79
1 1/2"	48.3	155.4	20.6	73.2	1.6	4	22.3	114.3	2.66
2"	60.3	165.1	22.3	91.9	1.6	8	19.0	127.0	3.18
2 1/2"	73.1	190.5	25.4	104.6	1.6	8	22.3	149.3	4.85
3"	88.9	209.5	28.4	127.0	1.6	8	22.3	168.1	6.81
3 1/2"	101.6	228.6	30.2	139.7	1.6	8	22.3	184.1	8.71
4"	114.3	254.0	31.7	157.2	1.6	8	22.3	200.1	11.50
5"	141.3	279.4	35.0	185.7	1.6	8	22.3	234.9	15.60
6"	168.3	317.5	36.5	215.9	1.6	12	22.3	269.7	20.90
8"	219.1	381.0	41.1	269.7	1.6	12	25.4	330.2	34.30
10"	273	444.5	47.7	323.9	1.6	16	28.4	387.3	53.30
12"	323.8	520.7	50.8	381.0	1.6	16	31.7	450.8	78.80
14"	355.6	584.2	53.8	412.8	1.6	20	31.7	514.3	105.00
16"	406.4	647.7	57.1	469.9	1.6	20	35.0	571.5	137.00
18"	457.2	711.2	60.4	533.4	1.6	24	35.0	628.6	175.00
20"	508	774.7	63.5	584.2	1.6	24	35.0	685.8	221.00
24"	609.6	914.4	69.8	692.2	1.6	24	41.1	812.8	339.00

Flansele din oțel carbon sau din inox care nu sunt pe stoc pot fi livrate în 10-15 zile de la comandă.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

5.2.3. Flanse orbe conform standardului american ANSI B16.5 clasa 600
Blind Flanges According to American Standard ANSI B16.5 Class 600

Class 600 ≈ PN 110bar



tabel A 5.2.3. table A 5.2.3.

DN țoli	d mm	Dimensiunile flanse Flange Dimensions				Suruburi Screws			Masa (kg) Weight (kg) (7.85Kg/dm ³)
		D mm	b mm	g mm	f mm	n	L mm	K mm	
1/2"	21.3	95.3	14.2	35.1	6.4	4	15.7	66.5	0.76
3/4"	26.7	117.3	15.7	42.9	6.4	4	19.1	82.6	1.28
1"	33.4	124.0	17.5	50.8	6.4	4	19.1	88.9	1.60
1 1/4"	42.2	133.4	20.6	63.5	6.4	4	19.1	98.6	2.23
1 1/2"	48.3	155.4	22.4	73.2	6.4	4	22.4	114.3	3.25
2"	60.3	165.1	25.4	91.9	6.4	8	19.1	127.0	4.15
2 1/2"	73.1	190.5	28.4	104.6	6.4	8	22.4	149.4	6.13
3"	88.9	209.6	31.8	127.0	6.4	8	22.4	168.1	8.44
3 1/2"	101.6	228.6	35.1	139.7	6.4	8	25.4	184.2	11.00
4"	114.3	273.1	38.1	157.2	6.4	8	25.4	215.9	17.30
5"	141.3	330.2	44.5	185.7	6.4	8	28.4	266.7	29.40
6"	168.3	355.6	47.8	215.9	6.4	12	28.4	292.1	36.10
8"	219.1	419.1	55.6	269.7	6.4	12	31.8	349.3	58.90
10"	273	508.0	63.5	323.9	6.4	16	31.1	431.8	97.50
12"	323.8	558.8	66.5	381.0	6.4	20	35.1	489.0	124.00
14"	355.6	603.3	69.9	412.8	6.4	20	38.1	527.1	151.00
16"	406.4	685.8	76.2	469.9	6.4	20	41.1	603.3	214.00
18"	457.2	743.0	82.6	533.4	6.4	20	44.5	654.1	272.00
20"	508	812.8	88.9	584.2	6.4	24	44.5	723.9	349.00
24"	609.6	939.8	101.6	692.2	6.4	24	50.8	838.2	533.00

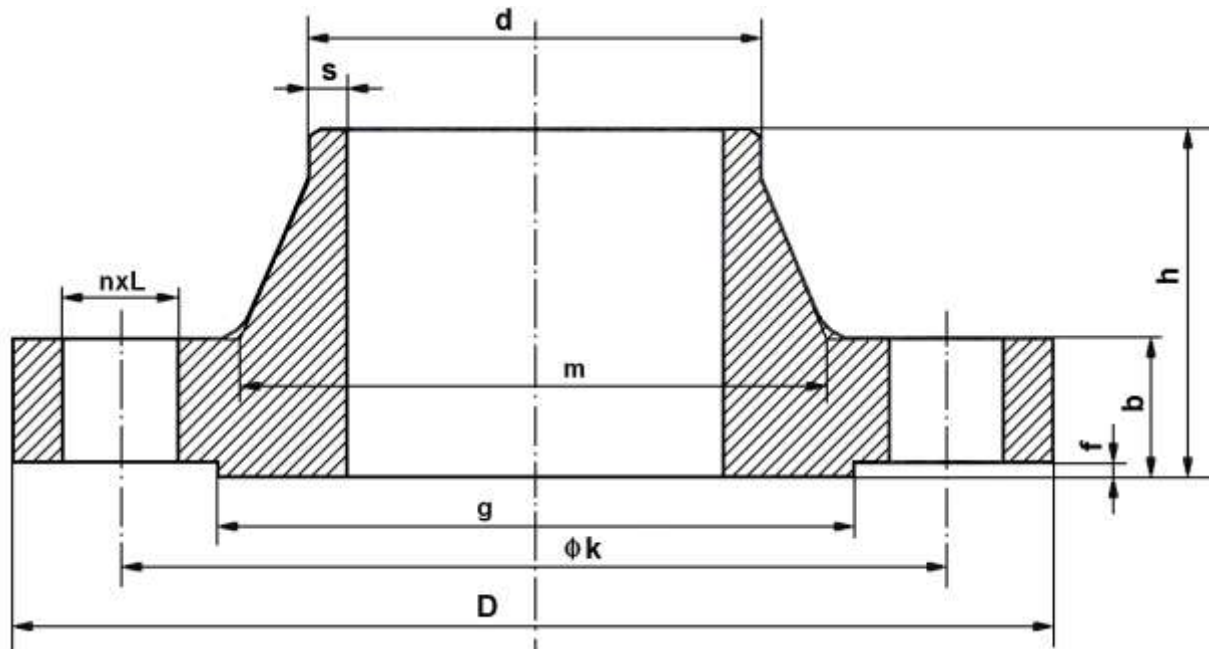
Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

5.3. Flanse cu gat conform standardului american ANSI B16.5 Welding Neck Flanges According to American Standard ANSI B16.5

5.3.1. Flanse cu gat conform standardului american ANSI B16.5 clasa 150 Welding Neck Flanges According to American Standard ANSI B16.5 Class 150

Class 150 ≈ PN 20bar



tabel A 5.3.1. table A 5.3.1.

DN toli ND inch	d mm	Dimensiunile flansei Flange Dimensions							Suruburi Screws			Masa (kg) Weight (kg) (7.85Kg/dm3)
		D mm	s mm	b mm	h mm	m mm	g mm	f mm	n	L mm	K mm	
1/2"	21.3	88.9	2.80	11.2	47.8	30.2	35.1	1.6	4	15.7	60.5	0.48
3/4"	26.7	98.6	2.95	12.7	52.3	38.1	42.9	1.6	4	15.7	69.9	0.71
1"	33.4	108.0	3.40	14.2	55.6	49.3	50.8	1.6	4	15.7	79.2	1.01
1 1/4"	42.2	117.3	3.55	15.7	57.2	58.7	63.5	1.6	4	15.7	88.9	1.33
1 1/2"	48.3	127.0	3.70	17.5	62.0	65.0	73.2	1.6	4	15.7	98.6	1.72
2"	60.3	152.4	3.95	19.1	63.5	77.7	91.9	1.6	4	19.1	120.7	2.58
2 1/2"	73.1	177.8	5.25	22.4	69.9	90.4	104.6	1.6	4	19.1	139.7	4.11
3"	88.9	190.5	5.45	23.9	69.9	108.0	127.0	1.6	4	19.1	152.4	4.92
3 1/2"	101.6	215.9	5.70	23.9	71.4	122.2	139.7	1.6	8	19.1	177.8	6.08
4"	114.3	228.6	5.95	23.9	76.2	134.9	157.2	1.6	8	19.1	190.5	6.84
5"	141.3	254.0	6.95	23.9	88.9	163.6	185.7	1.6	8	22.4	215.9	8.56
6"	168.3	279.4	7.10	25.4	88.9	192.0	215.9	1.6	8	22.4	241.3	10.60
8"	219.1	342.9	8.25	28.4	101.6	246.1	269.7	1.6	8	22.4	298.5	17.60
10"	273	406.4	9.30	30.4	101.6	304.8	323.9	1.6	12	25.4	362.0	24.00
12"	323.8	482.6	9.55	31.8	114.3	365.3	381.0	1.6	12	25.4	431.8	36.50
14"	355.6	533.4	*	35.1	127.0	400.1	412.8	1.6	12	28.4	476.3	48.40
16"	406.4	596.9	*	36.6	127.0	457.2	469.9	1.6	16	28.4	539.8	60.60
18"	457.2	636.0	*	39.6	139.7	505.0	533.4	1.6	16	31.8	577.9	68.30
20"	508	698.5	*	42.9	144.5	558.8	584.2	1.6	20	31.8	635.0	84.50
24"	609.6	812.8	*	47.8	152.4	663.4	692.2	1.6	20	35.1	749.3	115.00

* Vor fi stabilite impreuna cu clientul.

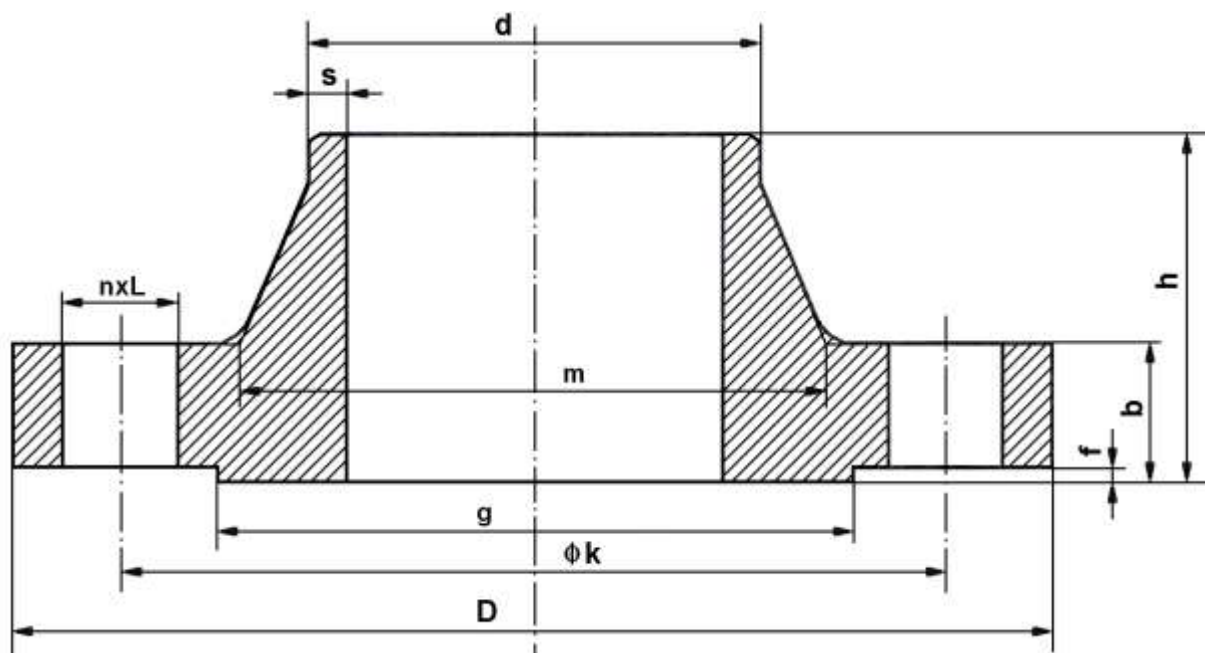
* Shall be agreed with the purchaser.

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

5.3.2. Flanse cu gat conform standardului american ANSI B16.5 clasa 300
Welding Neck Flanges According to American Standard ANSI B16.5 Class 300

Class 300 ≈ PN 50bar



tabel A 5.3.2. table A 5.3.2.

DN toli	d mm	Dimensiunile flanse Flange Dimensions							Suruburi Screws			Masa (kg) Weight (kg)
		D mm	s mm	b mm	h mm	m mm	g mm	f mm	n	L mm	K mm	(7.85Kg/dm ³)
1/2"	21.3	95.2	2.80	14.2	52.3	38.1	35.0	1.6	4	15.7	66.5	0.75
3/4"	26.7	117.3	2.95	15.7	57.1	47.7	42.9	1.6	4	19.0	82.5	1.26
1"	33.4	123.9	3.40	17.5	62.0	53.8	50.8	1.6	4	19.0	88.9	1.52
1 1/4"	42.2	133.3	3.55	19.0	65.0	63.5	63.5	1.6	4	19.0	98.5	2.03
1 1/2"	48.3	155.4	3.70	20.6	68.3	69.8	73.1	1.6	4	22.3	114.3	2.89
2"	60.3	165.1	3.90	22.3	69.8	84.0	91.9	1.6	8	19.0	127.0	3.40
2 1/2"	73.1	190.5	5.20	25.4	76.2	100.0	104.6	1.6	8	22.3	149.3	5.17
3"	88.9	209.5	5.45	28.4	79.2	117.3	127.0	1.6	8	22.3	168.1	6.93
3 1/2"	101.6	228.6	5.70	30.2	81.0	133.3	139.7	1.6	8	22.3	184.1	8.67
4"	114.3	254.0	5.95	31.7	85.8	146.0	157.2	1.6	8	22.3	200.1	11.20
5"	141.3	279.4	6.45	35.0	98.5	177.8	185.6	1.6	8	22.3	234.9	15.10
6"	168.3	217.5	7.10	36.5	98.5	206.2	215.9	1.6	12	22.3	269.7	19.10
8"	219.1	381.0	8.25	41.1	111.2	260.3	269.7	1.6	12	25.4	330.2	29.90
10"	273	444.5	9.25	47.7	117.3	320.5	323.8	1.6	16	28.4	387.3	42.70
12"	323.8	520.7	9.50	50.8	130.0	374.6	381.0	1.6	16	31.7	450.8	61.80
14"	355.6	584.2	*	53.8	142.7	425.4	412.7	1.6	20	31.7	514.3	85.80
16"	406.4	647.7	*	57.1	146.0	482.6	469.9	1.6	20	35.0	571.5	106.00
18"	457.2	711.2	*	60.4	158.7	533.4	533.4	1.6	24	35.0	628.6	131.00
20"	508	774.7	*	63.5	162.0	587.2	584.2	1.6	24	35.0	685.8	158.00
24"	609.6	914.4	*	69.8	168.1	701.5	692.1	1.6	24	41.1	812.8	230.00

* Vor fi stabilite impreuna cu clientul

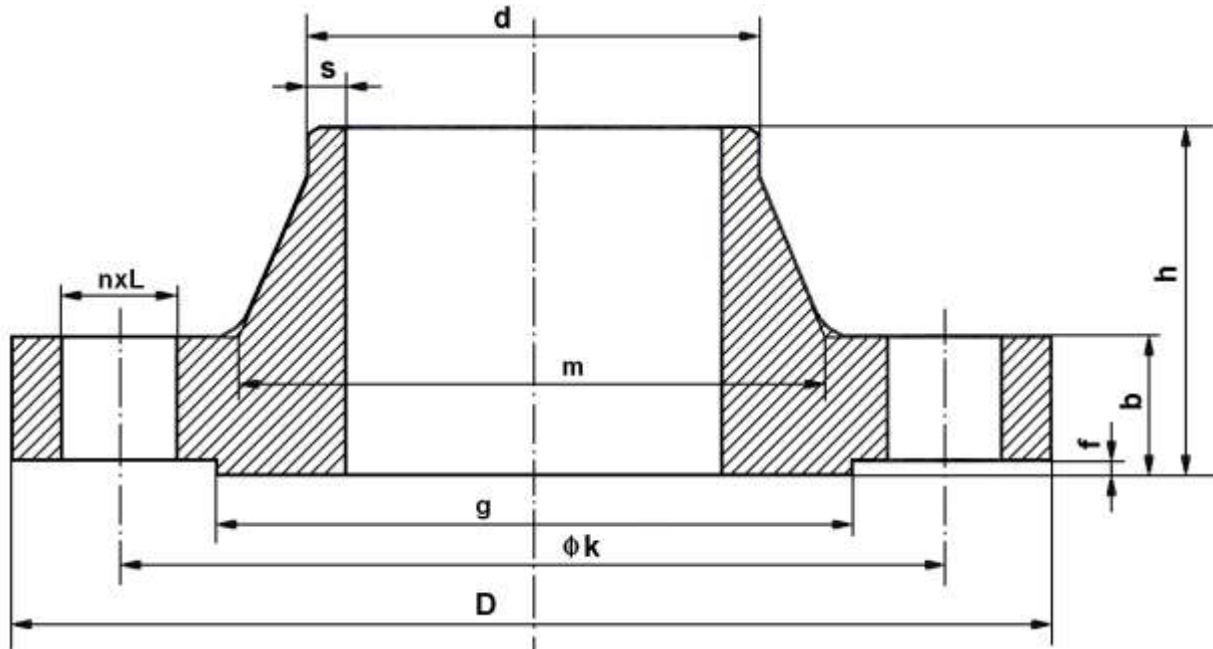
* Shall be agreed with the purchaser

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

5.3.3. Flanse cu gat conform standardului american ANSI B16.5 clasa 600
Welding Neck Flanges According to American Standard ANSI B16.5 Class 600

Class 600 ≈ PN 110bar



tabel A 5.3.3. table A 5.3.3.

DN țoli ND inch	d mm	Dimensiunile flansei Flange Dimensions							Suruburi Screws			Masa (kg) Weight (kg) (7.85Kg/dm3)
		D mm	s mm	b mm	h mm	m mm	g mm	f mm	n	L mm	K mm	
1/2"	21.3	95.3	*	20.6	58.7	38.1	35.1	6.4	4	15.7	66.5	0.87
3/4"	26.7	117.3	*	22.1	63.6	47.8	42.9	6.4	4	19.1	82.6	1.45
1"	33.4	124.0	*	23.9	68.4	53.8	50.8	6.4	4	19.1	88.9	1.76
1 1/4"	42.2	133.4	*	27	72.9	63.5	63.5	6.4	4	19.1	98.6	2.49
1 1/2"	48.3	155.4	*	28.8	76.3	69.9	73.2	6.4	4	22.4	114.3	3.49
2"	60.3	165.1	*	31.8	79.6	84.1	91.9	6.4	8	19.1	127.0	4.36
2 1/2"	73.1	190.5	*	34.8	85.6	101.1	104.6	6.4	8	22.4	149.4	6.43
3"	88.9	209.6	*	38.2	89	117.3	127.0	6.4	8	22.4	168.1	8.53
3 1/2"	101.6	228.6	*	41.5	92.3	133.4	139.7	6.4	8	25.4	184.2	10.70
4"	114.3	273.1	*	44.5	108	152.4	157.2	6.4	8	25.4	215.9	17.40
5"	141.3	330.2	*	50.9	120.7	189.0	185.7	6.4	8	28.4	266.7	29.20
6"	168.3	355.6	*	54.2	123.7	222.3	215.9	6.4	12	28.4	292.1	34.90
8"	219.1	419.1	*	62	139.8	273.1	269.7	6.4	12	31.8	349.3	53.90
10"	273	508.0	*	69.9	158.8	342.9	323.9	6.4	16	35.1	431.8	86.50
12"	323.8	558.8	*	72.9	161.8	400.1	381.0	6.4	20	35.1	489.0	103.00
14"	355.6	603.3	*	76.3	171.5	431.8	412.8	6.4	20	38.1	527.1	122.00
16"	406.4	685.8	*	82.6	184.2	495.3	469.9	6.4	20	41.1	603.3	170.00
18"	457.2	743.0	*	89	190.6	546.1	533.4	6.4	20	44.5	654.1	204.00
20"	508	812.8	*	95.3	196.9	609.6	584.2	6.4	24	44.5	723.9	254.00
24"	609.6	939.8	*	108	209.6	717.6	692.2	6.4	24	50.8	838.2	358.00

* Vor fi stabilite impreuna cu clientul

* Shall be agreed with the purchaser

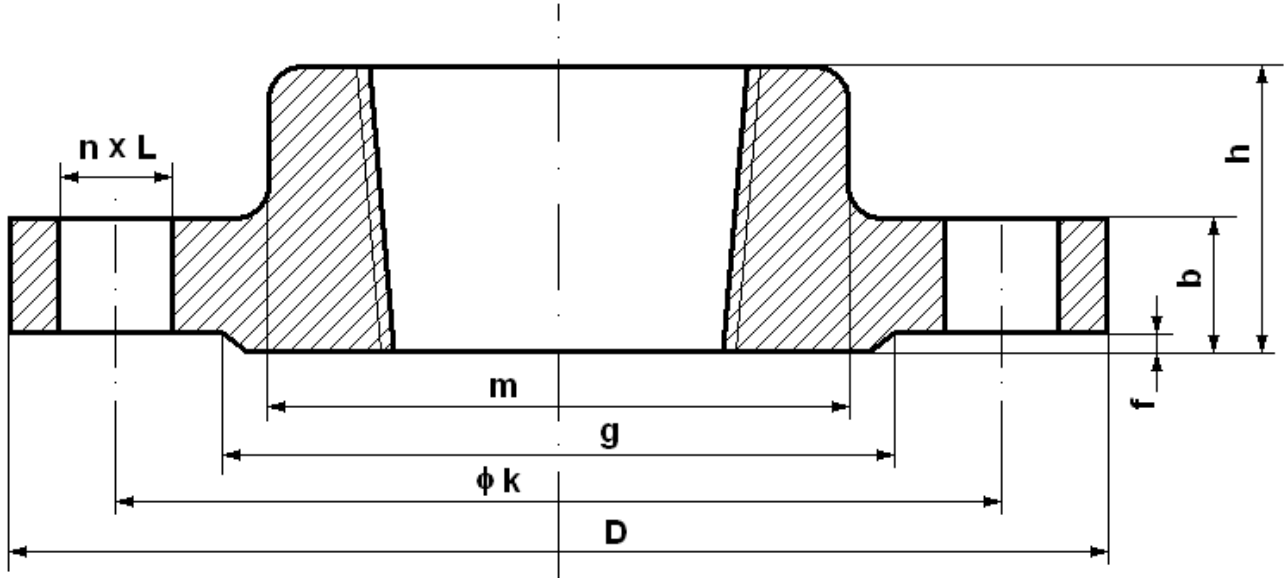
Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

5.4. Flanse filetate conform standardului american ANSI B16.5 Threaded Flanges According to American Standard ANSI B16.5

5.4.1. Flanse filetate conform standardului american ANSI B16.5 clasa 150 Threaded Flanges According to American Standard ANSI B16.5 Class 150

Class 150 ≈ PN 20bar



tabel A 5.4.1. table A 5.4.1.

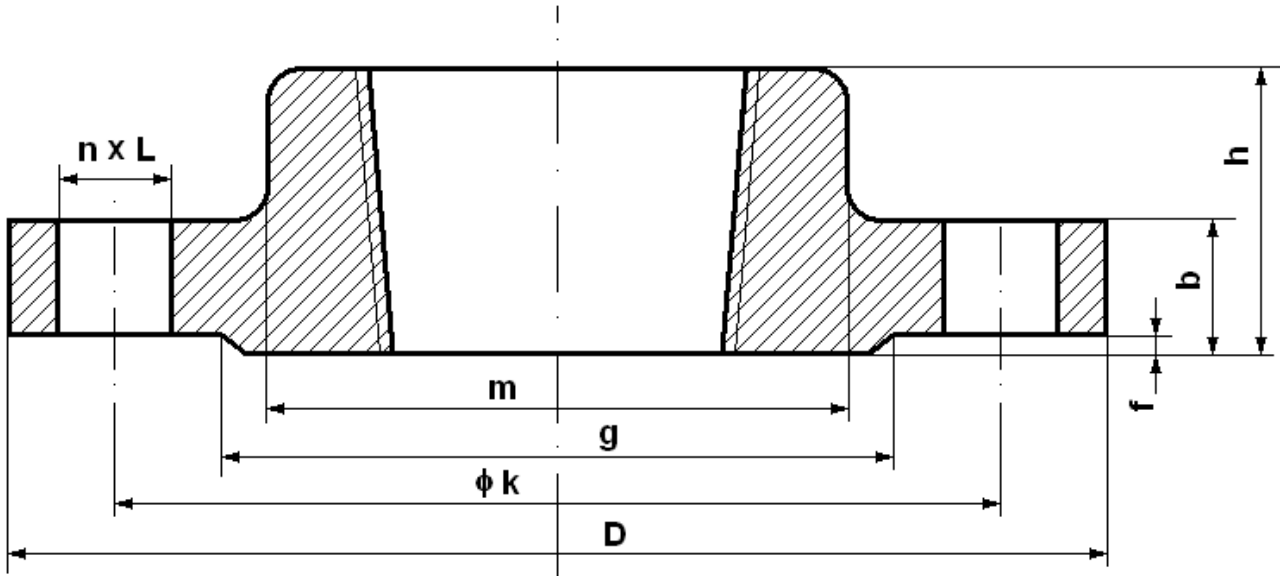
DN toli ND inch	d mm	Dimensiunile flanse Flange Dimensions				Filet Thread toli (") inch (")	Etansare Raised		Suruburi Screws			Masa (kg) Weight (kg) (7.85Kg/dm ³)
		D mm	b mm	h mm	m mm		g mm	f mm	n	L mm	K mm	
1/2"	21.3	88.9	11.2	47.8	30.2	R 1/2	35.1	1.6	4	15.7	60.5	0.4
3/4"	26.7	98.6	12.7	52.3	38.1	R 3/4	42.9	1.6	4	15.7	69.9	0.7
1"	33.4	108.0	14.2	55.6	49.3	R 1	50.8	1.6	4	15.7	79.2	0.9
1 1/4"	42.2	117.3	15.7	57.2	58.7	R 1 1/4	63.5	1.6	4	15.7	88.9	1.2
1 1/2"	48.3	127.0	17.5	62.0	65.0	R 1 1/2	73.2	1.6	4	15.7	98.6	1.5
2"	60.3	152.4	19.1	63.5	77.7	R 2	91.9	1.6	4	19.1	120.7	2.3
2 1/2"	73.1	177.8	22.4	69.9	90.4	R 2 1/2	104.6	1.6	4	19.1	139.7	3.7
3"	88.9	190.5	23.9	69.9	108.0	R 3	127.0	1.6	4	19.1	152.4	4.2
3 1/2"	101.6	215.9	23.9	71.4	122.2	R 3	139.7	1.6	8	19.1	177.8	5.3
4"	114.3	228.6	23.9	76.2	134.9	R 4 1/2	157.2	1.6	8	19.1	190.5	5.9
5"	141.3	254.0	23.9	88.9	163.6	R 5	185.7	1.6	8	22.4	215.9	7
6"	168.3	279.4	25.4	88.9	192.0	R 6	215.9	1.6	8	22.4	241.3	8.4
8"	219.1	342.9	28.4	101.6	246.1	R 8	269.7	1.6	8	22.4	298.5	13
10"	273	406.4	30.4	101.6	304.8	R 10	323.9	1.6	12	25.4	362.0	17.8
12"	323.8	482.6	31.8	114.3	365.3	R 12	381.0	1.6	12	25.4	431.8	29.5
14"	355.6	533.4	35.1	127.0	400.1	R 14	412.8	1.6	12	28.4	476.3	39
16"	406.4	596.9	36.6	127.0	457.2	R 16	469.9	1.6	16	28.4	539.8	42
18"	457.2	636.0	39.6	139.7	505.0	R 18	533.4	1.6	16	31.8	577.9	54
20"	508	698.5	42.9	144.5	558.8	R 20	584.2	1.6	20	31.8	635.0	68
24"	609.6	812.8	47.8	152.4	663.4	R 24	692.2	1.6	20	35.1	749.3	93

Flansele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

5.4.2. Flanse filetate conform standardului american ANSI B16.5 clasa 300
Threaded Flanges According to American Standard ANSI B16.5 Class 300

Class 300 ≈ PN 50bar



tabel A 5.4.2. table A 5.4.2.

DN țoli ND inch	d mm	Dimensiunile flanse Flange Dimensions				Filet Thread țoli (") inch (")	Etansare Raised		Suruburi Screws			Masa (kg) Weight (kg) (7.85Kg/dm ³)
		D mm	b mm	h mm	m mm		g mm	f mm	n	L mm	K mm	
1/2"	21.3	95.2	14.2	52.3	38.1	R 1/2	35.0	1.6	4	15.7	66.5	0.7
3/4"	26.7	117.3	15.7	57.1	47.7	R 3/4	42.9	1.6	4	19.0	82.5	1.2
1"	33.4	123.9	17.5	62.0	53.8	R 1	50.8	1.6	4	19.0	88.9	1.4
1 1/4"	42.2	133.3	19.0	65.0	63.5	R 1 1/4	63.5	1.6	4	19.0	98.5	1.9
1 1/2"	48.3	155.4	20.6	68.3	69.8	R 1 1/2	73.1	1.6	4	22.3	114.3	2.8
2"	60.3	165.1	22.3	69.8	84.0	R 2	91.9	1.6	8	19.0	127.0	3.3
2 1/2"	73.1	190.5	25.4	76.2	100.0	R 2 1/2	104.6	1.6	8	22.3	149.3	4.6
3"	88.9	209.5	28.4	79.2	117.3	R 3	127.0	1.6	8	22.3	168.1	6.3
3 1/2"	101.6	228.6	30.2	81.0	133.3	R 3	139.7	1.6	8	22.3	184.1	7.8
4"	114.3	254.0	31.7	85.8	146.0	R 4 1/2	157.2	1.6	8	22.3	200.1	10.2
5"	141.3	279.4	35.0	98.5	177.8	R 5	185.6	1.6	8	22.3	234.9	12.9
6"	168.3	217.5	36.5	98.5	206.2	R 6	215.9	1.6	12	22.3	269.7	18
8"	219.1	381.0	41.1	111.2	260.3	R 8	269.7	1.6	12	25.4	330.2	26
10"	273	444.5	47.7	117.3	320.5	R 10	323.8	1.6	16	28.4	387.3	37.5
12"	323.8	520.7	50.8	130.0	374.6	R 12	381.0	1.6	16	31.7	450.8	52
14"	355.6	584.2	53.8	142.7	425.4	R 14	412.7	1.6	20	31.7	514.3	72
16"	406.4	647.7	57.1	146.0	482.6	R 16	469.9	1.6	20	35.0	571.5	100
18"	457.2	711.2	60.4	158.7	533.4	R 18	533.4	1.6	24	35.0	628.6	126
20"	508	774.7	63.5	162.0	587.2	R 20	584.2	1.6	24	35.0	685.8	148
24"	609.6	914.4	69.8	168.1	701.5	R 24	692.1	1.6	24	41.1	812.8	222

Flansele din oțel carbon sau din inox care nu sunt pe stoc pot fi livrate în 10-15 zile de la comanda.

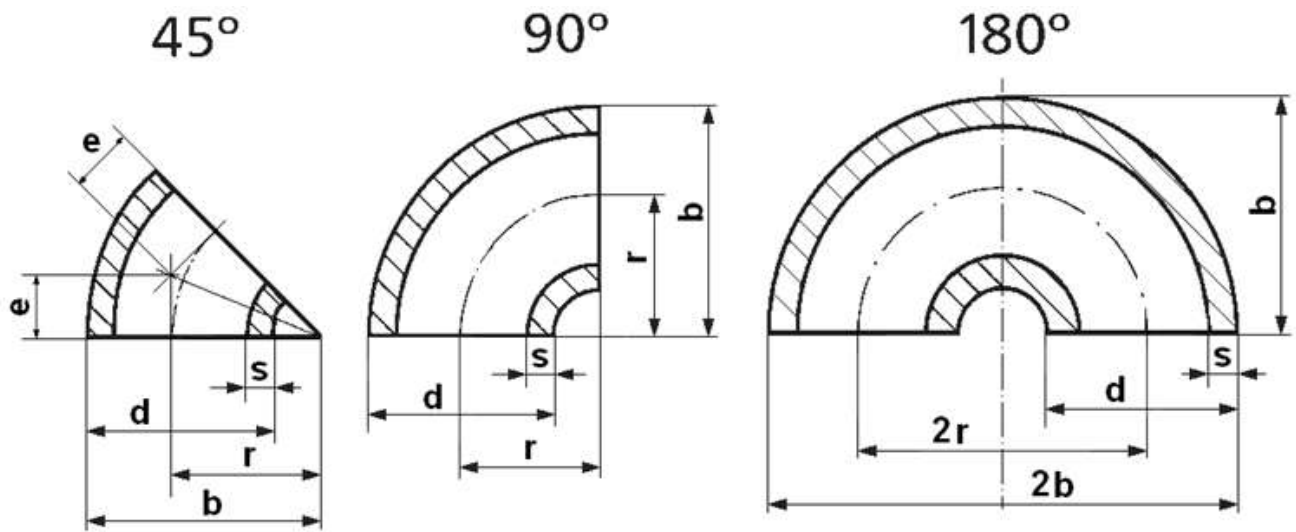
Flanges from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

**B. FITINGURI PENTRU
SUDURA**

***BUTT WELDING PIPE
FITTINGS***

1. Fitinguri pentru sudura conform standardelor germane *Butt Welding Pipe Fittings According to German Standards*

1.1. Coturi pentru sudura conform standardului german DIN 2605-1 *Butt Weld Elbows According to German Standard DIN 2605-1*



Coturile prezentate au destinația de a fi imbinate prin sudura cap la cap de tubulatură. Ele pot fi, prin construcție, sudate sau din teava trasa, din oțel carbon sau oțel inox.

These elbows are intended to be butt welded to pipes. They can be welded or seamless, from carbon steel or stainless steel.

Standarde de referință *Relative standards*

DIN 2448 Tevi și tuburi trase din oțel; dimensiuni și mase pe unitatea de lungime
Seamless steel pipes and tubes; size and mass per unit length

DIN 2458 Tevi și tuburi sudate din oțel; dimensiuni și mase
Welded steel pipes and tubes; size and mass

DIN 2609 Fitinguri din oțel pentru sudura cap la cap; condiții tehnice de livrare
Steel butt-welding pipe fittings; technical delivery conditions

„r” se va aproxima astfel:

tip 2	$r \cong 1d$
tip 3	$r \cong 1.5d$
tip 5	$r \cong 2.5d$
tip 10	$r \cong 5.0d$
tip 20	$r \cong 10.0d$

„r” is to be calculate as follow:

type 2	$r \cong 1d$
type 3	$r \cong 1.5d$
type 5	$r \cong 2.5d$
type 10	$r \cong 5.0d$
type 20	$r \cong 10.0d$

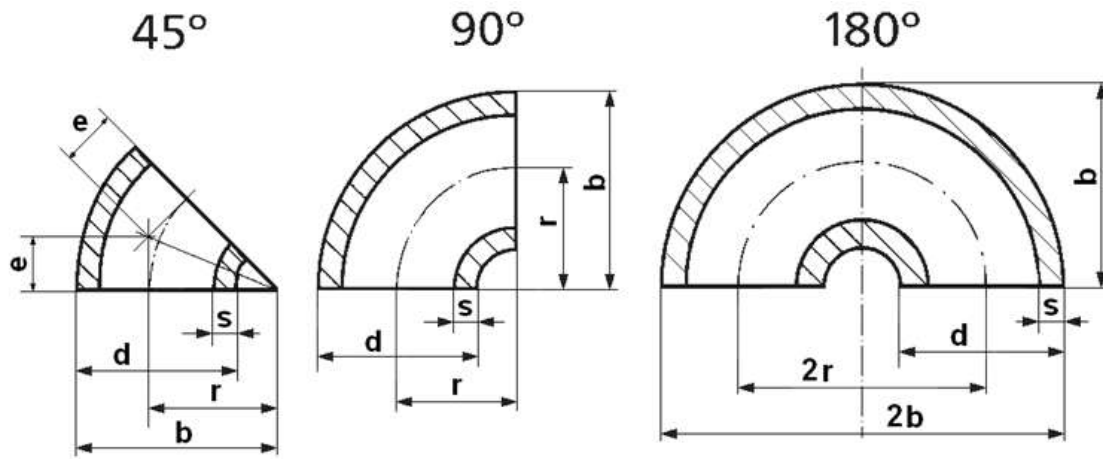
În calculul masei cotelui tras, se ia ca bază teava de origine, un tub a cărei înălțime se considera a fi lungimea arcului de cerc de rază „r”. Astfel masa cotelui de 90° va fi:

The mass calculation of elbows from seamless pipe begin from the pipe of origin. This pipe have the height equal to the length of the arc of circle with radius „r”. Then mass of 90° elbow will be:

$$m = \frac{\pi}{4} [d^2 - (d - 2s)^2] \times \frac{2\pi \cdot r}{4} \times 7.85 \times 10^{-6} \text{ kg}$$

$$m = \frac{\pi^2 r s (d - s)}{2} \times 7.85 \times 10^{-6} \text{ kg}$$

Masele cotelor de 45°, 60° și 180° vor fi ușor de calculat înmulțind masa cotelui de 90° cu 1/2, 2/3, și respectiv 2.
The mass of 45°, 60° and 180° elbows will be easy calculate multiplying mass of 90° elbow with 1/2, 2/3, and respectively 2.



tabel B 1.1. table B 1.1.

DN	d mm	Tip	r mm	b mm	e mm	Seria 1		Seria 2		Seria 3		Seria 4		Seria 5			
						Series 1		Series 2		Series 3		Series 4		Series 5			
						s mm	masa	s mm	masa	s mm	masa	s mm	masa	s mm	masa	s mm	masa
							weight		weight		weight		weight		weight		weight
ND mm	Type	kg	kg	kg	kg	kg	kg	kg	kg								
15	21.3	2	≈1d	17.5	28	7	0.02	-	-	-	-	-	-	-	-		
		3	≈1.5d	28.0	38	12	0.03	-	-	-	-	-	-	-	-		
		5	≈2.5d	42.5	53	18	0.05	-	-	-	-	-	-	-	-		
20	26.9	2	≈1d	25.0	39	10	0.04	-	-	-	-	-	-	-	-		
		3	≈1.5d	29.0	43	12	0.05	-	-	-	-	-	-	-	-		
		5	≈2.5d	57.5	71	24	0.09	-	-	-	-	-	-	-	-		
25	33.7	2	≈1d	25.0	42	10	0.06	-	-	-	-	-	-	-	-		
		3	≈1.5d	38.0	56	16	0.09	-	-	-	-	-	-	-	-		
		5	≈2.5d	72.5	90	30	0.18	-	-	-	-	-	-	-	-		
32	42.4	2	≈1d	32.0	53	13	0.10	-	-	-	-	-	-	-	-		
		3	≈1.5d	48.0	69	20	0.15	-	-	-	-	-	-	-	-		
		5	≈2.5d	92.5	114	38	0.29	-	-	-	-	-	-	-	-		
40	48.3	2	≈1d	38.0	62	16	0.14	-	-	-	-	-	-	-	-		
		3	≈1.5d	57.0	82	24	0.20	-	-	-	-	-	-	-	-		
		5	≈2.5d	107.5	132	45	0.39	-	-	-	-	-	-	-	-		
50	60.3	2	≈1d	51	81	21	0.23	-	-	-	-	-	-	-	-		
		3	≈1.5d	76	106	32	0.34	-	-	-	-	-	-	-	-		
		5	≈2.5d	135	165	55	0.61	-	-	-	-	-	-	-	-		
		10	≈5d	254	284	105	1.15	-	-	-	-	-	-	-	-		
		20	≈10d	508	538	210	2.29	-	-	-	-	-	-	-	-		
65	76.1	2	≈1d	63	102	26	0.41	-	-	-	-	-	-	-	-		
		3	≈1.5d	95	133	39	0.62	-	-	-	-	-	-	-	-		
		5	≈2.5d	175	213	73	1.15	-	-	-	-	-	-	-	-		
		10	≈5d	318	356	132	2.09	-	-	-	-	-	-	-	-		
		20	≈10d	635	673	263	4.18	-	-	-	-	-	-	-	-		
80	88.9	2	≈1d	76	121	32	0.59	-	-	-	-	-	-	-	-		
		3	≈1.5d	114	159	47	0.88	-	-	-	-	-	-	-	-		
		5	≈2.5d	205	250	85	1.58	-	-	-	-	-	-	-	-		
		10	≈5d	381	425	158	2.94	-	-	-	-	-	-	-	-		
		20	≈10d	762	806	316	5.88	-	-	-	-	-	-	-	-		
100	114.3	2	≈1d	102	159	42	1.15	-	-	-	-	-	-	-	-		
		3	≈1.5d	152	210	63	1.71	-	-	-	-	-	-	-	-		
		5	≈2.5d	270	327	112	3.04	-	-	-	-	-	-	-	-		
		10	≈5d	508	565	210	5.72	-	-	-	-	-	-	-	-		
		20	≈10d	1016	1073	421	11.43	-	-	-	-	-	-	-	-		

tabel B 1.1. (Continuare) table B 1.1. (Continued)

DN	d mm	Tip		r mm	b mm	e mm	Seria 1		Seria 2		Seria 3		Seria 4		Seria 5			
							Series 1		Series 2		Series 3		Series 4		Series 5			
		ND	Type				s mm	masa	s mm	masa	s mm	masa	s mm	masa	s mm	masa	s mm	masa
								weight		weight		weight		weight		weight		weight
mm			kg		kg		kg		kg		kg		kg					
125	139.7	2	r≈1d	127	197	53	2.6	1.75	-	4.0	2.67	6.3	4.13	10.0	6.38			
		3	r≈1.5d	190	260	79		2.62			4.00		6.19		9.55			
		5	r≈2.5d	330	400	137		4.56			6.94		10.74		16.58			
		10	r≈5d	635	705	263		8.77			13.35		20.67		31.90			
		20	r≈10d	1270	1340	526		17.54			26.70		41.35		63.81			
150	168.3	2	r≈1d	152	237	63	2.6	2.54	4.5	4.5	4.34	7.1	6.74	11.0	10.19			
		3	r≈1.5d	229	313	95		3.82			6.54		10.15		15.35			
		5	r≈2.5d	390	474	162		6.51			11.14		17.29		26.14			
		10	r≈5d	762	846	316		12.72			21.76		33.78		51.08			
		20	r≈10d	1524	1608	631		25.43			43.52		67.57		102.15			
200	219.1	2	r≈1d	203	313	84	2.9	4.93	4.5	6.3	7.59	8.0	13.28	12.5	20.31			
		3	r≈1.5d	305	414	126		7.41			11.41		19.95		30.51			
		5	r≈2.5d	510	620	211		12.39			19.08		33.36		51.02			
		10	r≈5d	1016	1126	421		24.68			38.01		66.47		101.64			
		20	r≈10d	2032	2142	842		49.35			76.02		132.94		203.28			
250	273	2	r≈1d	254	391	105	2.9	7.71	5.0	6.3	13.18	8.8	22.88	-	-			
		3	r≈1.5d	381	518	158		11.56			19.78		34.31		-			
		5	r≈2.5d	650	787	269		19.72			33.74		58.54		-			
		10	r≈5d	1270	1407	526		38.54			65.92		114.38		-			
		20	r≈10d	2540	2677	1052		77.07			131.85		228.76		-			
300	323.9	2	r≈1d	305	467	126	2.9	11.00	5.6	7.1	21.06	10.0	37.09	-	-			
		3	r≈1.5d	457	619	189		16.48			31.56		55.57		-			
		5	r≈2.5d	775	937	321		27.95			53.51		94.24		-			
		10	r≈5d	1524	1686	631		54.96			105.23		185.32		-			
		20	r≈10d	3048	3210	1263		109.92			210.46		370.63		-			
350	355.6	2	r≈1d	356	533	148	3.2	15.55	5.6	8.0	27.03	11.0	52.28	-	-			
		3	r≈1.5d	533	711	221		23.28			40.47		78.27		-			
		5	r≈2.5d	850	1028	352		37.13			64.54		124.81		-			
		10	r≈5d	1778	1956	737		77.67			135.00		261.08		-			
		20	r≈10d	3556	3734	1473		155.34			270.00		522.17		-			
400	406.4	2	r≈1d	406	610	168	3.2	20.29	6.3	8.3	39.64	12.5	77.44	-	-			
		3	r≈1.5d	610	813	253		30.49			59.56		116.35		-			
		5	r≈2.5d	970	1173	402		48.48			94.72		185.02		-			
		10	r≈5d	2032	2235	842		101.56			198.41		387.58		-			
		20	r≈10d	4064	4264	1683		203.13			396.83		775.16		-			
450	457	2	r≈1d	457	686	189	4.0	32.08	6.3	10	50.27	-	-	-	-			
		3	r≈1.5d	686	914	284		48.15			75.46		118.79		-			
		5	r≈2.5d	1122	1350	465		78.76			123.41		194.29		-			
		10	r≈5d	2286	2515	947		160.46			251.45		395.84		-			
		20	r≈10d	4572	4801	1894		320.93			502.89		791.69		-			
500	508	2	r≈1d	508	762	210	4.0	39.67	6.3	11	62.20	-	-	-	-			
		3	r≈1.5d	762	1016	316		59.51			93.30		161.38		-			
		5	r≈2.5d	1245	1500	516		97.23			152.44		263.67		-			
		10	r≈5d	2540	2794	1052		198.36			311.00		537.93		-			
		20	r≈10d	5080	5334	2104		396.73			622.00		1075.85		-			
600	610	2	r≈1d	610	914	253	5.0	71.48	6.3	12.5	89.87	-	-	-	-			
		3	r≈1.5d	914	1219	379		107.11			134.66		264.44		-			
		5	r≈2.5d	1525	1830	632		178.70			224.68		441.22		-			
		10	r≈5d	3050	3355	1263		357.41			449.37		882.44		-			
		20	r≈10d	6100	6405	2527		714.82			898.73		1764.89		-			

tabel B 1.1. (Incheiere) table B 1.1. (Concluded)

DN	d mm	Tip		r mm	b mm	e mm	Seria 1		Seria 2		Seria 3		Seria 4		Seria 5			
							Series 1		Series 2		Series 3		Series 4		Series 5			
		ND	Type				s mm	masa	s mm	masa	s mm	masa	s mm	masa	s mm	masa	s mm	masa
								weight		weight		weight		weight		weight		weight
mm			kg		kg		kg		kg		kg		kg					
700	711	2	≈1d	711	1066	295	5.0	97.23	7.1	137.65	12.5	240.48	-	-	-	-		
			≈1.5d	1067	1422	442		145.91		206.57		360.89		-		-		
			≈2.5d	1778	2133	737		243.13		344.22		601.38		-		-		
			≈5d	3555	3911	1473		486.13		688.25		1202.42		-		-		
			≈10d	7110	7466	2945		972.26		1376.51		2404.84		-		-		
800	813	2	≈1d	813	1220	337	5.6	142.40	8	202.82	12.5	315.14	-	-	-	-		
			≈1.5d	1219	1626	505		213.51		304.11		472.51		-		-		
			≈2.5d	2033	2439	842		356.08		507.18		788.04		-		-		
			≈5d	4065	4472	1684		711.99		1014.11		1575.69		-		-		
			≈10d	8130	8537	3368		1423.99		2028.22		3151.38		-		-		
900	914	2	≈1d	914	1371	379	6.3	202.47	10	320.08	12.5	398.99	-	-	-	-		
			≈1.5d	1372	1829	568		303.93		480.47		598.92		-		-		
			≈2.5d	2285	2742	947		506.18		800.19		997.47		-		-		
			≈5d	4570	5027	1893		1012.37		1600.38		1994.95		-		-		
			≈10d	9140	9597	3786		2024.74		3200.77		3989.89		-		-		
1000	1016	2	≈1d	1016	1524	421	6.3	250.36	10	395.94	12.5	493.70	-	-	-	-		
			≈1.5d	1524	2032	631		375.54		593.91		740.55		-		-		
			≈2.5d	2540	3048	1052		625.90		989.85		1234.24		-		-		
			≈5d	5080	5588	2104		1251.80		1979.71		2468.49		-		-		
			≈10d	10160	10668	4208		2503.61		3959.42		4936.97		-		-		
1200	1220	2	≈1d	1220	1830	505	6.3	361.37	12.5	713.34	-	-	-	-	-	-		
			≈1.5d	1830	2440	758		542.05		1070.01		-		-	-			
			≈2.5d	3050	3660	1263		903.42		1783.35		-		-	-			
			≈5d	6100	6710	2527		1806.85		3566.70		-		-	-			
			≈10d	12200	12810	5053		3613.69		7133.40		-		-	-			
1400	1420	2	≈1d	1420	2130	588	6.3	489.92	12.5	967.80	-	-	-	-	-	-		
			≈1.5d	2130	2840	882		734.88		1451.70		-		-	-			
			≈2.5d	3550	4260	1471		1224.80		2419.50		-		-	-			
			≈5d	7100	7810	2941		2449.60		4839.01		-		-	-			
			≈10d	14200	14910	5882		4899.20		9678.01		-		-	-			
1600	1620	2	≈1d	1620	2430	671	6.3	638.00	12.5	1261.00	-	-	-	-	-	-		
			≈1.5d	2430	3240	1007		956.99		1891.50		-		-	-			
			≈2.5d	4050	4860	1678		1594.99		3152.50		-		-	-			
			≈5d	8100	8910	3355		3189.98		6305.01		-		-	-			
			≈10d	16200	17010	6710		6379.96		12610.01		-		-	-			

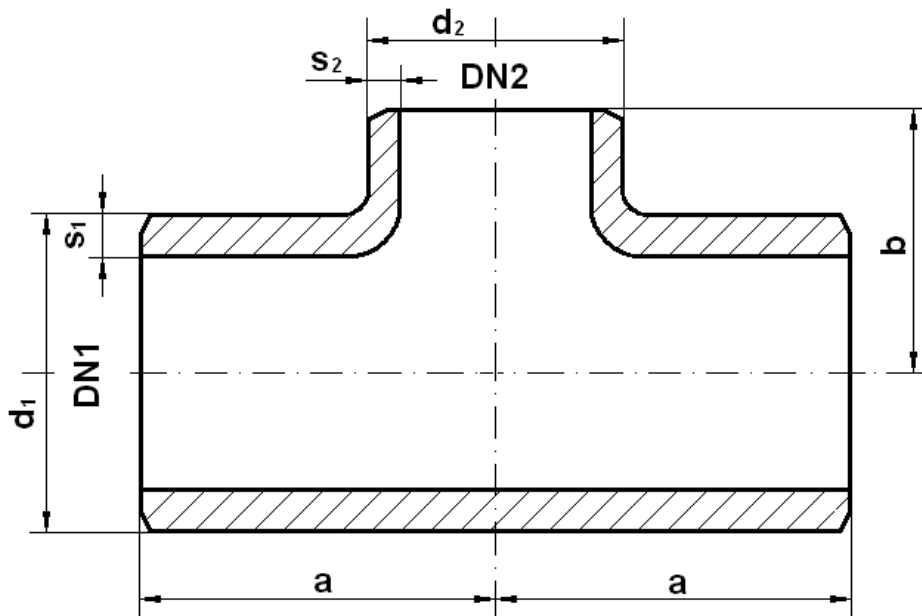
Coturile din oțel carbon sau din inox care nu sunt pe stoc pot fi livrate în 10-15 zile de la comanda.

Elbows from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

Coturi și curbe cu alte grosimi ale peretelui: Coturi și curbe cu grosimi ale peretelui diferite de cele specificate în tabelul B.1.1. pot fi comandate conform acestui tabel mai puțin grosimea „s”.

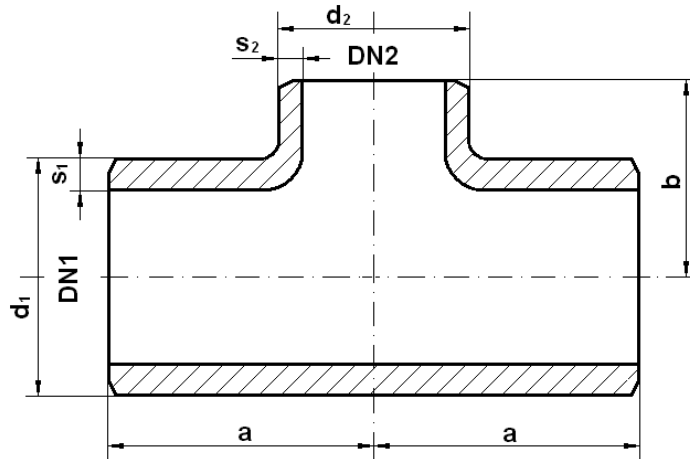
Other wall thicknesses: Elbows and bends with wall thicknesses other than those specified in table B 1.1. may also be ordered in accordance with this table without thickness „s”.

1.2. Teuri pentru sudura conform standardului german DIN 2615-1 Tees for Welding According to German Standard DIN 2615-1



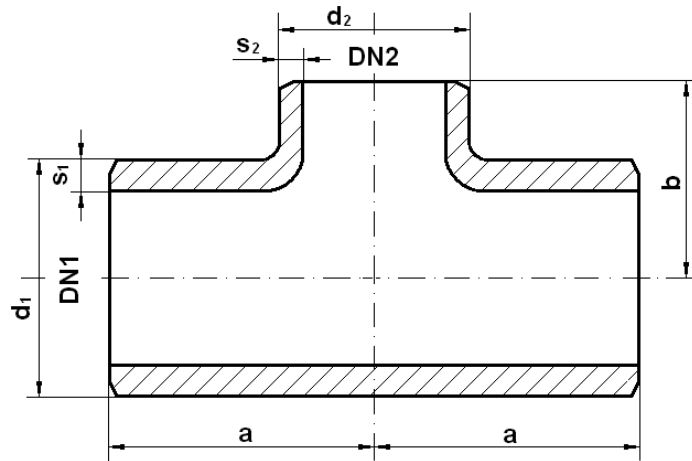
tabel B 1.2. table B 1.2.

DN1 mm	d1 mm	Grosimile s1(mm) pentru seriile Wall thickness s1(mm) for series					DN2 mm	d2 mm	Grosimile s2(mm) pentru seriile Wall thickness s2(mm) for series					a mm	b mm
		ND1 mm	1	2	3	4			5	ND2 mm	1	2	3		
15	21.3	1.6	-	2.0	3.2	4.0	15	21.3	1.6	-	2.0	3.2	4.0	25	25
							10	17.2	1.6	-	1.8	2.9	-		25
20	26.9	1.6	-	2.3	3.2	4.0	20	26.9	1.6	-	2.3	3.2	4.0	29	29
							15	21.3	1.6	-	2.0	3.2	4.0		29
25	33.7	2.0	-	2.6	3.2	4.0	25	33.7	2.0	-	2.6	3.2	4.0	38	38
							20	26.9	1.6	-	2.3	3.2	4.0		38
32	42.4	2.0	-	2.6	3.6	4.0	32	42.4	2.0	-	2.6	3.6	4.0	48	48
							25	33.7	2.0	-	2.6	3.2	4.0		48
40	48.3	2.0	-	2.6	4.0	5.0	40	48.3	2.0	-	2.6	4.0	5.0	57	57
							32	42.4	2.0	-	2.6	3.6	4.0		57
50	60.3	2.0	-	2.9	4.5	5.6	50	60.3	2.0	-	2.9	4.5	5.6	64	64
							40	48.3	2.0	-	2.6	4.0	5.0		64
65	76.1	2.3	-	2.9	5.0	7.1	65	76.1	2.3	-	2.9	5.0	7.1	76	76
							50	60.3	2.0	-	2.9	4.5	5.6		76
65	76.1	2.3	-	2.9	5.0	7.1	40	48.3	2.0	-	2.6	4.0	5.0	76	67
							32	42.4	2.0	-	2.6	3.6	4.0		76
65	76.1	2.3	-	2.9	5.0	7.1	25	33.7	2.0	-	2.6	3.2	4.0	76	57
							20	26.9	1.6	-	2.3	3.2	4.0		76



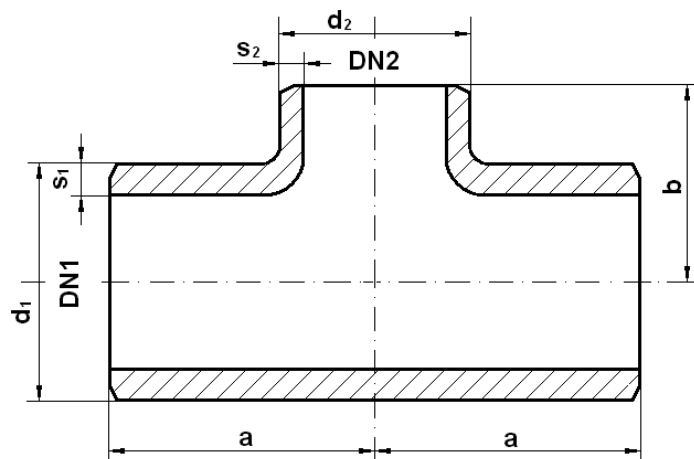
tabel B 1.2. (Continuare) table B 1.2. (Continued)

DN1 mm	d1 mm	Grosimile s1(mm) pentru seriile Wall thickness s1(mm) for series					DN2 mm	d2 mm	Grosimile s2(mm) pentru seriile Wall thickness s2(mm) for series					a mm	b mm
		1	2	3	4	5			1	2	3	4	5		
80	88.9	2.3	-	3.2	5.6	8.0	80	88.9	2.3	-	3.2	5.6	8.0	86	86
							65	76.1	2.3	-	2.9	5.0	7.1		83
							50	60.3	2.0	-	2.9	4.5	5.6		76
							40	48.3	2.0	-	2.6	4.0	5.0		73
							32	42.4	2.0	-	2.6	3.6	4.0		70
100	114.3	2.6	-	3.6	6.3	8.8	100	114.3	2.6	-	3.6	6.3	8.8	105	105
							80	88.9	2.3	-	3.2	5.6	8.0		98
							65	76.1	2.3	-	2.9	5.0	7.1		95
							50	60.3	2.0	-	2.9	4.5	5.6		89
							40	48.3	2.0	-	2.6	4.0	5.0		86
125	139.7	2.6	-	4.0	6.3	10.0	125	139.7	2.6	-	4.0	6.3	10.0	124	124
							100	114.3	2.6	-	3.6	6.3	8.8		117
							80	88.9	2.3	-	3.2	5.6	8.0		111
							65	76.1	2.3	-	2.9	5.0	7.1		108
							50	60.3	2.0	-	2.9	4.5	5.6		105
150	168.3	2.6	4.0	4.5	7.1	11.0	150	168.3	2.6	4.0	4.5	7.1	11.0	143	143
							125	139.7	2.6	-	4.0	6.3	10.0		137
							100	114.3	2.6	-	3.6	6.3	8.8		130
							80	88.9	2.3	-	3.2	5.6	8.0		124
							65	76.1	2.3	-	2.9	5.0	7.1		121
200	219.1	2.9	4.5	6.3	8.0	12.5	200	219.1	2.9	4.5	6.3	8.0	12.5	178	176
							150	168.3	2.6	4.0	4.5	7.1	11.0		168
							125	139.7	2.6	-	4.0	6.3	10.0		162
							100	114.3	2.6	-	3.6	6.3	8.8		156
							80	88.9	2.3	-	3.2	5.6	8.0		152
250	273.0	2.9	5.0	6.3	8.8	14.2	250	273.0	2.9	5.0	6.3	8.8	14.2	216	216
							200	219.1	2.9	4.5	6.3	8.0	12.5		203
							150	168.3	2.6	4.0	4.5	7.1	11.0		194
							125	139.7	2.6	-	4.0	6.3	10.0		191
							100	114.3	2.6	-	3.6	6.3	8.8		184
300	323.9	2.9	5.6	7.1	10.0	16.0	300	323.9	2.9	5.6	7.1	10.0	16.0	254	254
							250	273.0	2.9	5.0	6.3	8.8	14.2		241
							200	219.1	2.9	4.5	6.3	8.0	12.5		229
							150	168.3	2.6	4.0	4.5	7.1	11.0		219
							125	139.7	2.6	-	4.0	6.3	10.0		216



tabel B 1.2. (Continuare) table B 1.2. (Continued)

DN1 mm	d1 mm	Grosimile s1(mm) pentru seriile Wall thickness s1(mm) for series					DN2 mm	d2 mm	Grosimile s2(mm) pentru seriile Wall thickness s2(mm) for series					a mm	b mm
		1	2	3	4	5			1	2	3	4	5		
350	355.6	3.2	5.6	8.0	11.0	17.5	350	355.6	3.2	5.6	8.0	11.0	17.5	279	279
							300	323.9	2.9	5.6	7.1	10.0	16.0		270
							250	273.0	2.9	5.0	6.3	8.8	14.2		257
							200	219.1	2.9	4.5	6.3	8.0	12.5		248
							150	168.3	2.6	4.0	4.5	7.1	11.0		238
400	406.4	3.2	6.3	8.8	12.5	20.0	400	406.4	3.2	6.3	8.8	12.5	20.0	305	305
							350	355.6	3.2	5.6	8.0	11.0	17.5		305
							300	323.9	2.9	5.6	7.1	10.0	16.0		295
							250	273.0	2.9	5.0	6.3	8.8	14.2		283
							200	219.1	2.9	4.5	6.3	8.0	12.5		273
450	457.0	4.0	6.3	10.0	14.2	22.2	450	457.0	4.0	6.3	10.0	14.2	22.2	343	343
							400	406.4	3.2	6.3	8.8	12.5	20.0		330
							350	355.6	3.2	5.6	8.0	11.0	17.5		330
							300	323.9	2.9	5.6	7.1	10.0	16.0		321
							250	273.0	2.9	5.0	6.3	8.8	14.2		308
500	508.0	4.0	6.3	11.0	16.0	25	500	508.0	4.0	6.3	11.0	16.0	25	381	381
							450	457.0	4.0	6.3	10.0	14.2	22.2		368
							400	406.4	3.2	6.3	8.8	12.5	20.0		356
							350	355.6	3.2	5.6	8.0	11.0	17.5		356
							300	323.9	2.9	5.6	7.1	10.0	16.0		346
600	610.0	5.0	6.3	12.5	17.5	-	600	610.0	5.0	6.3	12.5	17.5	-	432	432
							500	508.0	4.0	6.3	11.0	16.0	-		432
							450	457.0	4.0	6.3	10.0	14.2	-		419
							400	406.4	3.2	6.3	8.8	12.5	-		406
							350	355.6	3.2	5.6	8.0	11.0	-		406
							300	323.9	2.9	5.6	7.1	10.0	-		397
							250	273.0	2.9	5.0	6.3	8.8	-		384



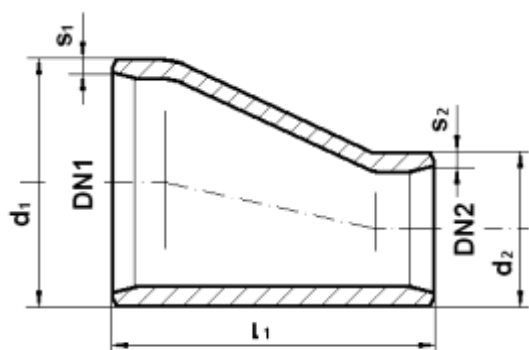
tabel B 1.2. (Incheiere) table B 1.2. (Concluded)

DN1 mm	d1 mm	Grosimile s1(mm) pentru seriile Wall thickness s1(mm) for series					DN2 mm	d2 mm	Grosimile s2(mm) pentru seriile Wall thickness s2(mm) for series					a mm	b mm
		1	2	3	4	5			1	2	3	4	5		
700	711.0	5.0	7.1	12.5	-	-	700	711.0	5.0	7.1	12.5	-	-	521	521
							600	610.0	5.0	6.3	12.5	-	-		508
							500	508.0	4.0	6.3	11.0	-	-		483
							450	457.0	4.0	6.3	10.0	-	-		470
							400	406.4	3.2	6.3	8.8	-	-		457
							350	355.6	3.2	5.6	8.0	-	-		457
							300	323.9	2.9	5.6	7.1	-	-		448
800	813.0	5.6	8.0	12.5	-	-	800	813.0	5.6	8.0	12.5	-	-	597	597
							700	711.0	5.0	7.1	12.5	-	-		572
							600	610.0	5.0	6.3	12.5	-	-		559
							500	508.0	4.0	6.3	11.0	-	-		533
							450	457.0	4.0	6.3	10.0	-	-		521
							400	406.4	3.2	6.3	8.8	-	-		508
							350	355.6	3.2	5.6	8.0	-	-		508
900	914.0	6.3	10.0	12.5	-	-	900	914.0	6.3	10.0	12.5	-	-	673	673
							800	813.0	5.6	8.0	12.5	-	-		648
							700	711.0	5.0	7.1	12.5	-	-		622
							600	610.0	5.0	6.3	12.5	-	-		610
							500	508.0	4.0	6.3	11.0	-	-		584
							450	457.0	4.0	6.3	10.0	-	-		572
							400	406.4	3.2	6.3	8.8	-	-		559
1000	1016.0	6.3	10.0	12.5	-	-	1000	1016.0	6.3	10.0	12.5	-	-	749	749
							900	914.0	6.3	10.0	12.5	-	-		737
							800	813.0	5.6	8.0	12.5	-	-		711
							700	711.0	5.0	7.1	12.5	-	-		673
							600	610.0	5.0	6.3	12.5	-	-		660
							500	508.0	4.0	6.3	11.0	-	-		635
							450	457.0	4.0	6.3	10.0	-	-		622
1200	1220.0	6.3	12.5	-	-	-	1200	1220.0	6.3	12.5	-	-	-	889	838
							1000	1016.0	6.3	10.0	-	-	-		813
							900	914.0	6.3	10.0	-	-	-		787
							800	813.0	5.6	8.0	-	-	-		787
							700	711.0	5.0	7.1	-	-	-		762
							600	610.0	5.0	6.3	-	-	-		737

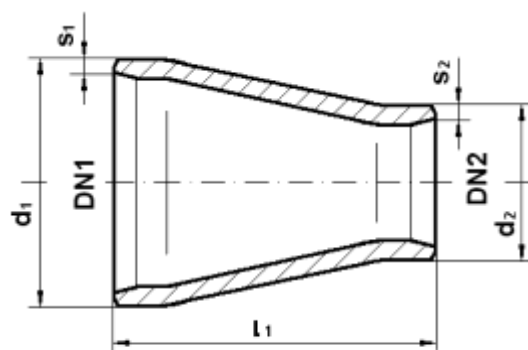
Teurile din oțel carbon sau din inox care nu sunt pe stoc pot fi livrate în 10-15 zile de la comandă.

Tees from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

1.3. Reductii pentru sudura conform standardului german DIN 2616-2 Reducers for Welding According to German Standard DIN 2616-2



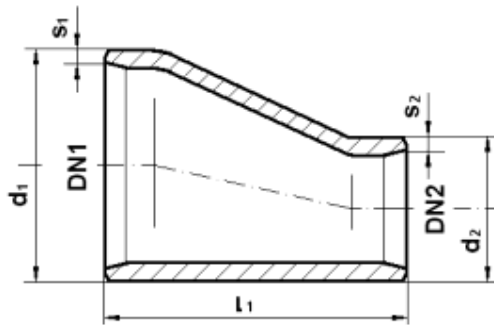
1. Reductie excentrica (Eccentric reducer)



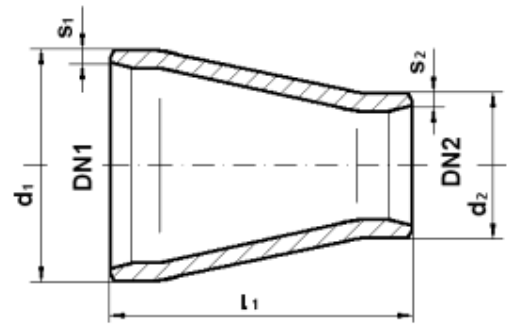
2. Reductie concentrica (Concentric reducer)

tabel B 1.3. table B 1.3.

DN1	d1 mm	Grosimile s1(mm) pentru seriile:					DN2	d2 mm	Grosimile s2(mm) pentru seriile:					l1 mm
ND1		Wall thickness s1(mm) for series:					ND2		Wall thickness s2(mm) for series:					
mm		1	2	3	4	5	mm	1	2	3	4	5		
15	21.3	1.6	-	2.0	3.2	4.0	10	17.2	1.6	-	1.8	2.9	-	38
20	26.9	1.6	-	2.3	3.2	4.0	15	21.3	1.6	-	2.0	3.2	4.0	38
							10	17.2	1.6	-	1.8	2.9	-	
25	33.7	2.0	-	2.6	3.2	4.0	20	26.9	1.6	-	2.3	3.2	4.0	50
							15	21.3	1.6	-	2.0	3.2	4.0	
32	42.4	2.0	-	2.6	3.6	4.0	25	33.7	2.0	-	2.6	3.2	4.0	50
							20	26.9	1.6	-	2.3	3.2	4.0	
							15	21.3	1.6	-	2.0	3.2	4.0	
40	48.3	2.0	-	2.6	4.0	5.0	32	42.4	2.0	-	2.6	3.6	4.0	64
							25	33.7	2.0	-	2.6	3.2	4.0	
							20	26.9	1.6	-	2.3	3.2	4.0	
50	60.3	2.0	-	2.9	4.5	5.6	40	48.3	2.0	-	2.6	4.0	5.0	76
							32	42.4	2.0	-	2.6	3.6	4.0	
							25	33.7	2.0	-	2.6	3.2	4.0	
							20	26.9	1.6	-	2.3	3.2	4.0	
65	76.1	2.3	-	2.9	5.0	7.1	50	60.3	2.0	-	2.9	4.5	5.6	90
							40	48.3	2.0	-	2.6	4.0	5.0	
							32	42.4	2.0	-	2.6	3.6	4.0	
							25	33.7	2.0	-	2.6	3.2	4.0	
80	88.9	2.3	-	3.2	5.6	8.0	65	76.1	2.3	-	2.9	5.0	7.1	90
							50	60.3	2.0	-	2.9	4.5	5.6	
							40	48.3	2.0	-	2.6	4.0	5.0	
							32	42.4	2.0	-	2.6	3.6	4.0	
100	114.3	2.6	-	3.6	6.3	8.8	80	88.9	2.3	-	3.2	5.6	8.0	100
							65	76.1	2.3	-	2.9	5.0	7.1	
							50	60.3	2.0	-	2.9	4.5	5.6	
							40	48.3	2.0	-	2.6	4.0	5.0	
125	139.7	2.6	-	4.0	6.3	10.0	100	114.3	2.6	-	3.6	6.3	8.8	127
							80	88.9	2.3	-	3.2	5.6	8.0	
							65	76.1	2.3	-	2.9	5.0	7.1	
							50	60.3	2.0	-	2.9	4.5	5.6	



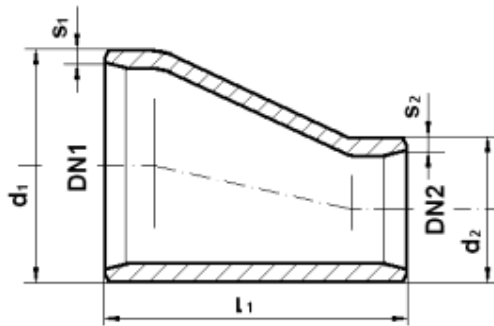
1. Reductie excentrica (Eccentric reducer)



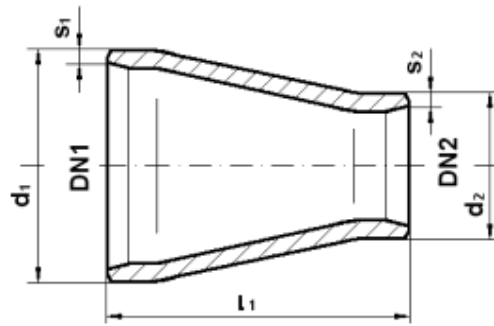
2. Reductie concentrica (Concentric reducer)

tabel B 1.3. (Continuare) table B 1.3. (Continued)

DN1	d1 mm	Grosimile s1(mm) pentru seriile:					DN2	d2 mm	Grosimile s2(mm) pentru seriile:					l1 mm
ND1		Wall thickness s1(mm) for series:					ND2		Wall thickness s2(mm) for series:					
mm		1	2	3	4	5	mm		1	2	3	4	5	
150	168.3	2.6	4.0	4.5	7.1	11.0	125	139.7	2.6	4.0	4.0	6.3	10.0	140
							100	114.3	2.6	3.6	3.6	6.3	8.8	
							80	88.9	2.3	3.2	3.2	5.6	8.0	
							65	76.1	2.3	2.9	2.9	5.0	7.1	
200	219.1	2.9	4.5	6.3	8.0	12.5	150	168.3	2.6	4.0	4.5	7.1	11.0	152
							125	139.7	2.6	4.0	4.0	6.3	10.0	
							100	114.3	2.6	3.6	3.6	6.3	8.8	
							80	88.9	2.3	3.2	3.2	5.6	8.0	
250	273.0	2.9	5.0	6.3	8.8	14.2	200	219.1	2.9	4.5	6.3	8.0	12.5	178
							150	168.3	2.6	4.0	4.5	7.1	11.0	
							125	139.7	2.6	4.0	4.0	6.3	10.0	
							100	114.3	2.6	3.6	3.6	6.3	8.8	
300	323.9	2.9	5.6	7.1	10.0	16.0	250	273.0	2.9	5.0	6.3	8.8	14.2	203
							200	219.1	2.9	4.5	6.3	8.0	12.5	
							150	168.3	2.6	4.0	4.5	7.1	11.0	
							125	139.7	2.6	4.0	4.0	6.3	10.0	
350	355.6	3.2	5.6	8.0	11.0	17.5	300	323.9	2.9	5.6	7.1	10.0	16.0	330
							250	273.0	2.9	5.0	6.3	8.8	14.2	
							200	219.1	2.9	4.5	6.3	8.0	12.5	
							150	168.3	2.6	4.0	4.5	7.1	11.0	
400	406.4	3.2	6.3	8.8	12.5	20.0	350	355.6	3.2	5.6	8.0	11.0	17.5	355
							300	323.9	2.9	5.6	7.1	10.0	16.0	
							250	273.0	2.9	5.0	6.3	8.8	14.2	
							200	219.1	2.9	4.5	6.3	8.0	12.5	
							150	168.3	2.6	4.0	4.5	7.1	11.0	
450	457.0	4.0	6.3	10.0	14.2	22.2	400	406.4	3.2	6.3	8.8	12.5	20.0	381
							350	355.6	3.2	5.6	8.0	11.0	17.5	
							300	323.9	2.9	5.6	7.1	10.0	16.0	
							250	273.0	2.9	5.0	6.3	8.8	14.2	
							200	219.1	2.9	4.5	6.3	8.0	12.5	
500	508.0	4.0	6.3	11.0	16.0	25	450	457.0	4.0	6.3	10.0	14.2	22.2	508
							400	406.4	3.2	6.3	8.8	12.5	20.0	
							350	355.6	3.2	5.6	8.0	11.0	17.5	
							300	323.9	2.9	5.6	7.1	10.0	16.0	
							250	273.0	2.9	5.0	6.3	8.8	14.2	
							200	219.1	2.9	4.5	6.3	8.0	12.5	



1. Reductie excentrica (Eccentric reducer)



2. Reductie concentrica (Concentric reducer)

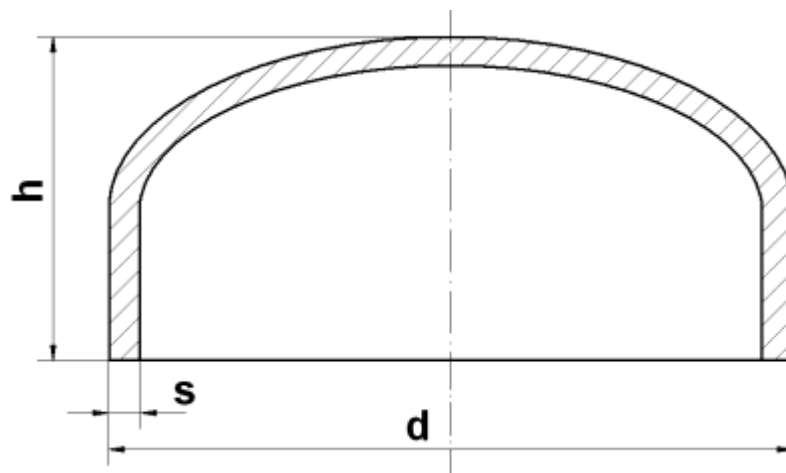
tabel B 1.3. (Incheiere) table B 1.3. (Concluded)

DN1	d1 mm	Grosimile s1(mm) pentru seriile					DN2	d2 mm	Grosimile s2(mm) pentru seriile					l1 mm
ND1		Wall thickness s1(mm) for series					ND2		Wall thickness s2(mm) for series					
mm		1	2	3	4	5	mm		1	2	3	4	5	
600	610.0	5.0	6.3	12.5	17.5	30.0	500	508.0	4.0	6.3	11.0	16.0	25.0	508
							450	457.0	4.0	6.3	10.0	14.2	22.2	
							400	406.4	3.2	6.3	8.8	12.5	20.0	
							350	355.6	3.2	5.6	8.0	11.0	17.5	
							300	323.9	2.9	5.6	7.1	10.0	16.0	
							250	273.0	2.9	5.0	6.3	8.8	14.2	
700	711.0	5.0	7.1	12.5	20.0	32.0	600	610.0	5.0	6.3	12.5	17.5	30.0	610
							500	508.0	4.0	6.3	11.0	16.0	25.0	
							450	457.0	4.0	6.3	10.0	14.2	22.2	
							400	406.4	3.2	6.3	8.8	12.5	20.0	
							350	355.6	3.2	5.6	8.0	11.0	17.5	
							300	323.9	2.9	5.6	7.1	10.0	16.0	
800	813.0	5.6	8.0	12.5	22.2	36.0	700	711.0	5.0	7.1	12.5	20.0	32.0	610
							600	610.0	5.0	6.3	12.5	17.5	30.0	
							500	508.0	4.0	6.3	11.0	16.0	25.0	
							450	457.0	4.0	6.3	10.0	14.2	22.2	
							400	406.4	3.2	6.3	8.8	12.5	20.0	
							350	355.6	3.2	5.6	8.0	11.0	17.5	
900	914.0	6.3	10.0	12.5	25.0	40.0	800	813.0	5.6	8.0	12.5	22.2	36.0	610
							700	711.0	5.0	7.1	12.5	20.0	32.0	
							600	610.0	5.0	6.3	12.5	17.5	30.0	
							500	508.0	4.0	6.3	11.0	16.0	25.0	
							450	457.0	4.0	6.3	10.0	14.2	22.2	
							400	406.4	3.2	6.3	8.8	12.5	20.0	
1000	1016.0	6.3	10.0	12.5	28.0	45.0	900	914.0	6.3	10.0	12.5	25.0	40.0	610
							800	813.0	5.6	8.0	12.5	22.2	36.0	
							700	711.0	5.0	7.1	12.5	20.0	32.0	
							600	610.0	5.0	6.3	12.5	17.5	30.0	
							500	508.0	4.0	6.3	11.0	16.0	25.0	
							450	457.0	4.0	6.3	10.0	14.2	22.2	
1200	1220.0	6.3	12.5	-	-	-	1000	1016.0	6.3	10.0	-	-	-	711
							900	914.0	6.3	10.0	-	-	-	
							800	813.0	5.6	8.0	-	-	-	
							700	711.0	5.0	7.1	-	-	-	
							600	610.0	5.0	6.3	-	-	-	

Reductiile din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Reducers from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

1.4. Capace pentru sudura conform standardului german DIN 2617 Caps for Welding According to German Standard DIN 2617



tabel B 1.4. table B 1.4.

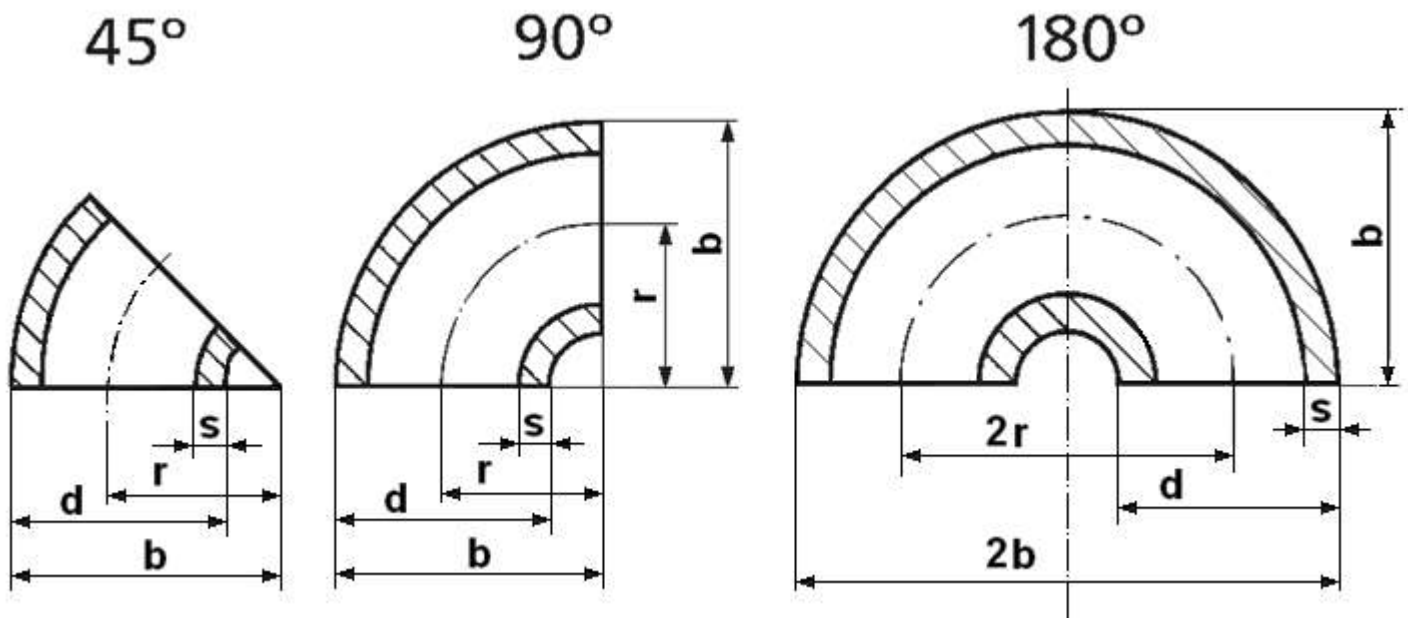
DN ND mm	d mm	Grosimile s(mm) pentru seriile: Wall thickness s(mm) for series					h mm
		1	2	3	4	5	
15	21.3	1.6	-	2.0	3.2	4.0	25
20	26.9	1.6	-	2.3	3.2	4.0	25
25	33.7	2.0	-	2.6	3.2	4.0	38
32	42.4	2.0	-	2.6	3.6	4.0	38
40	48.3	2.0	-	2.6	4.0	5.0	38
50	60.3	2.0	-	2.9	4.5	5.6	38
65	76.1	2.3	-	2.9	5.0	7.1	38
80	88.9	2.3	-	3.2	5.6	8.0	51
100	114.3	2.6	-	3.6	6.3	8.8	64
125	139.7	2.6	-	4.0	6.3	10.0	75
150	168.3	2.6	4.0	4.5	7.1	11.0	89
200	219.1	2.9	4.5	6.3	8.0	12.5	102
250	273.0	2.9	5.0	6.3	8.8	14.2	127
300	323.9	2.9	5.6	7.1	10.0	16.0	152
350	355.6	3.2	5.6	8.0	11.0	17.5	165
400	406.4	3.2	6.3	8.8	12.5	20.0	178
450	457	4.0	6.3	10.0	14.2	22.2	203
500	508	4.0	6.3	11.0	16.0	25	229
600	610	5.0	6.3	12.5	17.5	30.0	267
700	711	5.0	7.1	12.5	20.0	32.0	267
800	813	5.6	8.0	12.5	22.2	36.0	267
900	914	6.3	10.0	12.5	25.0	40.0	267
1000	1016	6.3	10.0	12.5	28.0	45.0	305
1200	1220	6.3	12.5	-	-	-	343
Capacele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.							
Caps from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.							

Capace cu alte grosimi ale peretelui: Capace cu grosimi ale peretelui diferite de cele specificate in tabelul B 1.4. pot fi comandate conform acestui tabel mai putin grosimea „s”.

Other wall thicknesses: Caps with wall thicknesses other than those specified in table B 1.4. may also be ordered in accordance with this table without thickness „s”.

2. Fitinguri pentru sudura conform standardelor americane *Butt Welding Pipe Fittings According to American Standards*

2.1. Coturi pentru sudura conform standardului american ANSI B16.9 *Butt Weld Elbows According to American Standard ANSI B16.9*



Variante constructive *Schedules*

- Light Wall
- Schedule 10 (Sch 10, S 10)
- Schedule 20 (Sch 20, S 20)
- Schedule 30 (Sch 30, S 30)
- Schedule 40 (Sch 40, S 40)
- Standard Wall (ST, STD)
- Schedule 60 (Sch 60, S 60)
- Extra Strong (Extra Heavy Wall, EH, XH, XS)
- Schedule 80 (Sch 80, S 80)
- Schedule 100 (Sch 100, S 100)
- Schedule 120 (Sch 120, S 120)
- Schedule 140 (Sch 140, S 140)
- Schedule 160 (Sch 160, S 160)
- Double Extra Strong (Double Extra Heavy Wall, XXH, XXS)

In calculul masei cotului tras, se ia ca baza teava de origine, un tub a carei inaltime se considera a fi lungimea arcului de cerc de raza „r”. Astfel masa cotului de 90° va fi:

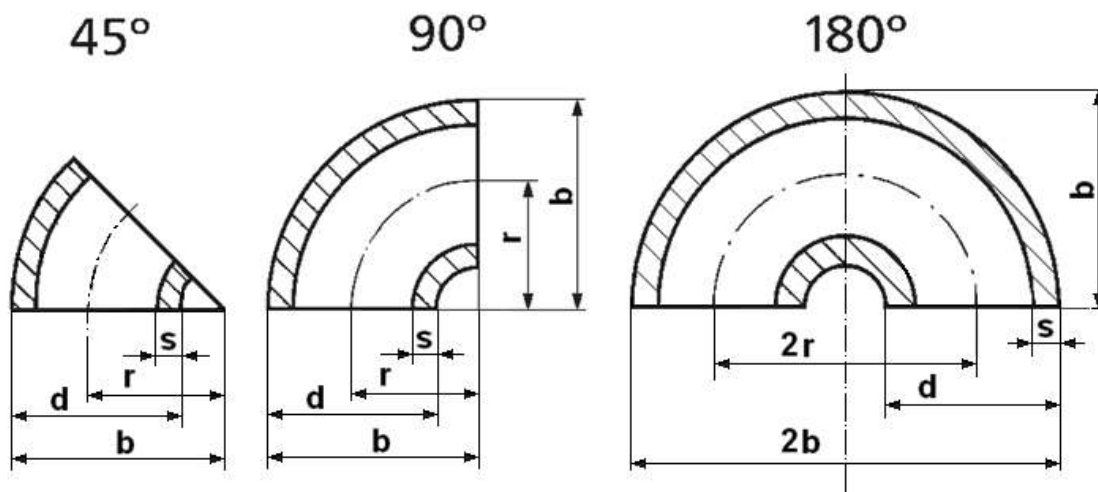
The mass calculation of elbows from seamless pipe begin from the pipe of origin. This pipe have the height equal to the lenght of the arc of circle with radius „r”. Then mass of 90° elbow will be:

$$m = \frac{\pi}{4} [d^2 - (d - 2s)^2] \times \frac{2\pi \cdot r}{4} \times 7.85 \times 10^{-6} \text{ kg}$$

$$m = \frac{\pi^2 r s (d - s)}{2} \times 7.85 \times 10^{-6} \text{ kg}$$

Masele coturilor de 45°, 60° si 180° vor fi usor de calculat inmultind masa cotului de 90° cu 1/2, 2/3, si respectiv 2.
The mass of 45°, 60° and 180° elbows will be easy calculate multiplying mass of 90° elbow with 1/2, 2/3, and respectively 2.

**2.1.1. Coturi pentru sudura conform ANSI B16.9 LR
Butt Weld Elbows According to ANSI B16.9 LR**



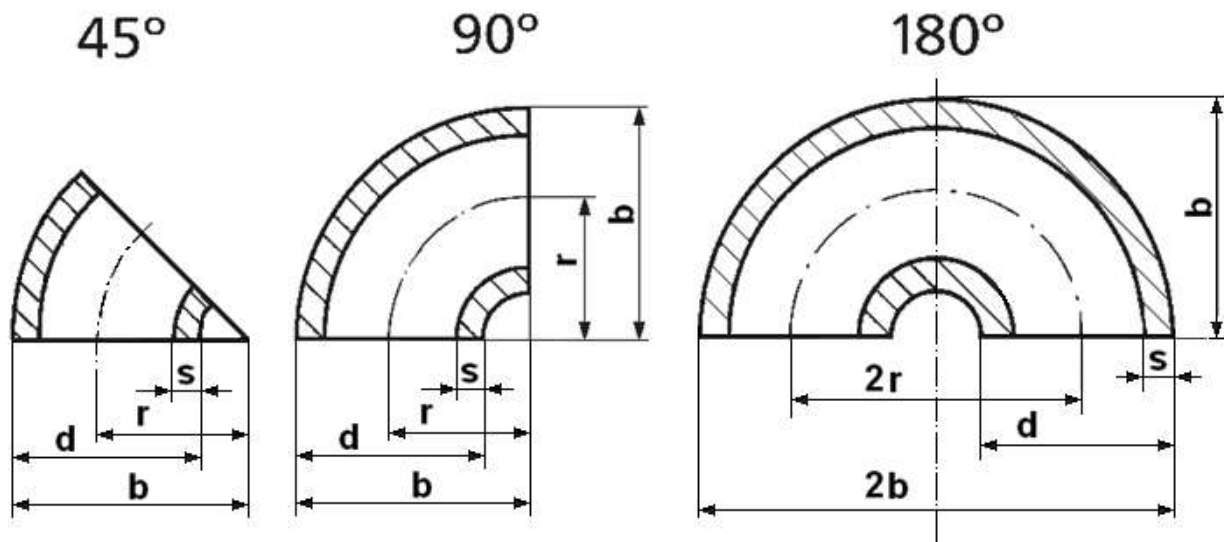
„LR”(long radius) este echivalent cu „ $r \geq 1.5d$ ”
 „LR” (long radius) are similar to „ $r \geq 1.5d$ ”

tabel B 2.1.1. table B 2.1.1.

DN țoli	d mm	r mm	b mm	SCH 20			SCH 30			STD			SCH 40			SCH 60			XS		
				s mm	masa kg	weight	s mm	masa kg	weight	s mm	masa kg	weight	s mm	masa kg	weight	s mm	masa kg	weight	s mm	masa kg	weight
1/2"	21.3	38	48	-	-	-	-	-	2.77	0.08	-	-	-	-	-	-	-	-	3.73	0.10	
3/4"	26.7	38	51	-	-	-	-	-	2.87	0.10	-	-	-	-	-	-	-	-	3.91	0.13	
1"	33.4	38	56	-	-	-	-	-	3.38	0.15	3.38	0.15	-	-	-	-	-	-	4.55	0.19	
1 1/4"	42.2	48	70	-	-	-	-	-	3.56	0.26	3.56	0.26	-	-	-	-	-	-	4.85	0.34	
1 1/2"	48.3	57	83	-	-	-	-	-	3.68	0.36	3.68	0.36	-	-	-	-	-	-	5.08	0.48	
2"	60.3	76	106	-	-	-	-	-	3.91	0.65	3.91	0.65	-	-	-	-	-	-	5.54	0.89	
2 1/2"	73.1	95	133	-	-	-	-	-	5.16	1.29	5.16	1.29	-	-	-	-	-	-	7.01	1.70	
3"	88.9	114	159	-	-	-	-	-	5.49	2.02	5.49	2.02	-	-	-	-	-	-	7.62	2.73	
3 1/2"	101.6	133	184	-	-	-	-	-	5.74	2.83	5.74	2.83	-	-	-	-	-	-	8.08	3.89	
4"	114.3	152	210	-	-	-	-	-	6.02	3.83	6.02	3.83	-	-	-	-	-	-	8.56	5.32	
5"	141.3	190	262	-	-	-	-	-	6.55	6.49	6.55	6.49	-	-	-	-	-	-	9.52	9.23	
6"	168.3	229	313	-	-	-	-	-	7.11	10.16	7.11	10.16	-	-	-	-	-	-	10.97	15.30	
8"	219.1	305	414	6.35	15.95	7.04	17.62	8.18	20.36	8.18	20.36	10.31	25.41	12.70	30.94	-	-	-	-	-	
10"	273	381	518	6.35	24.97	7.80	30.50	9.27	36.05	9.27	36.05	12.70	48.74	12.70	48.74	-	-	-	-	-	
12"	323.8	457	619	6.35	35.65	8.38	46.75	9.52	52.97	10.31	57.16	14.27	78.12	12.70	69.87	-	-	-	-	-	
14"	355.6	533	711	7.92	56.80	9.52	68.03	9.52	68.03	11.13	79.08	15.09	105.99	12.70	89.83	-	-	-	-	-	
16"	406.4	607	813	7.92	74.13	9.52	88.84	9.52	88.84	12.70	117.45	16.60	152.00	12.70	117.45	-	-	-	-	-	
18"	457.2	683	914	7.92	94.01	11.13	131.17	9.52	112.71	14.27	166.99	19.05	220.52	12.70	149.14	-	-	-	-	-	
20"	508	759	1116	9.52	139.53	12.70	184.76	9.52	139.53	15.09	218.47	20.62	295.19	12.70	184.76	-	-	-	-	-	
22"	558.8	838	1118	9.52	169.58	12.70	224.92	9.52	169.58	-	-	22.22	387.00	12.70	224.92	-	-	-	-	-	
24"	610	911	1219	9.52	201.74	14.27	299.70	9.52	201.74	17.45	366	24.61	507.90	12.70	267.43	-	-	-	-	-	
26"	660	991		12.70	316.00	-	-	9.52	238	-	-	-	-	12.70	316.00	-	-	-	-	-	
28"	711	1067		12.70	367.00	15.87	456.00	9.52	-	-	-	-	-	12.70	367.00	-	-	-	-	-	
30"	762	1143		12.70	421.00	15.87	524.00	9.52	-	-	-	-	-	12.70	421.00	-	-	-	-	-	
32"	813	1219		12.70	480.00	15.87	597.00	9.52	-	17.47	656.00	-	-	12.70	480.00	-	-	-	-	-	
36"	914	1372		12.70	608.00	15.87	758.00	9.52	-	19.05	906.00	-	-	12.70	608.00	-	-	-	-	-	

Coturile din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Elbows from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.



tabel B 2.1.1. (Continuare) table B 2.1.1. (Continued)

DN toli	d mm	r mm	b mm	SCH 80			SCH 100			SCH 120			SCH 140			SCH 160			XXS		
				s mm	masa kg	weight	s mm	masa kg	weight	s mm	masa kg	weight	s mm	masa kg	weight	s mm	masa kg	weight	s mm	masa kg	weight
1/2"	21.3	38	48	-	-	-	-	-	-	-	-	-	-	-	4.78	0.12	-	-	-	-	
3/4"	26.7	38	51	-	-	-	-	-	-	-	-	-	-	-	5.56	0.17	-	-	-	-	
1"	33.4	38	56	4.55	0.19	-	-	-	-	-	-	-	-	-	6.35	0.25	9.09	0.16	-	-	
1 1/4"	42.2	48	70	4.85	0.34	-	-	-	-	-	-	-	-	-	6.35	0.42	9.7	0.24	-	-	
1 1/2"	48.3	57	83	5.08	0.48	-	-	-	-	-	-	-	-	-	7.14	0.65	10.16	0.35	-	-	
2"	60.3	76	106	5.54	0.89	-	-	-	-	-	-	-	-	-	8.74	1.33	11.07	0.64	-	-	
2 1/2"	73.1	95	133	7.01	1.70	-	-	-	-	-	-	-	-	-	9.52	2.23	14.02	1.06	-	-	
3"	88.9	114	159	7.62	2.73	-	-	-	-	-	-	-	-	-	11.13	3.82	15.24	2.02	-	-	
3 1/2"	101.6	133	184	8.08	3.89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4"	114.3	152	210	8.56	5.32	-	-	11.13	6.75	-	-	-	-	13.59	8.05	17.12	5.42	-	-		
5"	141.3	190	262	9.52	9.23	-	-	12.70	12.01	-	-	-	-	15.88	14.64	19.05	8.09	-	-		
6"	168.3	229	313	10.97	15.30	-	-	14.27	19.48	-	-	-	-	18.26	24.28	21.95	11.92	-	-		
8"	219.1	305	414	12.7	30.94	15.09	36.34	18.26	43.29	20.62	48.31	23.01	53.26	22.22	19.46	-	-	-	-		
10"	273	381	518	15.09	57.38	18.26	68.58	21.44	79.52	25.40	92.73	28.58	103.00	25.40	32.17	-	-	-	-		
12"	323.8	457	619	17.48	94.70	21.44	114.65	25.40	134.04	28.58	149.22	33.32	171.17	25.4	58.07	-	-	-	-		
14"	355.6	533	711	19.05	132.24	23.83	163.07	27.79	187.90	31.75	212.09	35.71	235.62	-	-	-	-	-	-		
16"	406.4	607	813	21.44	193.88	26.19	233.91	30.96	273.04	36.53	317.39	40.46	350.00	-	-	-	-	-	-		
18"	457.2	683	914	23.83	272.84	29.36	331.86	34.93	389.68	39.67	437.58	45.24	492.00	-	-	-	-	-	-		
20"	508	759	1116	26.19	370.64	32.54	454.44	38.10	525.86	44.45	605.21	49.99	676.00	-	-	-	-	-	-		
22"	558.8	838	1118	28.57	492.00	34.92	593.27	41.27	694.00	47.62	790.00	53.97	885.00	-	-	-	-	-	-		
24"	610	911	1219	30.96	632.01	38.89	783.02	46.02	915.01	52.37	1029.55	59.51	1160.00	-	-	-	-	-	-		
26"	660	991		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
28"	711	1067		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
30"	762	1143		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
32"	813	1219		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
36"	914	1372		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

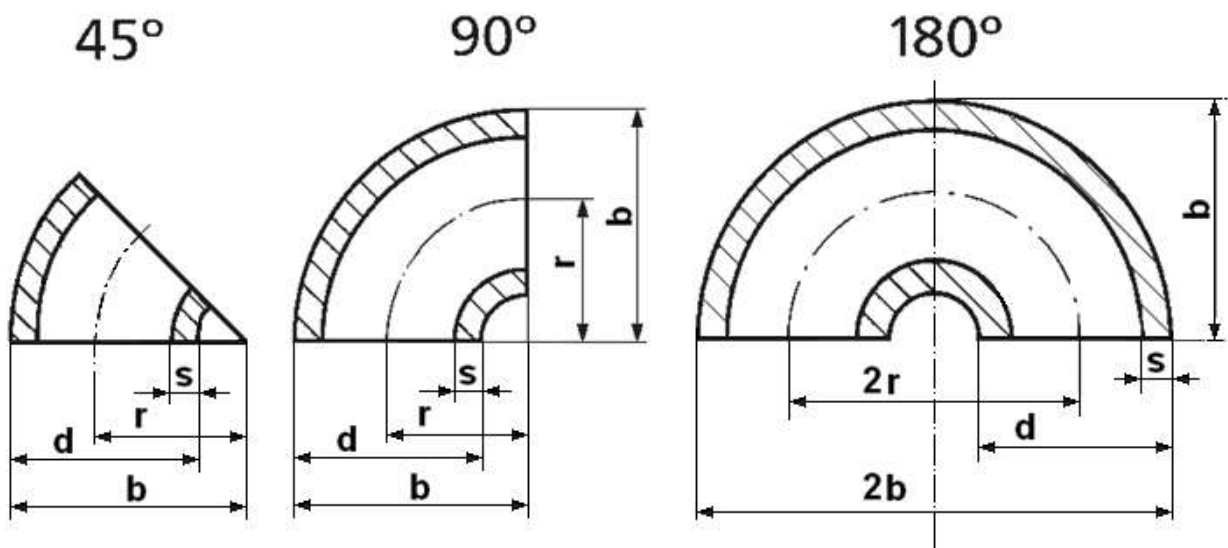
Coturile din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Elbows from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

Coturi si curbe cu alte grosimi ale peretelui: Coturi si curbe cu grosimi ale peretelui diferite de cele specificate in tabelul B 2.1.1. pot fi comandate conform acestui tabel mai putin grosimea „s”.

Other wall thicknesses: Elbows and bends with wall thicknesses other than those specified in table B 2.1.1. may also be ordered in accordance with this table without thickness „s”.

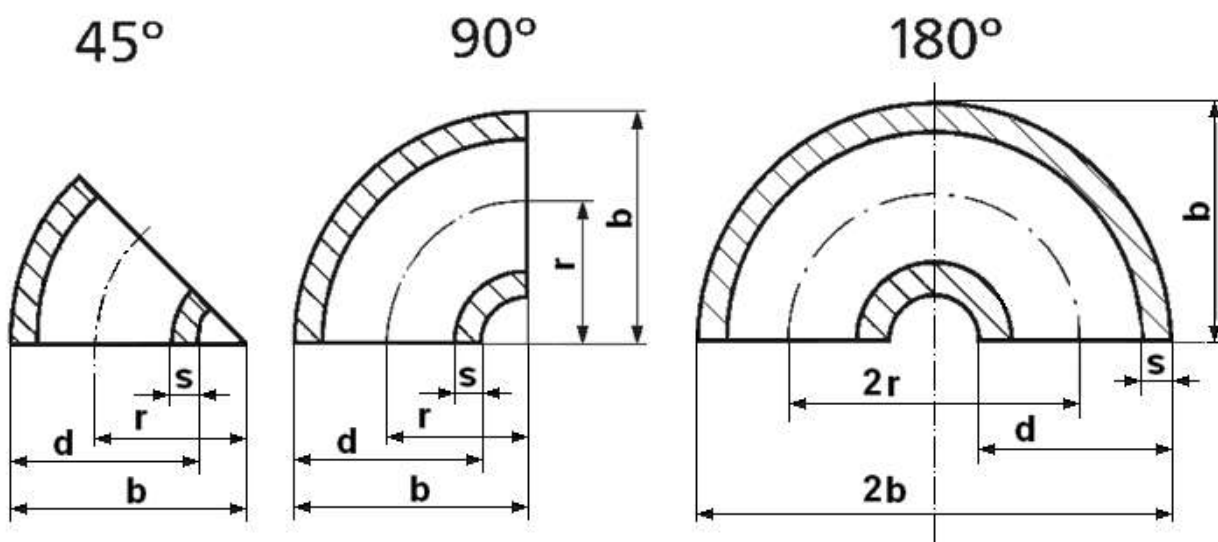
2.1.2. Coturi pentru sudura conform ANSI B16.9 / B16.28 SR
Butt Weld Elbows According to ANSI B16.9 / B16.28 SR



„SR”(short radius) este echivalent cu „ $r \cong 1d$ ”
 „SR”(short radius) are similar to „ $r \cong 1d$ ”

tabel B 2.1.2. table B 2.1.2.

DN țoli	d mm	r mm	b mm	SCH 20			SCH 30			STD			SCH 40			SCH 60			XS		
				s mm	masa kg	weight	s mm	masa kg	weight	s mm	masa kg	weight	s mm	masa kg	weight	s mm	masa kg	weight	s mm	masa kg	weight
1"	33.4	25	41	-	-	-	-	-	3.38	0.10	3.38	0.10	-	-	4.55	0.13					
1¼"	42.2	32	52	-	-	-	-	-	3.56	0.17	3.56	0.17	-	-	4.85	0.22					
1½"	48.3	38	62	-	-	-	-	-	3.68	0.24	3.68	0.24	-	-	5.08	0.32					
2"	60.3	51	81	-	-	-	-	-	3.91	0.44	3.91	0.44	-	-	5.54	0.60					
2½"	73.1	64	100	-	-	-	-	-	5.16	0.87	5.16	0.87	-	-	7.01	1.15					
3"	88.9	76	121	-	-	-	-	-	5.49	1.35	5.49	1.35	-	-	7.62	1.83					
3½"	101.6	89	140	-	-	-	-	-	5.74	1.93	5.74	1.93	-	-	8.08	2.61					
4"	114.3	102	159	-	-	-	-	-	6.02	2.62	6.02	2.62	-	-	8.56	3.58					
5"	141.3	127	197	-	-	-	-	-	6.55	4.42	6.55	4.42	-	-	9.52	6.21					
6"	168.3	152	237	-	-	-	-	-	7.11	6.90	7.11	6.90	-	-	10.97	10.30					
8"	219.1	203	313	6.35	11.16	7.04	12.34	8.18	13.80	8.18	13.80	10.31	17.80	12.70	20.70						
10"	273.0	254	391	6.35	17.48	7.80	31.36	9.27	24.50	9.27	24.50	12.70	32.90	12.70	32.90						
12"	323.8	305	467	6.35	24.97	8.38	32.75	9.52	36.10	10.31	40.05	14.20	54.90	12.70	47.20						
14"	355.6	356	533	7.92	39.80	9.52	47.6	9.52	47.6	11.13	55.45	15.01	74.40	12.70	61.20						
16"	406.4	406	610	7.92	49.7	9.52	59.5	9.52	59.5	12.7	79.33	16.66	102	12.7	79.33						
18"	457.2	457	686	7.92	63.00	11.13	87.9	9.52	75.34	14.27	111.73	19.05	148	12.7	99.79						
20"	508	508	762	9.52	93.5	12.7	124	9.52	93.5	15.06	146	20.62	198	12.7	124						
22"	559	559	838	9.52	113	12.7	150	9.52	113	-	-	22.22	258	12.7	150						
24"	610	610	914	9.52	135	14.27	201	9.52	135	17.45	244	24.59	340	12.7	179.07						
28"	711	711	1067	12.7	244	15.87	304	9.52	184	-	-	-	-	12.7	244						
30"	762	762	1143	12.7	281	15.87	350	9.52	212	-	-	-	-	12.7	281						



tabel B 2.1.2. (Continuare) table B 2.1.2. (Continued)

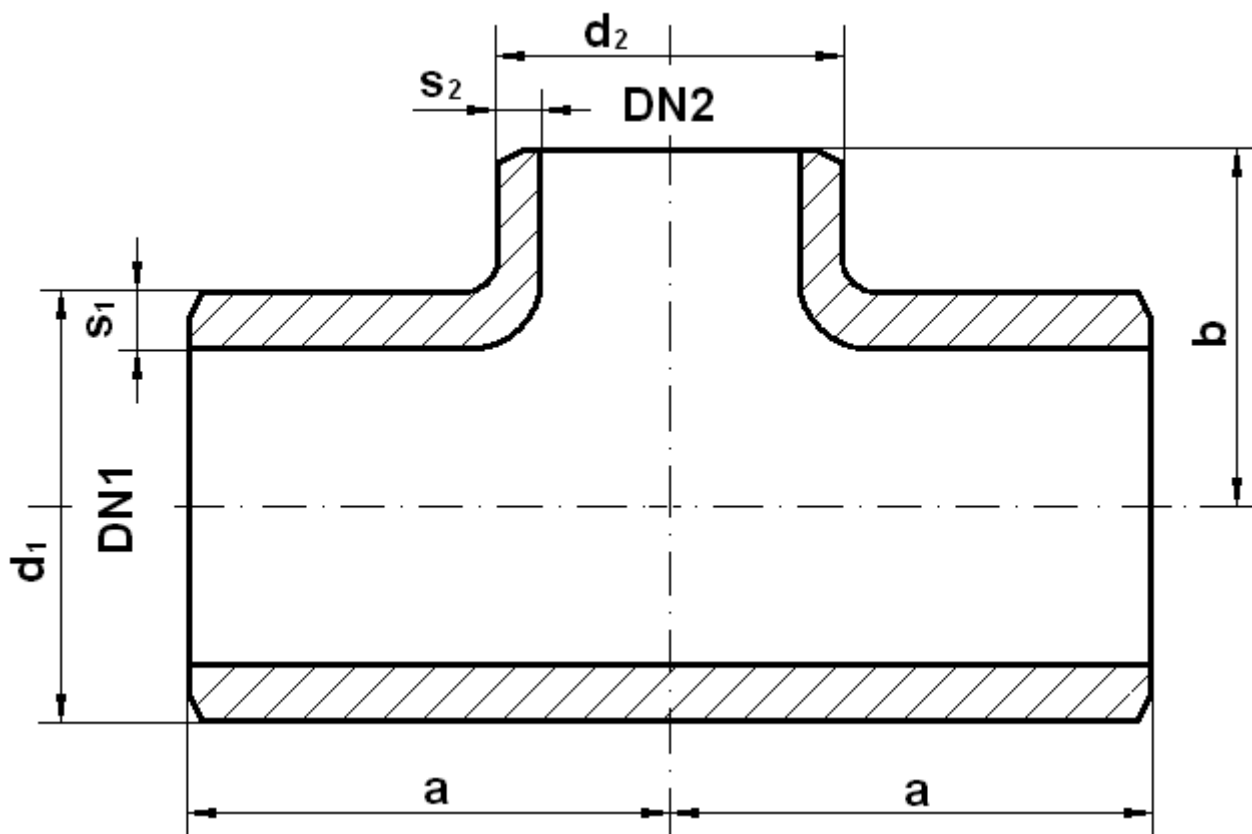
DN toli	d mm	r mm	b mm	SCH 80		SCH 100		SCH 120		SCH 140		SCH 160	
				s mm	masa Weight kg	s mm	masa weight kg	s mm	masa weight kg	s mm	masa weight kg	s mm	masa weight kg
1"	33.4	25	41	4.55	0.13	-	-	-	-	-	-	6.35	0.17
1¼"	42.2	32	52	4.85	0.22	-	-	-	-	-	-	6.35	0.28
1½"	48.3	38	62	5.08	0.32	-	-	-	-	-	-	7.14	0.43
2"	60.3	51	81	5.54	0.60	-	-	-	-	-	-	8.74	0.89
2½"	73.1	64	100	7.01	1.15	-	-	-	-	-	-	9.52	1.50
3"	88.9	76	121	7.62	1.83	-	-	-	-	-	-	11.13	2.56
3½"	101.6	89	140	8.08	2.61	-	-	-	-	-	-	-	-
4"	114.3	102	159	8.56	3.58	-	-	11.13	4.80	-	-	13.49	5.37
5"	141.3	127	197	9.52	6.21	-	-	12.70	8.50	-	-	15.88	9.80
6"	168.3	152	237	10.97	10.30	-	-	14.27	13.60	-	-	-	-
8"	219.1	203	313	12.70	20.70	15.09	25.50	18.26	30.30	20.62	33.80	23.01	35.50
10"	273	254	391	15.09	40.20	18.26	47.90	21.44	55.70	25.40	60.90	28.58	68.7
12"	323.8	305	467	17.48	66.20	21.44	80.20	25.40	93.90	28.58	104.60	33.32	114
14"	355.6	356	533	19.05	92.70	23.83	114.2	27.79	131.70	31.75	148.60	35.71	157
16"	406.4	406	610	21.41	130	26.19	157	30.94	183	36.53	213	40.46	233
18"	457.2	457	686	23.8	183	29.36	222	34.93	261	39.67	293	45.24	330
20"	508	508	762	26.19	248	32.54	304	38.1	352	44.45	405	49.99	451
22"	559	559	838	28.57	328	34.92	396	41.27	462	47.62	527	53.97	590
24"	610	610	914	30.94	423	38.89	524	46.02	612	52.37	689	59.51	773
28"	711	711	1067	-	-	-	-	-	-	-	-	-	-
30"	762	762	1143	-	-	-	-	-	-	-	-	-	-

Coturile din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.
Elbows from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

Coturi si curbe cu alte grosimi ale peretelui: Coturi si curbe cu grosimi ale peretelui diferite de cele specificate in tabelul B 2.1.2. pot fi comandate conform acestui tabel mai putin grosimea „s”.

Other wall thicknesses: Elbows and bends with wall thicknesses other than those specified in table B 2.1.2. may also be ordered in accordance with this table without thickness „s”.

2.2. Teuri pentru sudura conform standardului american ANSI B16.9 Tees for Welding According to American Standard ANSI B16.9



Variante constructive Schedules

- Schedule 20 (Sch 20, S 20)
- Schedule 30 (Sch 30, S 30)
- Schedule 40 (Sch 40, S 40)
- Standard Wall (ST, STD)
- Schedule 60 (Sch 60, S 60)
- Extra Strong (Extra Heavy wall, EH, XH, XS)
- Schedule 80 (Sch 80, S 80)
- Schedule 100 (Sch 100, S 100)
- Schedule 120 (Sch 120, S 120)
- Schedule 140 (Sch 140, S 140)
- Schedule 160 (Sch 160, S 160)
- Double Extra Strong (Double extra heavy wall, XXH, XXS)

Teuri cu alte grosimi ale peretelui: Teuri cu grosimi ale peretelui diferite de cele specificate în tabelul B 2.2. pot fi comandate conform acestui tabel mai puțin grosimile „s1” și „s2”.

Other wall thicknesses: Tees with wall thicknesses other than those specified in table B 2.2. may also be ordered in accordance with this table without thickness „s1” and „s2”.

table B 2.2. table B 2.2.

d1/d2 (to/inch)	d1 mm	d2 mm	a mm	b mm	SCH 20		SCH 30		STD		SCH 40		SCH 60		XS		SCH 80		SCH 100		SCH 120		SCH 140		SCH 160		XXS	
					s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm
1/2" 1/2"	21.3	21.3	25.4	25.4	-	-	-	-	2.77	2.77	-	-	-	-	3.73	3.73	-	-	-	-	-	-	-	-	4.78	4.78	-	-
3/4" 1/2"	26.7	21.3	28.6	28.6	-	-	-	-	2.77	2.77	-	-	-	-	3.91	3.73	-	-	-	-	-	-	-	5.56	4.78	-	-	7.82
3/4" 3/4"	33.4	26.7	38.1	38.1	-	-	-	-	3.38	2.87	3.38	2.87	-	-	4.55	3.91	4.55	3.91	-	-	-	-	-	6.35	5.56	9.09	7.82	9.09
1" 1/2"	42.2	33.4	47.6	47.6	-	-	-	-	3.56	3.38	3.56	3.38	-	-	4.85	3.73	4.85	3.73	-	-	-	-	-	6.35	6.35	-	-	-
1 1/4" 1/2"	48.3	42.2	57.2	57.2	-	-	-	-	3.68	3.56	3.68	3.56	-	-	5.08	4.55	5.08	4.55	-	-	-	-	-	7.14	6.35	10.16	9.09	10.16
1 1/2" 1/2"	60.3	48.3	63.5	63.5	-	-	-	-	3.91	3.68	3.91	3.68	-	-	5.54	4.85	5.54	4.85	-	-	-	-	-	8.74	7.14	11.03	10.16	11.07
2" 3/4"	88.9	60.3	85.7	85.7	-	-	-	-	5.49	5.16	5.49	5.16	-	-	7.62	6.91	7.62	6.91	-	-	-	-	-	11.13	9.52	15.24	14.02	15.24
2" 1"	88.9	60.3	85.7	85.7	-	-	-	-	5.49	5.16	5.49	5.16	-	-	7.62	6.91	7.62	6.91	-	-	-	-	-	11.13	9.52	15.24	14.02	15.24
2" 1 1/4"	88.9	60.3	85.7	85.7	-	-	-	-	5.49	5.16	5.49	5.16	-	-	7.62	6.91	7.62	6.91	-	-	-	-	-	11.13	9.52	15.24	14.02	15.24
2" 1 1/2"	88.9	60.3	85.7	85.7	-	-	-	-	5.49	5.16	5.49	5.16	-	-	7.62	6.91	7.62	6.91	-	-	-	-	-	11.13	9.52	15.24	14.02	15.24
2 1/2" 1 1/2"	88.9	60.3	85.7	85.7	-	-	-	-	5.49	5.16	5.49	5.16	-	-	7.62	6.91	7.62	6.91	-	-	-	-	-	11.13	9.52	15.24	14.02	15.24
2 1/2" 2"	88.9	60.3	85.7	85.7	-	-	-	-	5.49	5.16	5.49	5.16	-	-	7.62	6.91	7.62	6.91	-	-	-	-	-	11.13	9.52	15.24	14.02	15.24
2 1/2" 2 1/2"	88.9	60.3	85.7	85.7	-	-	-	-	5.49	5.16	5.49	5.16	-	-	7.62	6.91	7.62	6.91	-	-	-	-	-	11.13	9.52	15.24	14.02	15.24
3" 1"	88.9	60.3	85.7	85.7	-	-	-	-	5.49	5.16	5.49	5.16	-	-	7.62	6.91	7.62	6.91	-	-	-	-	-	11.13	9.52	15.24	14.02	15.24
3" 1 1/4"	88.9	60.3	85.7	85.7	-	-	-	-	5.49	5.16	5.49	5.16	-	-	7.62	6.91	7.62	6.91	-	-	-	-	-	11.13	9.52	15.24	14.02	15.24
3" 1 1/2"	88.9	60.3	85.7	85.7	-	-	-	-	5.49	5.16	5.49	5.16	-	-	7.62	6.91	7.62	6.91	-	-	-	-	-	11.13	9.52	15.24	14.02	15.24
3" 2"	88.9	60.3	85.7	85.7	-	-	-	-	5.49	5.16	5.49	5.16	-	-	7.62	6.91	7.62	6.91	-	-	-	-	-	11.13	9.52	15.24	14.02	15.24
3" 2 1/2"	88.9	60.3	85.7	85.7	-	-	-	-	5.49	5.16	5.49	5.16	-	-	7.62	6.91	7.62	6.91	-	-	-	-	-	11.13	9.52	15.24	14.02	15.24
3" 3"	88.9	60.3	85.7	85.7	-	-	-	-	5.49	5.16	5.49	5.16	-	-	7.62	6.91	7.62	6.91	-	-	-	-	-	11.13	9.52	15.24	14.02	15.24

tabel B 2.2. (Continuare) table B 2.2. (Continued)

d1/d2 (toli) d1/d2 (inch)	d1 mm	d2 mm	a mm	b mm	SCH 20		SCH 30		STD		SCH 40		SCH 60		XS		SCH 80		SCH 100		SCH 120		SCH 140		SCH 160		XXS		
					s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm
4" 1 1/2"		48.3		85.7					3.68							5.08													
4" 2"		60.3		88.9				3.91								5.54													
4" 2 1/2"	114.3	73.1	104.8	95.3				6.02								8.56													
4" 3"		88.9		98.4				5.49								7.62													
4" 4"		114.3		104.8				6.02								8.56													
5" 2"		60.3		104.8				3.91								5.54													
5" 2 1/2"		73.1		108				5.16								7.01													
5" 3"	141.3	88.9	124	111.1				5.49								9.52													
5" 4"		114.3		117.5				6.02								8.56													
5" 5"		141.3		123.8				6.55								9.52													
6" 2 1/2"		73.1		120.7				5.16								7.01													
6" 3"		88.9		123.8				5.49								7.62													
6" 4"	168.3	114.3	142.9	130.2				6.02								10.97													
6" 5"		141.3		136.5				6.55								9.52													
6" 6"		168.3		142.9				7.11								10.97													
8" 3"		88.9		152.4				5.49								7.62													
8" 4"		114.3		155.6				6.02								8.56													
8" 5"	219.1	141.3	177.8	161.9				8.18								12.7													
8" 6"		168.3		168.3				7.11								10.97													
8" 8"		219.1		177.8				8.18								12.70													
10" 4"		114.3		184.2				6.02								8.56													
10" 5"		141.3		190.5				6.55								9.52													
10" 6"	273.0	168.3	215.9	193.7				7.11								10.97													
10" 8"		219.1		203.2				8.18								12.70													
10" 10"		273.0		215.9				9.27								15.09													
12" 5"		141.3		215.9				6.55								9.52													
12" 6"		168.3		219.1				7.11								10.97													
12" 8"	323.8	219.1	254	228.6				8.18								12.70													
12" 10"		273.0		241.3				9.27								12.70													
12" 12"		323.9		254				9.52								12.70													

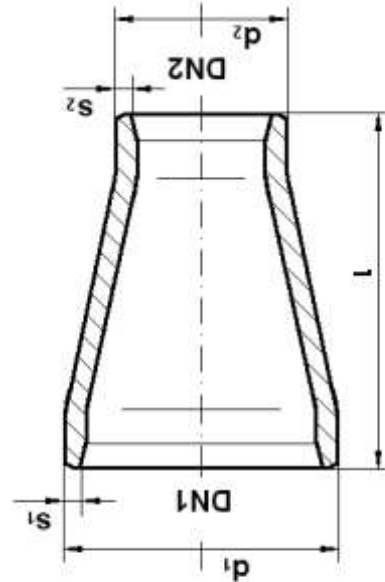
tabel B 2.2. (Incheiere) *table B 2.2. (Concluded)*

d1/d2 (toli)	d1/d2 (inch)	d1 mm	d2 mm	a mm	b mm	SCH 20		SCH 30		STD		SCH 40		SCH 60		XS		SCH 80		SCH 100		SCH 120		SCH 140		SCH 160		XXS	
						s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm
14" 6"			168.3		238.1					7.11						10.97													
14" 8"			219.1		247.7					8.18						12.70													
14" 10"	355.6		273.0	279.4	257.2				9.52	9.27						12.70	19.05												
14" 12"			323.9		269.9				9.52	9.52						12.70													
14" 14"			355.6		279.4				9.52	9.52						12.70													
16" 6"			168.3		263.3				7.11							10.97													
16" 8"			219.1		273.1				8.18							12.70													
16" 10"	406.4		273.0	304.8	282.6				9.52	9.27						12.70	21.44												
16" 12"			323.9		295.3				9.52	9.52						12.70													
16" 14"			355.6		304.8				9.52	9.52						12.70													
16" 16"			406.4		304.8				9.52	9.52						12.70													
18" 8"			219.1		298.5				8.18							12.70													
18" 10"			273.0		308.0				9.27							12.70													
18" 12"	457.2		323.9	342.9	320.7				9.52	9.52						12.70	23.83												
18" 14"			355.6		330.2				9.52	9.52						12.70													
18" 16"			406.4		330.2				9.52	9.52						12.70													
18" 18"			457.2		342.9				9.52	9.52						12.70													
20" 8"			219.1		323.9				8.18							12.70													
20" 10"			273.0		333.4				9.27							12.70													
20" 12"			323.9		346.1				9.52							12.70													
20" 14"	508		355.6	381	355.6				9.52	9.52						12.70	26.19	19.05	32.54										
20" 16"			406.4		355.6				9.52	9.52						12.70													
20" 18"			457.2		368.3				9.52	9.52						12.70													
20" 20"			508		381				9.52	9.52						12.70													
22" 16"	558.8		406.4	419	381				9.52							12.70													
22" 22"			558.8		419				9.52							12.70													
24" 10"			273.0		384.2				9.27							12.70													
24" 12"			323.9		396.9				9.52							12.70													
24" 14"			355.6		406.4				9.52							12.70													
24" 16"	609.6		406.4	431.8	406.4				9.52	9.52						12.70	30.96												
24" 18"			457.2		419.1				9.52							12.70													
24" 20"			508		431.8				9.52							12.70													
24" 24"			609.6		431.8				9.52							12.70													

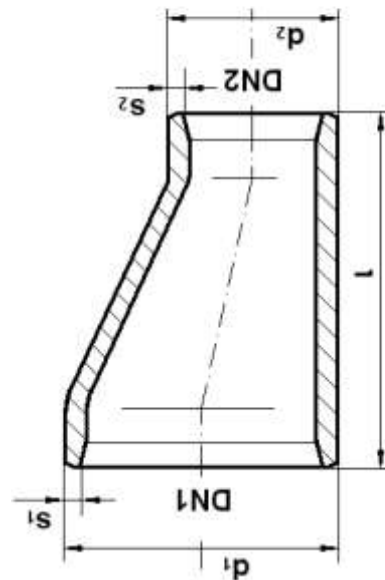
2.3. Reductii pentru sudura conform standardului american ANSI B16.9 Reducers for Welding According to American Standard ANSI B16.9

d1/d2 (toli)	d1 mm	d2 mm	l mm	SCH 20		SCH 30		STD		SCH 40		SCH 60		XS		SCH 80		SCH 100		SCH 120		SCH 140		SCH 160		XXS	
				s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm
1/2" > 3/8"	21.3	17.1	38.1	-	-	-	-	2.77	2.31	2.77	2.31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3/4" > 3/8"	26.7	17.1	38.1	-	-	-	-	2.87	2.31	2.87	2.31	-	-	3.91	-	-	-	-	-	-	-	-	-	-	-	-	-
3/4" > 1/2"	26.7	21.3	38.1	-	-	-	-	2.77	2.77	2.87	2.77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1" > 1/2"	33.4	21.3	50.8	-	-	-	-	3.38	2.77	3.38	2.77	-	-	4.55	3.73	3.73	4.55	-	-	-	-	-	-	6.35	4.78	-	-
1" > 3/4"	33.4	26.7	50.8	-	-	-	-	2.87	2.77	2.87	2.77	-	-	3.91	3.91	3.91	3.91	-	-	-	-	-	-	6.35	5.56	-	-
1 1/4" > 1/2"	42.2	21.3	50.8	-	-	-	-	3.56	2.77	3.56	2.77	-	-	4.85	3.73	3.73	4.85	-	-	-	-	-	-	6.35	5.53	-	-
1 1/4" > 3/4"	42.2	26.7	50.8	-	-	-	-	3.38	2.87	3.38	2.87	-	-	4.55	3.91	3.91	4.55	-	-	-	-	-	-	6.35	6.35	-	-
1 1/4" > 1"	42.2	33.4	50.8	-	-	-	-	3.56	3.38	3.56	3.38	-	-	4.85	4.85	4.85	4.85	-	-	-	-	-	-	7.14	7.14	-	-
1 1/2" > 1 1/4"	42.2	42.2	63.5	-	-	-	-	3.56	3.38	3.56	3.38	-	-	4.85	4.85	4.85	4.85	-	-	-	-	-	-	7.14	7.14	-	-
2" > 1/2"	60.3	21.3	76.2	-	-	-	-	2.77	2.77	2.77	2.77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2" > 3/4"	60.3	26.7	76.2	-	-	-	-	2.87	2.87	2.87	2.87	-	-	3.91	3.91	3.91	3.91	-	-	-	-	-	-	5.56	5.56	7.82	-
2" > 1"	60.3	33.4	76.2	-	-	-	-	3.91	3.38	3.91	3.38	-	-	5.54	5.54	5.54	5.54	-	-	-	-	-	-	8.74	6.35	11.07	-
2" > 1 1/4"	60.3	42.2	76.2	-	-	-	-	3.56	3.56	3.56	3.56	-	-	4.85	4.85	4.85	4.85	-	-	-	-	-	-	6.35	6.35	-	-
2" > 1 1/2"	60.3	48.3	76.2	-	-	-	-	3.68	3.68	3.68	3.68	-	-	5.08	5.08	5.08	5.08	-	-	-	-	-	-	7.14	7.14	-	-
2 1/2" > 1"	73.1	33.4	88.9	-	-	-	-	3.38	3.38	3.38	3.38	-	-	4.55	4.55	4.55	4.55	-	-	-	-	-	-	-	-	-	-
2 1/2" > 1 1/4"	73.1	42.2	88.9	-	-	-	-	3.56	3.56	3.56	3.56	-	-	4.85	4.85	4.85	4.85	-	-	-	-	-	-	6.35	6.35	-	-
2 1/2" > 1 1/2"	73.1	48.3	88.9	-	-	-	-	3.68	3.68	3.68	3.68	-	-	5.08	5.08	5.08	5.08	-	-	-	-	-	-	7.14	7.14	-	-
2 1/2" > 2"	73.1	60.3	88.9	-	-	-	-	3.91	3.91	3.91	3.91	-	-	5.54	5.54	5.54	5.54	-	-	-	-	-	-	8.74	8.74	-	-

tabel B 2.3. table B 2.3.



2. Reductie concentrica (Concentric reducer)



1. Reductie excentrica (Eccentric reducer)

tabel B 2.3. (Continuare) table B 2.3. (Continued)

d1/d2 (foli) d1/d2 (inch)	d1 mm	d2 mm	I mm	SCH 20		SCH 30		STD		SCH 40		SCH 60		XS		SCH 80		SCH 100		SCH 120		SCH 140		SCH 160		XXS		
				s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm
3" > 1"		33.4																										
3" > 1 1/4"		42.2																										
3" > 1 1/2"	88.9	48.3	88.9																									
3" > 2"		60.3																										
3" > 2 1/2"		73.1																										
4" > 1 1/2"		48.3																										
4" > 2"		60.3																										
4" > 2 1/2"	114.3	73.1	101.6																									
4" > 3"		88.9																										
5" > 2"		60.3																										
5" > 2 1/2"		73.1																										
5" > 3"	141.3	88.9	127																									
5" > 4"		114.3																										
6" > 2"		60.3																										
6" > 2 1/2"		73.1																										
6" > 3"		88.9																										
6" > 3 1/2"	168.3	101.6	139.7																									
6" > 4"		114.3																										
6" > 5"		141.3																										
8" > 3"		88.9																										
8" > 4"		114.3																										
8" > 5"	219.1	141.3	152.4																									
8" > 6"		168.3																										
10" > 4"		114.3																										
10" > 5"		141.3																										
10" > 6"	273.0	168.3	177.8																									
10" > 8"		219.1																										
12" > 5"		141.3																										
12" > 6"		168.3																										
12" > 8"	323.9	219.1	203.2																									
12" > 10"		273.0																										

tabel B 2.3. (Incheiere) table B 2.3. (Concluded)

d1/d2 (foli)	d1 mm	d2 mm	I mm	SCH 20		SCH 30		STD		SCH 40		SCH 60		XS		SCH 80		SCH 100		SCH 120		SCH 140		SCH 160		XXS		
				s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm	s2 mm	s1 mm
14"> 6"		168.3						7.11						10.97														
14"> 8"		219.1						8.18						12.70														
14"> 10"	355.6	273.0	330.2	9.52	11.13			9.27						12.70	19.05													
14"> 12"		323.9						9.52	10.31					12.70														
16"> 8"		219.1						8.18						12.70														
16"> 10"		273.0						9.27						12.70														
16"> 12"	406.4	323.9	355.6	9.52				9.52						12.70								36.53						
16"> 14"		355.6						9.52						12.70														
18"> 10"		273.0						9.27						12.70														
18"> 12"		323.9						9.52						12.70														
18"> 14"	457.2	355.6	381.0	9.52				9.52						12.70														
18"> 16"		406.4						9.52						12.70														
20"> 12"		323.9						9.52						12.70														
20"> 14"		355.6						9.52	15.09					12.70														
20"> 16"	508	406.4	508	9.52				9.52	12.70					12.70														
20"> 18"		457.2						9.52	14.27					12.70														
22"> 20"	558.8	508	508	9.52				9.52						12.70														
24"> 14"		355.6						9.52						-														
24"> 16"		406.4						9.52						12.70														
24"> 18"	609.6	457.2	508	9.52				9.52						12.70	30.96													
24"> 20"		508						9.52						12.70														

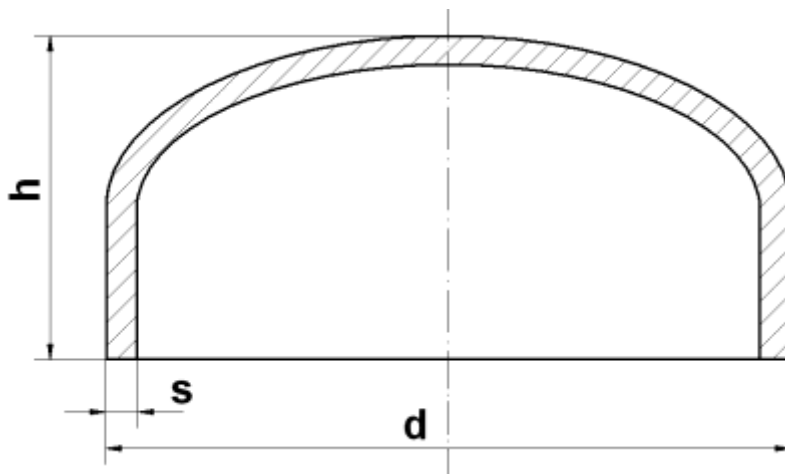
Reductiile din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda. -

Reducers from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

Reductii cu alte grosimi ale peretelui: Reductii cu grosimi ale peretelui diferite de cele specificate in tabelul B 2.3. pot fi comandate conform acestui tabel mai putin grosimile „s1” si „s2”.

Other wall thicknesses: Reducers with wall thicknesses other than those specified in table B 2.3. may also be ordered in accordance with this table without thickness „s1” and „s2”.

2.4. Capace pentru sudura conform standardului american ANSI B16.9 Caps for Welding According to American Standard ANSI B16.9



Variante constructive Schedule

- Schedule 20 (Sch 20, S 20)
- Standard Wall (ST, STD)
- Schedule 60 (Sch 60, S 60)
- Extra Strong (Extra Heavy wall, EH, XH, XS)
- Schedule 160 (Sch 160, S 160)
- Double Extra Strong (Double extra heavy wall, XXH, XXS)

tabel B 2.4. table B 2.4.

DN țoli	d mm	h mm	SCH 20		STD		SCH 60			XS		SCH 160		XXS	
			s mm	masa weight kg	s mm	masa weight kg	s mm	masa weight kg	s mm	masa weight kg	s mm	masa weight kg	s mm	masa weight kg	
1/2"	21.3	25.4	-	-	2.77	0.03	-	-	3.73	0.04	-	-	-	-	
		25.9	-	-	-	-	-	-	-	-	4.78	0.06	-	-	
3/4"	26.7	25.4	-	-	2.87	0.06	-	-	3.91	0.07	-	-	-	-	
1"	33.4	38.1	-	-	3.38	0.1	-	-	4.35	0.13	6.35	0.15	-	-	
1 1/4"	42.2	38.1	-	-	3.56	0.14	-	-	4.85	0.18	-	-	-	-	
1 1/2"	48.3	38.1	-	-	3.68	0.17	-	-	5.08	0.22	7.14	0.30	10.16	0.35	
2"	60.3	38.1	-	-	3.91	0.23	-	-	5.54	0.30	8.74	0.55	11.07	0.60	
2 1/2"	73.1	38.1	-	-	5.16	0.37	-	-	7.01	0.46	9.52	0.90	-	-	
3"	88.9	50.8	-	-	5.49	0.64	-	-	7.62	0.84	11.13	1.45	-	-	
4"	114.3	63.5	-	-	6.02	1.16	-	-	8.56	1.55	13.49	2.75	-	-	
5"	141.3	76.2	-	-	6.55	1.91	-	-	9.52	2.61	-	-	-	-	
6"	168.3	88.9	-	-	7.11	2.91	-	-	10.97	4.19	-	-	-	-	
8"	219.1	101.6	6.35	4.50	8.18	5.50	10.31	7.00	12.70	7.40	-	-	-	-	
10"	273	127	-	-	9.27	9.08	-	-	12.70	11.90	-	-	-	-	
12"	323.8	152.4	-	-	9.52	13.40	-	-	12.70	17.30	-	-	-	-	
14"	355.6	165.1	-	-	9.52	16.00	-	-	12.70	20.80	-	-	-	-	
16"	406.4	177.8	-	-	9.52	20.10	-	-	12.70	26.10	16.66	40.75	-	-	
18"	457.2	203.2	-	-	9.52	25.90	-	-	12.70	33.90	19.05	66.00	-	-	
20"	508	228.6	-	-	9.52	32.50	-	-	12.70	42.60	-	-	-	-	
24"	610	266.7	-	-	9.52	46.30	-	-	12.70	60.80	-	-	-	-	

Capacele din otel carbon sau din inox care nu sunt pe stoc pot fi livrate in 10-15 zile de la comanda.

Caps from carbon steel or stainless steel not in stock can be delivered in about 10-15 days.

Capace cu alte grosimi ale peretelui: Capace cu grosimi ale peretelui diferite de cele specificate in tabelul B 2.4. pot fi comandate conform acestui tabel mai putin grosimea „s”.

Other wall thicknesses: Caps with wall thicknesses other than those specified in table B 2.4. may also be ordered in accordance with this table without thickness „s”.

3. Fitinguri pentru sudura conform standardelor romanesti *Butt Welding Fittings According to Romanian Standards*

3.1. Curbe pentru sudura conform STAS 830-70 *Bends for Welding According to STAS 830-70*

Sunt coturi cu raza mare $r = 2.5-5DN$ care se prelungesc cu doua brate de legatura. Capetele sunt drepte, filetate sau tesite. Se utilizeaza in industria petroliera si in constructiile industriale.

Se executa cu 4 raze de curbura :

- $r = 2.5 DN$;
- $r = 3 DN$;
- $r = 4 DN$;
- $r = 5 DN$.

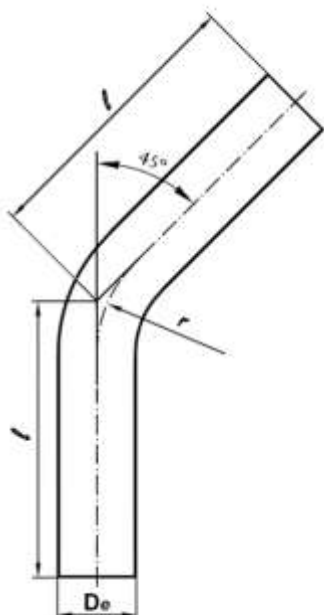
Fiecare tip de curba poate avea 3 forme: la 45° , la 90° ; si la 180° .

There are large radius elbows $r = 2.5 \div 5ND$ heaving longer heads. The ends are straight, threaded or bevelled. They are used in the petroleum and industrial buildings.

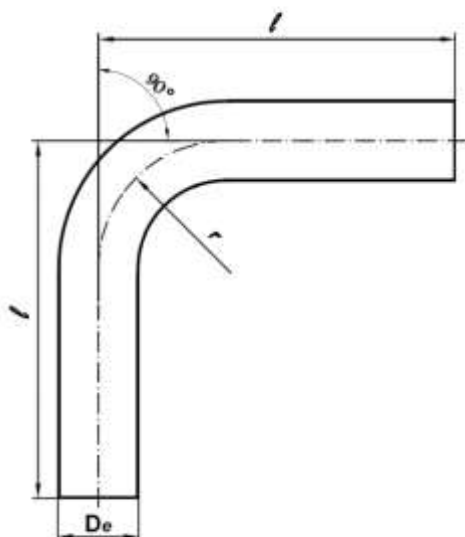
The bends are made on 4 radius:

- $r = 2.5ND$;
- $r = 3ND$;
- $r = 4ND$;
- $r = 5ND$.

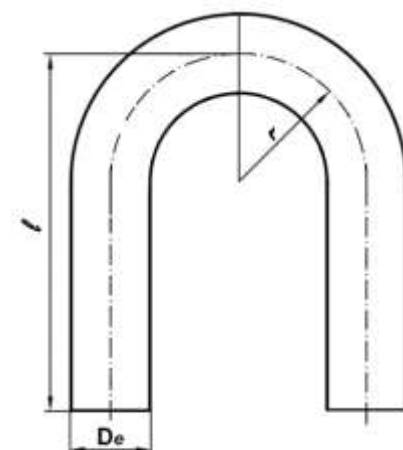
Each type of bend can have three forms: to 45° , to 90° and to 180° .



Curba la 45°



Curba la 90°



Curba la 180°

3.1.1. Curbe pentru sudura tip 2.5DN (trasa la rece) Bends for Welding Type 2.5ND

tabel B 3.1.1. table B 3.1.1.

DN	De	r	lungimea bratelor l (mm)			lungimea desfasurata (mm)		
ND	OD		pipe arms length			unfolded length (mm)		
mm	mm	mm	45°	90°	180°	45°	90°	180°
100	108.0	250	955	1010	1010	1910	2110	2505
	114.0							
	114.3							
125	133.0	310	980	1170	1170	1965	2200	2690
150	159.0	375	1000	1235	1235	2015	2310	2900
	168.0							
	168.3							
200	219.0	500	1050	1365	1365	2110	2510	3310
	219.1							
250	273	625	1100	1485	1485	2210	2700	3680
300	323.8	750	1145	1610	1610	2310	2900	4080
	324.0							

3.1.2. Curbe pentru sudura tip 3DN (trasa la cald si la rece) Bends for Welding Type 3ND

tabel B 3.1.2. table B 3.1.2.

DN	De	r	lungimea bratelor l (mm)			lungimea desfasurata (mm)		
ND	OD		pipe arms length			unfolded length (mm)		
mm	mm	mm	45°	90°	180°	45°	90°	180°
8	13.7	25	50	65	65	100	120	180
10	17.1	30	50	70	70	105	150	195
15	21.3	45	60	85	85	115	150	220
20	28.0	60	65	100	100	130	175	270
25	32.0	75	80	125	125	160	220	335
32	42.0	100	110	170	170	220	300	455
	42.2							
40	48.0	125	140	215	215	300	395	590
	48.3							
50	57.0	150	205	225	225	415	535	770
	60.0							
	60.3							
65	75.5	200	275	300	300	555	715	1030
80	83.0	225	310	340	340	625	800	1155
	88.5							
	88.9							
100	101.6	300	415	450	450	835	1070	1540
	102.0							
	114.0							
	114.3							
	121.0							
125	133.0	375	520	560	560	1050	1340	1930
	139.7							
	140.0							
150	168.0	450	625	675	675	1250	1610	2310
	168.3							
200	219.0	600	830	900	900	1670	2140	3080
	219.1							
250	273	750	1040	1125	1125	2090	2680	3860
300	323.8	900	1245	1350	1350	2500	3200	4620
	324.0							

3.1.3. Curbe pentru sudura tip 4DN (trasa la rece) Bends for Welding Type 4ND

tabel B 3.1.3. table B 3.1.3.

DN	De	r	lungimea bratelor l (mm)			lungimea desfasurata (mm)		
ND	OD		pipe arms length			unfolded length (mm)		
mm	mm	mm	45°	90°	180°	45°	90°	180°
100	108.0	400	1015	1260	1260	2030	2350	2975
	114.0							
	114.3							
125	133.0	500	1050	1360	1360	2110	2500	3290
150	159.0	600	1090	1460	1460	2190	2660	3600
	168.0							
	168.3							
200	219.0	800	1170	1660	1660	2350	2970	4225
	219.1							
250	273	1000	1240	1860	1860	2500	3290	4860
300	323.8	1200	1320	2060	2060	2660	3600	5490
	324.0							

3.1.4. Curbe pentru sudura tip 5DN (trasa la cald si la rece) Bends for Welding Type 5ND

tabel B 3.1.4. table B 3.1.2.

DN	De	r	lungimea bratelor l (mm)			lungimea desfasurata (mm)		
ND	OD		pipe arms length			unfolded length (mm)		
mm	mm	mm	45°	90°	180°	45°	90°	180°
8	13.7	40	55	80	80	115	145	205
10	17.1	50	60	90	90	120	160	240
15	21.3	75	75	125	125	160	220	335
20	28.0	110	90	150	150	180	260	415
25	32.0	125	105	185	185	215	320	515
32	42.0	160	125	225	225	255	380	630
	42.2							
40	48.0	200	140	265	265	290	455	760
	48.3							
50	60.0	250	170	325	325	250	542	935
	60.3							
65	75.5	325	225	425	425	445	705	1225
	83.0							
80	88.5	400	275	520	520	552	865	1490
	88.9							
	95.0							
100	108.0	500	350	650	650	692	1085	1870
	114.0							
	114.3							
125	139.7	625	430	810	810	865	1355	2325
	140.0							
150	168.0	750	515	975	975	1265	1630	2800
	168.3							
200	219.0	1000	685	130	130	1385	2170	3740
	219.1							
250	273.0	1250	855	1625	1625	1730	2710	4670
300	323.8	1500	1025	1950	1950	2075	3250	5600
	324.0							
350	377.0	1750	1200	2275	2275	2425	3800	6550
400	426.0	2000	1365	2600	2600	2700	4340	7480

C. OTELURI - CALITATI

STEEL GRADES

1. Oteluri carbon Carbon Steels

1.1. Oteluri carbon comparabile pentru instalatii de tubulatura Comparative Carbon Steels for Tubes and Pipes Installations

XXXXX OTELURI PENTRU TEMPERATURI INALTE
XXXXX OTELURI PENTRU TEMPERATURI JOASE
OTELURI PENTRU RECIPIENTI SUB PRESIUNE

CARBON STEEL FOR HEAT TEMPERATURES
CARBON STEEL FOR LOW TEMPERATURES
CARBON STEEL FOR PRESSURE VESSEL

tabel C 1.1. table C 1.1.

Werkstoff	Germany (DIN; SEW)			E.U. (EN)			U.S.A. (ANSI; ASTM)			Romania (STAS)		
	Tevi Pipe	Fitinguri Fittings	Flanse Flanges	Tevi Pipe	Fitinguri Fittings	Flanse Flanges	Tevi Pipe	Fitinguri Fittings	Flanse Flanges	Tevi Pipe	Fiting. Fittings	Flanse Flanges
1.0033			St 33.1									OL30
1.0034	RSt 34.2	RSt 34.2										
1.0035	St 33	St 33	St 33.2	S185		S185						OL30, 32, 34
1.0036			USt 37.2			S235JRG1	1015/283 Gr.C		A570-M-98 Gr.36 Type1			OL37.2
1.0037	St 37.2		St 37.2			S235JR	1015/283 Gr.C		A570-M-98 Gr.36 Type1			
1.0038	RSt 37.2	RSt 37.2	RSt 37.2	S235JRG2	S235JRG2	S235JRG2	A570 Gr.36			OL37 2K	OL37 2K	OL37 2K
1.0039	RSt 37.2	RSt 37.2	RSt 37.2	S235JRH	S235JRH	S235JRH	A570 Gr.36			OL37 2K	OL37 2K	OL37 2K
1.0040			USt 42.2									OL42.2
1.0042			RSt 42.2									OL42.2K
1.0044	St 44.2	St 44.2				S275JR						OL 44.2K
1.0045				S355JR		S355JR						OL52.2K
1.0050			St 50.2			E295						OL50(K)
1.0055			USt.34.1									OL34.1
1.0060			St 60.2			E335						OL60(K)
1.0065			USt.37.1									OL37.1
1.0070			St 70.2			E360						OL70(K)
1.0075			USt 42.1									OL42.1
1.0077			RSt 42.1									OL42.1K
1.0114						S235J0						(OL37.3K) (OL37.3Kf)
1.0116			St37.3	S235J2G3		S235J2G3						OL37.3Kf OL37.4
1.0117				S235J2G4 S235J2+N		S235J2G4 S235J2+N			A570-M-98 Gr.36 Type1			OL37.4Kf +N
1.0136			St 42.3									OL42.3
1.0138				S275J2H						OL44.kf		
1.0143				S275J0	S275J0	S275J0						OL44.3K OL44.3Kf
1.0144				S275J2G3		S275J2G3						OL44.3Kf
1.0145				S275J2G4 S275J2+N		S275J2G4 S275J2+N						OL44.4Kf+N
1.0149				S275J0H	S275J0H	S275J0H				OL44.3K OL44.3Kf	OL44.3K OL44.3Kf	OL44.3K OL44.3Kf
1.0211	St 30 Si											
1.0212	St 30 Al											
1.0253	USt 37.0	USt 37.0										
1.0254	St 37.0	St 37.0		P235TR1	P235TR1							
1.0255	St 37.4	St 37.4		P195GH	P195GH							
1.0256	St 44.0	St 44.0										
1.0257	St 44.4	St 44.4										
1.0305	St 35.8/I	St 35.8/I	C21	P235GH	P235GH		A106 Gr.A	A234-WPA	A105 Gr.I	R360 OLT35K	OLT35K	
1.0306	TT St 35N	TT St 35N										
1.0308	St 35	St 35					A252 Gr.A	A252 Gr.A		OLT35	OLT35	
1.0315	St 37.8	St 37.8										
1.0345				P235GH	P235GH							R360

tabel C 1.1. (Continuare) table C 1.1. (Continued)

Werkstoff	Germany (DIN; SEW)			E.U. (EN)			U.S.A. (ANSI; ASTM)			Romania (STAS)		
	Tevi Pipe	Fitinguri Fittings	Flanse Flanges	Tevi Pipe	Fitinguri Fittings	Flanse Flanges	Tevi Pipe	Fitinguri Fittings	Flanse Flanges	Tevi Pipe	Fiting. Fittings	Flanse Flanges
1.0346			AST35									R37
1.0352				P245GH*	P245GH*	P245GH*						
1.0356	TTSst 35N	TTSst 35N	TTSst 35N									
1.0356	TTSst 35N	TTSst 35N	TTSst 35N							OLT35R R37	OLT35R R37	OLT35R R37
1.0402	C22	C22										
1.0405	St 45.8/I	St 45.8		P265GH	P265GH		A106 Gr. B	A234-WPB	A105	OLT45K	OLT45K	
							A106 Gr. C	A234 WPC	A105			
1.0406			C25*									
1.0408	St 45	St 45					A252 Gr.B	A252 Gr.B		OLT45	OLT45	
										OLT65	OLT65	
	St 55	St 55								OLT55	OLT55	
1.0418				EN10208-2 L245MB			A 984A984M Gr. 35					
1.0421	St 52.0	St 52.0				P355T1						
1.0425						P265GH						K410
1.0426				P280GH*	P280GH*	P280GH*						
1.0429				EN10208-2 L290MB								
1.0432			C21				A106	A234-WPB	A105 Gr.II			
1.0436			AST45	P305GH*	P305GH*	P305GH*						R44
1.0437			TT St 41			P310NB			A350-LF1			
1.0457				EN10208-2 L245NB								
1.0458				EN10208-1 L235GA								
1.0459				EN10208-1 L245GA								
1.0460	C22.8			P245GH (1.0352)			M1023					
1.0461	St E255											
1.0462	Wt E255											
1.0463	TSt E255											
1.0473				P355GH	P355GH					R510(K510)	R510(K510)	
1.0477	RSt 46.2	RSt 46.2	RSt 46.2	P285NH*	P285NH*	P285NH*				OL44.2(K)	OL44.2(K)	OL44.2(K)
1.0478				P285QH*	P285QH*	P285QH*				OL44.2(K)	OL44.2(K)	OL44.2(K)
1.0481			17Mn4			P295GH						K460(K47)
1.0483	St 46.3	St 46.3	St 46.3	EN10208-1 L290GA			X42 PSL1	X42 PSL1		OL44.3(K)	OL44.3(K)	OL44.3(K)
1.0484	St E290.7			EN10208-2 L290NB			API STD5LX/X42	WPY42-II	A182-F1			
1.0486	St E285	St E285		P275N**	P275N**	P275N**	A333 Gr.6	A420-WPL6	A350-LP2			
1.0487	Wt E285	Wt E285		P275NH**	P275NH**	P275NH**						
1.0487												
1.0488	TSt E285	TSt E285		P275NL1**	P275NL1**	P275NL1**						
1.0490						S275N						
1.0491						S275NL						
1.0498	St 42.8	St 42.8										
1.0499				EN10208-1 L360GA								
1.0501	C35									OLC35		
1.0512				S355K2H	S355K2H	S355K2H				OL52.4Kf	OL52.4Kf	OL52.4Kf
1.0547				S355J0H	S355J0H	S355J0H				OL52.3K	OL52.3K	OL52.3K
1.0553				S355J0	S355J0	S355J0				OL52.3K(f)	OL52.3K(f)	OL52.3K(f)
1.0562			St E355	P355N**	P355N**	P355N**	A633 Gr.C		A350-LF1			
1.0565	Wt E355			P355NH*	P355NH*	P355NH*						
						P355NH**						
						P355NL P355NL1						R510.7a R510.7b2
1.0566			TT StE36			P355NL1**						RV52
1.0570	St 52.3	St 52.3		S355J2G3*	S355J2G3*	S355J2G3*			A350 Gr.LF2	OL52.3Kf	OL52.3Kf	OL52.3Kf
1.0571				P355QH*	P355QH*	P355QH*						
1.0576				S355J2H	S355J2H	S355J2H				OL52.3k(f)	OL52.3k(f)	OL52.3k(f)
1.0577												R52
1.0577			A St 52			S355J2G4						OL52.4Kf
1.0578				EN10208-2 L360MB								

tabel C 1.1. (Continuare) table C 1.1. (Continued)

Germany (DIN; SEW)			E.U. (EN)			U.S.A. (ANSI; ASTM)			Romania (STAS)			
Werkstoff	Tevi Pipe	Fitinguri Fittings	Flanse Flanges	Tevi Pipe	Fitinguri Fittings	Flanse Flanges	Tevi Pipe	Fitinguri Fittings	Flanse Flanges	Tevi Pipe	Fiting. Fittings	Flanse Flanges
1.0580	St 52											
1.0581	St 52.4											
1.0582	St E360.7			EN10208-2 L360NB			API STD5LX/X52	WPY52II				
1.0595				S355K2G3	S355K2G3	S355K2G3						OL52.3Kf +K2
1.0596						S355K2G4						OL52.4Kf +K2
1.0601	C60		C60*									
1.0619						GP240GH***						
1.0621						GP240GR***						
1.0625						GP280GH***						
1.1101	TTSt35*	TTSt35*					A333 Gr.1*	A420-WPL1*				
1.1103	ESt E255	ESt E255										
1.1104	ESt E285	ESt E285										
1.1104						P275NL2**						
1.1106						P355NL2**						
1.1131						G17Mn5***						
1.1133						20Mn5*						
1.1170	28Mn6****			28Mn6*						20Mn10		
1.1180	Cm35											
1.1181	Ck35					C35E*				OLC35X		
1.1191	Ck45									OLC45X		
1.1201	Cm45											
1.1203	Ck55									OLC55X		
1.1209	Cm55											
1.1221	Ck60					C60E*				OLC60X		
1.1223	Cm60					C60E*				OLC60X		
1.4903				X10CrMo VNb9-1*	X10CrMo VNb9-1*	X10CrMo VNb9-1*						
1.4910	X3CrNi MoN 17 13					X3CrNiMo BN17-13-3 X3CrNiMo N17-13-3*						
1.4919	X6CrNi Mo 17 13											
1.4922	X20CrMo V12 1			X20CrMoV 11-1*	X20CrMoV 11-1*	X20CrMoV 11-1*	630 17-4PH					
1.4923												
1.4935	10CrMo9 10	10CrMo9 10					A355-P22	A355-P22		10CrMo10	10CrMo10	
1.5217	20MNV6			E450/ E470								
1.5402						15MnMo V4-5*						
1.5415	15Mo3	15Mo3	15Mo3	16Mo3	16Mo3	16Mo3*	A355-P1	A234-WP1		16Mo3	16Mo3	16Mo3
1.5419						G20Mo5***						T16Mo5***
1.5421						20MnMo3-5			A182 Gr.F1			
1.5422						G18Mo5***						
							A155-CM70	A234-WP1	A182-F1			
1.5423	16Mo5	16Mo5		16Mo5	16Mo5		A335-P1	A234-WP1	A182-F1			
							A369-FP1	A234 WP1	A182-F1			
1.5636						G9Ni10***						
1.5637	10Ni14	10Ni14		12Ni14	12Ni14	12Ni14	A333 Gr.3	A420-WPL3	A350-LF3	10Ni35	10Ni35	
1.5638						G9Ni14***						
1.5639				16Ni14	16Ni14	16Ni14	A333 Gr.3	A420-WPL3	A350-LF3			
1.5662	X8Ni9	X8Ni9					A333 Gr.8	A420-WPL8	A350-LF8			
							A333 Gr.9	A420-WPL9	A350-LF9			
1.6212	11MnNi5 3					11MnNi5 3						
1.6217	13MnNi6 3			13MnNi6 3*	13MnNi6 3*	13MnNi6 3*						
1.6220						G20Mn5***						
1.6228						15NiMn6						
1.6308						18MnMo Ni5-5*						
1.6311						20MnMo Ni4-5*						
1.6511	36CrNiMo4					20MnMo Ni4-5*						
1.6515			GS-2CrNi Mo4***									
1.6580	30CrNiMo8					30CrNiMo8*						

tabel C 1.1. (Incheiere) table C 1.1. (Concluded)

Werkstoff	Germany (DIN; SEW)			E.U. (EN)			U.S.A. (ANSI; ASTM)			Romania (STAS)		
	Tevi Pipe	Fitinguri Fittings	Flanse Flanges	Tevi Pipe	Fitinguri Fittings	Flanse Flanges	Tevi Pipe	Fitinguri Fittings	Flanse Flanges	Tevi Pipe	Fiting. Fittings	Flanse Flanges
1.6582	34CrNiMo6		GS-34 CrNiMo 6***			34CrNiMo6*						
1.6781						G17NiCrMo 13-6***						
1.7033						34Cr4*						
1.7034						37Cr4*						
1.7035	41Cr4					41Cr4*						
1.7218	25CrMo4		GS 25CrMo4***			25CrMo4*						
1.7219	26CrMo4											
1.7220	34CrMo4		GS 34CrMo4***			34CrMo4*						
1.7225	42CrMo4		GS 42CrMo4***			42CrMo4*						
1.7228						50CrMo4*						
							A155-1/2Cr	A234-WP2	A182-F2			
							A335-P2	A234-WP2	A182-F2			
							A369-FP2	A234-WP2	A182-F2			
							A155-1Cr	A234-WP12	A182-F12			
1.7335	13CrMo4 4	13CrMo4 4		13CrMo4-5	13CrMo4-5	13CrMo4-5	A335-P12	A234-WP12	A182-F12	14CrMo4 14MoCr10	14CrMo4 14MoCr10	
							A369-FP12	A234-WP12	A182-F12			
							A155-11/4Cr	A234-WP11	A182-F11			
							A335-P11	A234-WP11	A182-F11			
							A369-FP11	A234-WP11	A182-F11			
1.7337						16CrMo4-4			A182-F12			
1.7357						G17CrMo 5-5***						
							A155-5CR	A234-WP5	A182-F5			
1.7362	12CrMo19 5	12CrMo19 5		X11CrMo5	X11CrMo5		A335-P5	A234-WP5	A182-F5	16MoCr50	16MoCr50	
							A369-FP5	A234-WP5	A182-F5			
							A335-P7	A234-WP7	A182-F7			
							A369-FP7	A234-WP7	A182-F7			
1.7366				X16CrMo 5-1*	X16CrMo 5-1*	X16CrMo 5-1*						
							A155-21/4CR	A234-WP22	A182-F22			
1.7375				12CrMo9-10	12CrMo9-10	12CrMo9-10	A335-P22	A234-WP22	A182-F22			
							A369-FP22	A234-WP22	A182-F22			
1.7380	10CrMo9 10	10CrMo9 10	10CrMo9 10	10CrMo9-10	10CrMo9-10	10CrMo9-10	A335-P22	A234-WP22	A182-F22	10CrMo9 10 12MoCr22	10CrMo9 10 12MoCr22	10CrMo9 10 12MoCr22
1.7383				11CrMo9-10	11CrMo9-10	11CrMo9-10						
				11CrMo 9-10*	11CrMo 9-10*	11CrMo 9-10*						
1.7386				X12CrMo9-1	X12CrMo9-1	X12CrMo9-1	A335-P9	A234-WP9	A182-F9			
							A369-FP9	A234-WP9	A182-F9			
1.7707	30CrMoV9					30CrMoV9*						
1.7715	14MoV6 3					14MoV6-3*	A355P24	A234 Gr.WP24				
1.8821						P355ML						
1.8824						P420						
1.8826						P460M						
1.8828						P420ML2						
1.8831						P460ML2						
1.8832						P355ML1						
1.8833						P355ML2						
1.8835						P420ML1						
1.8837						P460ML1						
1.8902	StE420					S420N			A350 Gr.LF6			
1.8905	StE460					P460N			A350 Gr.LF6			
1.8912	T StE420									R55		
1.8913	EStE420									R55		
1.8915	TStE460											
1.8918	EStE460									R58		
1.8932	WStE420			P420NH*	P420NH*	P420NH*						
1.8935	WStE460					P460NH						
1.8936				P420QH*	P420QH*	P420QH*						

- * Oteluri forjate
Forged Steels
- ** Cu test de impact sub 0°C
With Impact Testing Below 0°C
- *** Oteluri turnate
Cast Carbon Steels
- **** Din oteluri aliate tratate prin calire si revenire
From Quenching and Tempering Alloy Steels

2. Oteluri-inox

2.0. Clasificare

Otelurile inox sunt oteluri cu cel puțin 10.5% conținut de Crom și maximum 1.2% Carbon (EN 10020). Există oteluri care conțin mai puțin de 10.5% Crom (oteluri rezistente la temperaturi înalte și la solicitări mecanice) dar se includ și în categoria otelurilor-inox.

După EN 10088-1, otelurile inox sunt clasificate în general după 3 caracteristici importante:

2.0.1. După utilizare

2.0.1.1. oteluri rezistente la coroziune

Sunt oteluri rezistente la acțiunea locală sau de suprafață a mediului în care lucrează, la presiunea atmosferică și temperatura mediului ambiant.

- grupa **1.40xx** cu < 2.5% Ni, fără Mo și fără adaosuri speciale;
- grupa **1.41xx** cu < 2.5% Ni, cu Mo și fără adaosuri speciale;
- grupa **1.43xx** cu ≥ 2.5% Ni, fără molibden și fără adaosuri speciale;
- grupa **1.44xx** cu ≥ 2.5% Ni, cu Mo și fără adaosuri speciale;
- grupa **1.45xx** și **146xx** cu adaosuri speciale ca Ti, Nb sau Cu.

2.0.1.2. oteluri rezistente la temperaturi înalte

Sunt oteluri de obicei feritice sau austenitice cu o bună rezistență la oxidare care lucrează la o temperatură mai mare de 550°C și care la acțiunea agentului oxidant formează o peliculă protectoare de crom, siliciu și aluminiu. După EN grupele sunt:

- grupa **1.47xx** cu < 2.5% Ni;
- grupa **1.48xx** cu ≥ 2.5% Ni.

2.0.1.3. oteluri rezistente la solicitări mecanice

Sunt oteluri de obicei austenitice sau martensitice cu o bună rezistență la deformări și solicitări mecanice de lungă durată, care lucrează la o temperatură în jur de 500°C. Grupa dată de EN pentru aceste oteluri este:

- grupa **1.49xx**.

2.0.2. După structura cristalină a materialului

2.0.2.1. Feritice

Ferita este asimilată cu **Fe-α** și este și o altă denumire a fierului. Aceasta deoarece fierul este principalul constituent. Structura cristalină este cubică cu atomi centralizați. Structura cubică a graunțului feritic da otelului proprietăți magnetice și este exemplul clasic de material feromagnetic.

Otelurile-inox feritice au în general proprietăți mecanice mai bune decât cele austenitice dar au o rezistență redusă la coroziune datorită conținutului mic de crom și nichel. De obicei sunt mai ieftine decât celelalte oteluri-inox.

Au o sudabilitate slabă datorită sensibilității lor la coroziune intergranulară și fragilizării în zonele încălzite.

Pentru îmbunătățirea proprietăților anticoroziive se aliază cu diferite elemente. Cele mai întâlnite compoziții includ molibden, aluminiu, titan sau plumb.

În standardele ASTM otelurile-inox feritice sunt clasificate în **seria 400**.

2.0.2.2. Martensitice

Otelurile-inox martensitice se obțin din otel-inox austenitic cu conținut mare de carbon încălzit la 900-1000°C care la răcire se cristalizează în structura martensitică stabilă.

Otelurile-inox martensitice conțin crom (12-14%), molibden (0.2-1%), nichel (mai puțin de 2%) și carbon (aproximativ 0,1-1% acest lucru oferindu-i duritate mare dar îl face și ceva mai fragil).

Aceste oteluri inox sunt caracterizate prin înaltă rezistență mecanică și rezistență la uzură mare dar sunt slab sudabile. Rezistența la coroziune este limitată și se degradează în zona de sudură unde conținutul de carbon crește.

Otelurile-inox martensitice sunt magnetizabile.

În standardele ASTM otelurile-inox martensitice sunt clasificate în **seria 400**.

2.0.2.3. Îmbunătățite de precipitație

Sunt oteluri obținute prin tratamente termice de recoacere și calire incluzând, în structura soluției topite martensitice de bază, elemente ce formează o structură de precipitație cu incluziuni de granulație mică care conferă o rezistență mecanică mai mare otelului. Elementele care se introduc în materialul de bază pentru formarea precipitației sunt metale: cupru, aluminiu, magneziu, titan și nitruri, carburi.

Otelurile inoxidabile martensitice imbunatatite prin precipitare au o rezistenta la coroziune comparabile cu cele austenitice, dar pot rezista la solicitari mai mari decât alte categorii martensitice.

Otelurile-inox martensitice de precipitare sunt magnetizabile.

2.0.2.4. Austenitice

Sunt otelurile-inox cu maximum 0.15% C, minimum 16% Cr, Ni si/sau Mn suficient pentru a pastra structura austenitica la punctul de topire al aliajului.

Otelurile-inox austenitice se caracterizeaza prin rezistenta la coroziune excelenta combinate cu sudabilitate, formabilitate si ductilitate foarte buna. Structura austenitica are rezistenta la fluaj si la oxidare bune care le face utile la temperaturi ridicate.

Otelurile supraustenitice ca aliajul AL-6XN si 254SMO (american) sau 1.4547 si 14652 cu continuturi mari de Cr, Mo, N, prezinta o mare rezistenta la coroziune si la actiunea coroziva a clorurilor datorita continutului ridicat de molibden (> 6%), si de azot. Nichelul in concentratie mai mare asigura o mai buna rezistenta la stres-coroziune cracare in comparatia cu seria 300.

Continutul ridicat de elemente de aliere face otelurile supraustenitice mai scumpe. Alte oteluri pot oferi performante similare la costuri mai mici si sunt de preferat in anumite aplicatii. Acestea sunt inoxuri cu continut scazut de carbon, de exemplu 316 sau 304L (1.4404 sau 1.4306), si sunt folosite pentru a evita problemele de coroziune cauzate de sudura.

In standardele ASTM inoxurile austenitice cu continut $\leq 2\%$ Mn sunt clasificate in **seria 300** iar inoxurile austenitice, cu continut $> 2\%$ Mn sunt clasificate in **seria 200**.

Otelurile-inox austenitice nu sunt magnetizabile.

2.0.2.5. Duplex (austenitic-feritice)

Sunt oteluri-inox care au o microstructura mixta austenitica si feritica. Proportia de aliere austenitic/feritic este de 70/30 pana la 50/50. Aceste oteluri imprumuta din calitatile otelurilor austenitice cat si din cele ale otelurilor feritice. Astfel proprietatile mecanice sunt superioare majoritatii otelurilor austenitice ele avand proprietati superioare la deformarea la rece. Otelurile-inox duplex au rezistenta la solicitari mecanice de doua ori mai mare in comparatie cu otelurile inoxidabile austenitice si rezistenta imbunatatita la coroziunea in fisuri si in medii puternic corozive.

Continutul de crom si molibden sunt mari: crom intre 19-28% si molibden (pâna la 5%) iar continutul de nichel mai mic decât la otelul-inox austenitic.

Aceste oteluri sunt mai ieftine decat inoxurile austenitice la proprietati mecanice superioare.

Cel mai obisnuit duplex este cel standard unde cromul este in jur de 22%.

O grupa speciala in cadrul otelurilor-inox duplex sunt cele "superduplex" care au un continut de peste 24-25% crom si continut superior de molibden si azot.

Otelurile-inox duplex si superduplex sunt magnetizabile.

In standardele ASTM otelurile-inox duplex austenitic-feritice sunt clasificate in **seria 300**.

2.0.3. Dupa elementele de aliere (EN100800-1)

2.0.3.1. Crom si Nichel

Denumite dupa principalele elemente de aliere. Uzual inoxul este denumit „crom-inox” pentru inoxurile feritice si „inox crom-nichel” pentru inoxurile austenitice.

2.0.3.2. Molibden

Otelurile austenitice cu continut mai mare de 2% Mo se numesc „inox CrNiMo” sau „inox rezistent la acid” deoarece molibdenul din compozitie le maresta rezistenta la coroziune si in special la cloruri.

2.0.3.3. Mangan

Manganul este adaugat la otelurile austenitice in proportie $\leq 2\%$ ca un substitut al nichelului, pentru a creste solubilitatea azotului.

Pentru Mn $> 2\%$ este o alta clasă.

In standardele ASTM inoxurile austenitice, cu mai mult de 2% mangan sunt clasificate in seria 200 iar in CR ISO 15608 se clasifica ca o grupa separata de inox austenitic, grupa 8.3, cu (2-9%).Mn.

2.0.3.4. Concentratie scazuta de Carbon

Pentru a se evita coroziunea se fac oteluri cu $\leq 0.0030\%$ carbon, asa-numitele inoxuri - LC (carbon scazut), caz în care tot carbon ramane în solutia solida si nu se mai combina cu crom pentru a forma precipitate de cabura de crom.

2.0.3.5. Azot

Este un element care stabilizeaza austenita adaugat ca un inlocuitor al nichelului.

2.0.3.5. Stabilizate

Alierea cu titan, niobiu si zirconiu previne formarea precipitatului crom-carbon. Aceste calitati de oteluri sunt mult mai stabile si au rezistenta mecanica mult mai buna pana in jur de 600°C.

2. Stainless Steels

2.0. Classification

Stainless steels are steels with at least 10.5% of Chromium and maximum 1.2% of Carbon (EN 10020)

There are stainless steels exceptions to the rule, which contain less Chromium than 10.5% (the heat-resisting and creep-resisting steels respectively) but are included and in the stainless steels family.

According to EN 10088-1 Stainless steels are generally classified by three major principles:

2.0.1. Use properties

2.0.1.1. Corrosion resisting

Are steels resistant to the action of the local environment or the working surface at atmospheric pressure and ambient temperature.

- **1.40xx** for grades with <2.5% Ni, Mo-free and without special additions;
- **1.41xx** for grades with <2.5% Ni, Mo and without special additions;
- **1.43xx** for grades with $\geq 2.5\%$ Ni, without special supplements and without molybdenum;
- **1.44xx** for grades with $\geq 2.5\%$ Ni, Mo and without special additives;
- **1.45xx** and **146xx** for grades with special additions, such as Ti, Nb or Cu.

2.0.1.2. Heat resisting

Heat resisting steels are usually ferritic or austenitic steels, with good resistance to oxidation when working at a temperature higher than 550 °C. In oxidizing environment forms a protective film of chromium, silicon and aluminum. Over EN grades are:

- **1.47xx** for grades with <2.5% Ni;
- **1.48xx** for grades with $\geq 2.5\%$ Ni.

2.0.1.3. Creep resisting

Creep resisting steels are usually martensitic or austenitic stainless-steels with good mechanical resistance to deformation and long-time stressing who works at a temperature about 500°C. Over EN these steels are:

- **1.49xx** grades.

2.0.2. Over microstructure

2.0.2.1. Ferritic

Ferrite is similar to Fe- α and is also another name for iron. This is because iron is the main constituent in a solid solution, with a body centred cubic crystal structure. It is the component which gives steel and cast iron their magnetic properties, and is the classic example of a ferromagnetic material.

Ferritic stainless steels, generally have better mechanical properties than austenitic grades, but have reduced corrosion resistance, due to the lower chromium and nickel content. They are also usually less expensive.

They have a poor weldability due to their sensitivity to intergranular corrosion and embrittlement in heated areas.

To increase corrosion properties is usually combined with molybdenum, aluminium, titanium or lead.

*The ASTM standards are classified ferritic stainless steels in the **400 series**.*

2.0.2.2. Martensitic

Martensitic stainless steels, are obtained from austenitic stainless steel with high carbon content heated at 900-1000°C, which on cooling crystallizes in stable martensitic structure.

Martensitic stainless steels containing chromium (12-14%), molybdenum (0.2-1%), nickel (less than 2%) and carbon (about 0.1-1% and giving it more hardness but making the material a bit more brittle).

These stainless steels are characterized by high strength and high wear resistance but is pore weldable. Corrosion resistance is limited and degrades in the welding area where the carbon content increases.

Martensitic stainless steels are magnetizable.

*The ASTM standards classified martensitic stainless steels in the **400 series**.*

2.0.2.3. Precipitation hardening

Steels are obtained by annealing and quenching heat treatment when included, in the martensitic structure of the molten solution, elements that form a structure with inclusions grained precipitate which gives a higher strength steel. Elements that are inserted into the base material to form precipitate are metals like copper, aluminum, magnesium, titanium and nitrides, carbides. Martensitic stainless steels improved by precipitation have corrosion resistance comparable to austenitic, but have increased strength than other martensitic grades.

Precipitation hardening martensitic stainless steels are magnetizable.

2.0.2.4. Austenitic

The austenitic stainless steels contain a maximum of 0.15% carbon, a minimum of 16% chromium and sufficient nickel and/or manganese to retain an austenitic structure at all temperatures from the cryogenic region to the melting point of the alloy.

Austenitic stainless steels is characterized by excellent corrosion resistance combined with good weldability formability and ductility. Austenitic structure has good creep and oxidation resistant and it is useful at high temperatures.

Superaustenitic steels like the alloy AL-6XN and 254SMO (American) or 1.4547 and 14.652 with high contents of Cr, Mo, N, exhibit great resistance to chloride pitting and crevice corrosion due to high molybdenum content (> 6%) and nitrogen additions and the higher nickel content ensures better resistance to stress-corrosion cracking versus the 300 series.

The higher alloy content of superaustenitic steels makes them more expensive. Other steels can offer similar performance at lower cost and are preferred in certain applications. Low-carbon versions, for example 316L or 304L (1.4404 or 1.4306), are used to avoid corrosion problems caused by welding.

In the ASTM standards, the austenitic stainless steels with contents $\leq 2\%$ Mn are classified in the 300 series and the austenitic grades with $> 2\%$ Mn are classified as 200 series.

Austenitic stainless steels, are not magnetizable.

2.0.2.5. Duplex (austenitic-ferritic)

Duplex stainless steels have a mixed microstructure of austenite and ferrite.

The mixture proportion austenitic / ferritic is 70/30 to 50/50. These steels borrow the qualities of the austenitic steels and of ferritic steels. Strength properties are higher than at most other austenitic steels hence high power is required for cold deformation. Duplex steels have twice the strength compared to austenitic stainless steels and also improved resistance to localized corrosion, particularly pitting, crevice corrosion and stress corrosion cracking. They are characterized by high chromium (19–28%) and molybdenum (up to 5%) and lower nickel contents than austenitic stainless steels.

These steels are cheaper than austenitic at higher strength properties.

The standard typical duplex have about 22% Cr.

A separate duplex steel group is “**superduplex**”, typical with chromium over 24-25%, high molybdenum and nitrogen contents.

Duplex and superduplex stainless steels are magnetizable.

In the ASTM standards, duplex (austenitic-ferritic) stainless steels are classified in the **300 series**.

2.0.3. Over alloying elements (EN100800-1)

2.0.3.1. Chromium and Nickel

Denominated over the principals alloying elements. Usually stainless steels are defined “Cr-steel” for ferritic grades and “CrNi-steel” for austenitic grades.

2.0.3.2. Molybdenum

Austenitic grades with over 2% Mo called “CrNiMo-steel” or “acid resisting-steel” because Molybdenum improve their corrosion resistance especial against chloride induced pitting.

2.0.3.3. Manganese

Manganese is added in the austenitic steels in $\leq 2\%$ as a substitute for nickel to increase the solubility of nitrogen.

For Mn $> 2\%$ is classified in another class.

In the ASTM standards the austenitic grades with more than 2% manganese are classified as 200 grades and in CR ISO 15608 is classified a separate austenitic steel group 8.3, with (2-9%).Mn.

2.0.3.4. Low Carbon

To avoid intergranular corrosion we can make steels with $\leq 0.0030\%$ carbon, so called “LC-steels” (Low Carbon) in which case, all the carbon remains in the solid solution and does not combine with chromium to form chromium-carbide precipitates.

2.0.3.5. Nitrogen

Is a strong stabilizing element for austenite, added as a substitute of nickel.

2.0.3.5. Stabilization

Addition of titanium, niobium or zirconium prevents the precipitation of chrome- carbide. These grades are more stable and has good strength properties up about 600°C.

2.1. Proprietati fizice ale otelurilor-inox Stainless Steels Physical Properties

2.1.1. Rezistenta la oxidare High Oxidation-resistance

Otelurile-inox prezinta o inalta rezistenta la oxidare in aer la temperatura ambianta in cazul alierii cu minim 13% crom si pana la 26% crom pentru medii dure. Modul in care cromul protejeaza suprafata, atunci cand este expusa la oxigen, este prin formarea unui strat de trioxid de crom Cr_2O_3 , strat prea subtire ca sa fie vizibil iar suprafata ramane lucioasa si impermeabila la actiunea apei si a aerului. Acest strat protector se reface rapid cand suprafata este zgariata. Fenomenul este numit pasivizare si este intalnit si la alte metale cum ar fi aluminiu sau titan. Rezistenta la coroziune poate fi afectata in mod negativ in cazul in care piesa este utilizata intr-un mediu neoxigenat, fiind impiedicata formarea oxidului protector. Din acest motiv se evita folosirea imbinarilor demontabile din acelasi tip de inox care sunt stranse impreuna (de exemplu suruburi cu piulite) deoarece poate aparea sudura de contact si ele se pot rupe la demontare. Pentru astfel de imbinari se folosesc inoxuri diferite martensitic cu austenitic sau inox si bronz, etc. Introducerea azotului in aliaj reduce deasemenea sudura de contact.

Stainless Steels have a high oxidation-resistance in air at ambient temperature is normally achieved with additions of a minimum of 13% (by weight) chromium, and up to 26% is used for harsh environments. The chromium forms a passivation layer of chromium(III) oxide (Cr_2O_3) when exposed to oxygen. The layer is too thin to be visible, and the metal remains lustrous. The layer is impervious to water and air, protecting the metal beneath. Also, this layer quickly reforms when the surface is scratched. This phenomenon is called passivation and is seen in other metals, such as aluminium and titanium. Corrosion-resistance can be adversely affected if the component is used in a non-oxygenated environment.

When stainless steel parts such as nuts and bolts are forced together, the oxide layer can be scraped off, causing the parts to weld together. When disassembled, the welded material may be torn and pitted, an effect known as galling. This destructive galling can be best avoided by the use of dissimilar materials for the parts forced together, for example bronze and stainless steel, or even different types of stainless steels (martensitic against austenitic), when metal-to-metal wear is a concern. Nitronic alloys reduce the tendency to gal.

2.1.2. Densitatea si magnetismul otelurilor inox (dupa EN10088-1) Density and Magnetism of Stainless Steels (according EN10088-1)

tabel C 2.1.2. table C 2.1.2.

DENSITATEA SI MAGNETISMUL OTELURILOR INOX PE GRUPE DENSITY AND MAGNETISM OF STAINLESS STEELS FOR GROUPS		ρ kg/dm ³	magne- tizabil	magne- tizabile
fertic rezistent la coroziune <i>ferritic corrosion resisting</i>	1.4000, 1.4002, 1.4003, 1.4016, 1.4017, 1.4105, 1.4113, 1.4509, 1.4510, 1.4511, 1.4512, 1.4513, 1.4516, 1.4520, 1.4521, 1.4523, 1.4526, 1.4589, 1.4590, 1.4592, 1.4595	7.7	da	yes
martensitic si imbunatatit prin precipitare <i>martensitic and precipitation hardening</i>	1.4005, 1.4006, 1.4021, 1.4024, 1.4028, 1.4029, 1.4031, 1.4034, 1.4035, 1.4057, 1.4104, 1.4109, 1.4110, 1.4112, 1.4116, 1.4122, 1.4123, 1.4125, 1.4313, 1.4418, 1.4419, 1.4422, 1.4423, 1.4530, 1.4596	7.7	da	yes
	1.4415, 1.4542, 1.4568, 1.4594	7.8	da	yes
	1.4606	7.9	nu	no
austenitic rezistent la coroziune <i>austenitic corrosion resisting</i>	1.4361	7.7	nu	no
	1.4371, 1.4372, 1.4373, 1.4374, 1.4597	7.8		
	1.4301, 1.4303, 1.4305, 1.4306, 1.4307, 1.4310, 1.4311, 1.4315, 1.4318, 1.4319, 1.4325, 1.4335, 1.4369, 1.4541, 1.4550, 1.4567, 1.4570, 1.4580	7.9		
	1.4401, 1.4404, 1.4406, 1.4429, 1.4432, 1.4434, 1.4435, 1.4436, 1.4438, 1.4439, 1.4449, 1.4466, 1.4539, 1.4547, 1.4559, 1.4563, 1.4565, 1.4571, 1.4578, 1.4580, 1.4598, 1.4652	8.0		
	1.4529, 1.4537	8.1		
	1.4659	8.2		
austenitic-fertic (duplex) rezistent la coroziune <i>austenitic-ferritic (duplex) corrosion resisting</i>	1.4477	7.7	da	yes
	1.4362, 1.4410, 1.4424, 1.4460, 1.4462, 1.4501, 1.4507, 1.4655	7.8		
fertic temperaturi inalte <i>ferritic heat-resisting</i>	1.4713, 1.4724, 1.4736, 1.4742, 1.4749, 1.4762	7.7	da	yes
austenitic temp. inalte <i>austenitic heat-resisting</i>	1.4818, 1.4835, 1.4872	7.8	nu	no
	1.4828, 1.4833, 1.4841, 1.4845, 1.4854, 1.4878	7.9		
	1.4864, 1.4876, 1.4877, 1.4886, 1.4887	8.0		
austenitic-fertic temp. inalte <i>austenitic-ferritic heat-resisting</i>	1.4821	7.7	da	yes
martensitic fluaj <i>martensitic creep resisting</i>	1.4903, 1.4913, 1.4922, 1.4923, 1.4935	7.7	da	yes
	1.4905, 1.4911, 1.4938	7.8		
austenitic fluaj <i>austenitic creep resisting</i>	1.4912, 1.4940, 1.4941, 1.4948, 1.4950, 1.4951, 1.4961, 1.4986,	7.9		
	1.4910, 1.4918, 1.4919, 1.4945, 1.4958, 1.4959, 1.4962, 1.4980, 1.4981, 1.4982, 1.4983, 1.4988	8.0		
	1.4971	8.3		

2.2. Oteluri-inox comparabile in diferite standarde Comparative Stainless Steels in Different Standards

XXXXXX FERRITIC
 XXXXXX MARTENSITIC SI DE PRECIPITARE
 XXXXXX AUSTENITIC CROM-NICHEL
 XXXXXX AUSTENITIC-FERRITIC (DUPLEX)
 XXXXXX AUSTENITIC CROM-NICHEL MOLIBDEN
 XXXXXX AUSTENITIC

FERRITIC
 MARTENSITIC AND PRECIPITATION HARDENING
 AUSTENITIC CHROMIUM-NICKEL
 AUSTENITIC-FERRITIC (DUPLEX)
 AUSTENITIC CHROMIUM-NICKEL MOLYBDENUM
 AUSTENITIC

tabel C 2.2. table C 2.2.

Germany		E.U.	U.S.A.	France	Italy	Sweden	U.K.	Spain	Japan	Russia	China	Romania
Werkstoff	DIN	EN	AISI	AFNOR	UNI	SIS	BSI	UNE	JIS	GOST	GB	STAS
1.4016	X6Cr17	X6Cr17*	430	Z8C17		2320	430S17	X8Cr17	SUS430	12Ch17	1Cr17	8Cr170
1.4104		X14CrMoS17	430F	Z13CF17		2383						
1.4105	X6CrMoS18	X6CrMoS17	430F	Z8CF17								
1.4112		X90CrMoV18	440B									
1.4113	X6CrMo17-1	X6CrMo17-1	434	Z8CD17.01								
1.4122		X39 CrMo17-1		Z38CD16.01								
1.4125	X105CrMo17		440C	Z100CD 17								
1.4509		X2CrTiNb18	441	Z3CTNb18								
1.4510	X3CrTi17	X3CrTi17	430Ti 439	Z4CT17				X3CrTi17	SUS430LX	08Ch17T	00Cr17	8TiCr170
1.4512	X2CrTi12	X2CrTi12	409	Z3CT 12			409S19		SUH409L			
1.4521	X2CrMoTi 18-2	X2CrMoTi 18-2	444	Z3CDT18-02								
1.4000	X6Cr13	X6Cr13	410S	Z6C13		2301	403S17		SUS410S	08Ch13		
	X6Cr13	X10Cr13	403 410	Z12C13	X12CR13	2302	403S17	X6Cr13	SUS403	12Ch13		10Cr130
			414									
1.4002	X6CrAl13	X6CrAl13	405	Z6CA13	X6CrAl13		405S17	X6CrAl13	SUS405			7AlCr130
1.4005	X12CrS13	X12CrS13	416	Z11CF13	X12CrS13		416S21		SUS416			
1.4006	X12Cr13	X10Cr13	410 403	Z10C13	X12Cr13	2302	403S17 410S21	X6Cr13	SUS403 SUS410	12Ch13		10Cr130
1.4021	X20Cr13	X20Cr13	420	Z20C13		2303	420S29	X20Cr13	SUS420J1	20Ch13	2Cr13	20Cr120
1.4024	X15Cr13	X12Cr13	403 410	Z10C13	X12Cr13	2302	403S17 410S21	X6Cr13	SUS403 SUS410	12Ch13		30Cr130
1.4028	X30Cr13	X30Cr13	420	Z33C13		2304	420S45	X30Cr13	SUS420J2	30Ch13	3Cr13	
1.4029		X29CrS13	420F	Z29CF13								
1.4031		X39Cr13										40Cr130
1.4034	X40Cr13	X46Cr13	420C	Z40 C13			420S45					40Cr130
1.4057	X20CrNi17-2	X17CrNi16.2	431	Z15CN16.2	X16CrNi16	2321	431S29		SUS431			
1.4542 precip.		X5CrNiCuNb 16-4	630	Z17CNU 17.04					SUS630			
1.4713	X10CrAl 7	X10CrAl 7		Z8CA7								
1.4724	X10CrAl 13				X10CrAl 12					10Ch13SYu		
1.4742	X10CrAl 18	X10CrSiAl 18								15Ch18SYu		
1.4931		GX23CrMo V12-1										
1.4301	X5CrNi18-10	X5CrNi18-10	304	Z7CN18.09	X5CrNi1810	2333	304S31	X6CrNi19-10	SUS304	08Ch18N10	0Cr18Ni9	5NiCr180
			304H		X8CrNi1910			X6CrNi19-10	SUS F304H			
1.4303	X5CrNi18-12	X6CrNi18-10	305	Z1CN18.12	X5CrNi1810	2332	305S19	X6CrNi19-10	SUS305J1	06Ch18N11	1Cr18Ni12	
1.4305	X10CrNiS 18-9	X8CrNi18-9	303 8F B8F	Z8CNF18.09	X10CrNiS 1809	2346	303S31	X10CrNiS 18-09	SUS303	12Ch18N10E	Y1Cr18Ni9	
1.4306	X2CrNi19-11	X2CrNi19-11	304L	Z3CN18.10	X2CrNi1911	2352	304S11	X2CrNi19-10	SUS304L	03Ch18N11	00Cr19Ni10	2NiCr185
1.4307	(X2CrNi 18-9)	X2CrNi18-9	304L	Z3CN18.10		2352	304S11		SUS304L	03Ch18N11	00Cr19Ni10	
1.4308**		GX5Cr Ni19-10	CF8						SCS13A			
1.4310	X12CrNi17-7	X10CrNi18-8	301	Z12CN17.07 Z11CN18.08	X12CrNi 1707	2331	301S21	X12Cr Ni17-07	SUS301	07Ch16N6	1Cr17Ni7	
1.4311	X2CrNiN 18-10	X2CrNiN18-10	304LN	Z2CN18.10Az Z3CN18.10Az	X2CrNiN 1811	2371	304S61		SUS304LN		00Cr18 Ni10N	
1.4318		X2CrNiN18-7	301Ln	Z3CN18.07Az					SUS301L			
1.4319	X5CrNi18-7	X10CrNi18-9	302	Z10CN18.09	X10CrNi 1809	2331	302S25	X10CrNi 18-09	SUS302	12Ch18N9		
1.4371	X12CrMnNi 18-85	X2CrMn NiN17-7-5	201	Z12CMN 17.07Az					SUS201			
1.4372			201	Z12CMN 17.07Az					SUS201		1Cr17Mn 6Ni5N	

tabel C 2.2. (Continuare) table C 2.2. (Continued)

Germany		E.U.	U.S.A.	France	Italy	Swe- den	U.K.	Spain	Japan	Russia	China	Romania
Werk- stoff	DIN	EN	AISI	AFNOR	UNI	SIS	BSI	UNE	JIS	GOST	GB	STAS
			202				284S16		SUS202			
1.4541	X6CrNiTi 18-10	X6CrNiTi 18-10	321	Z6CNT18.10	X6CrNiTi 1811	2337	321S31	X6CrNiTi 18-11	SUS321	08Ch18N10T	0Cr18Ni10Ti	10TiNiCr180
			321H		X8CrNiTi 1811		321S20	X7CrNiTi 18-11	SUS321H	12Ch18N10T		
1.4550	X6CrNiNb 18-10	X6CrNiNb 18-10	347	Z6CNNb 18.10	X6CrNiNb 1811	2338	347S31	X6CrNiNb 18-11	SUS347	08Ch18N12B		
			347H		X8CrNiNb 1811			X7 CrNiNb 18-11	SUS F347H			
1.4567			S30430	Z3CNU 18.09FF					SUSXM7		0Cr18Ni9 Cu3	
			304N		X5CrNiN 1810				SUS304N1			
		X6CrNiCu 18 10 4Kd		Z6CNU18.10					SUS XM7			
1.4570	X6CrNiCu S18-9-2			Z8CNUF 18.09								
			303Se	Z10CNF 18.09	X10CrNiS 1809		303S41	X10CrNiS 18-09	SUS303Se	12Ch18N10E		
1.4162			S32101									
1.4313		X3CrNiMo 13-4		Z4CND 13.04M			425C12					
1.4362		X2CrNiN 23-4	S32304	Z3CN 23.04Az		2327						
1.4410		X2CrNiMoN 25-7-4	S32750 F53Cr25	Z3CND 25.06Az		2328						
1.4418		X4CrNiMo 16.5.1		Z6CND 16.05.01		2387						
1.4462	X2CrNiMo N22-5	X2CrNiMoN 22-5-3	S32205 S31803 F51Cr22	Z3CND 22.05Az		2377	318S13		SUS329J3L		00Cr22Ni5 Mo3N	
1.4501	X3CrNiMo N25-7	X2CrNiMoCuWN25-7-4	S32760 F55	Z3CND 25-06Az								
1.4529		X1NiCrMoCuN25-20-7										
1.4401	X5CrNiMo 17-12(13)-2	X5CrNiMo 17-12-2	316 8M B8M	Z7CND 17.11.2	X5CrNiMo 1712	2347	316S31	X6CrNiMo 17-12-03	SUS316		0Cr17Ni 12Mo2	
1.4404	X2CrNiMo 17-12-2	X3CrNiMo 17-12-2	316L 8M B8M	Z7CND 17.12.02	X2CrNiMo 1712	2348	316S11	X2CrNiMo 17-12-03	SUS316L	03Ch17N14M2	00Cr17Ni 14Mo2	
1.4406	X2CrNiMoN 17-12-2		316LN	Z2CND 17.12AZ	X2CrNiMoN 1712		316S61		SUS316LN		00Cr17Ni 12Mo2N	
1.4408**	GX5CrNi Mo19-11-2											
1.4429	X2CrNiMoN 17-13-3	X2CrNiMoN 17-13-3	TP316 LN	Z2CND 17.13AZ	X2CrNiMoN 1713	2375	316S63		SUS316LN		00Cr17Ni 13Mo2N	
1.4432	X2CrNiMo 17-12-2	X2CrNiMo 17-12-3	316L	Z3CND 17.13.03		2353	316S13		SUS316L	03Ch17N14M3	00Cr17Ni 14Mo2	
1.4434		X2CrNiMoN 18-12-4	317LN	Z3CND 19.14.AZ		2373						
1.4435	X2CrNiMo 18-14-3	X3CrNiMo 17-13-3	316L F1 38g2	Z3CND 18.14.03	X2CrNiMo 1713	2353	316S13 2354 4341/B	X2CrNiMo 17-12-2	SUS316L	03Ch16N15M3 03Ch17N14M3	00Cr17Ni 14Mo2	2MoNiCr175
			317		X5CrNiMo 1815	2366	317S16		SUS317			
1.4436	X5CrNiMo 17-12-3	X3CrNiMo 17-13-3	316	Z7CND 18.12.03	X5CrNiMo 1713	2343	316S33	X6CrNiMo 17-12-03	SUS316		0Cr17Ni 12Mo2	
1.4438	X2CrNiMo 17-16-4 X2CrNiMo 18-16-4	X2CrNiMo 18-15-4 X3CrNiMo 18-16-4	317L	Z2CND 19.15 Z3CND 19.15.04	X2CrNiMo 1815	2367	317S12		SUS317L		00Cr19Ni 13Mo3	
1.4439	X2CrNiMoN 17-13-5		317LMN	Z3CND 18.14.05Az								
1.4460	X8CrNiMo 27-5	X3CrNiMoN 27-5-2	329	Z3CND 25.07Az		2324			SUS329J1			
1.4539		X1NiCrMoCu 25-20-5	904L	Z2NCDDU 25.20		2562	904S13					
1.4547		X1CrNiMoCu N20-18-7	S31254 F44			2378						
1.4565			S34565									
1.4571	X6CrNiMo Ti17-12-2	X6CrNiMoTi 17-12-2	316Ti	Z6CNDT 17.12	X6CrNiMoTi 1712	2350	320S31	X6CrNiMo Ti17-12-03	SUS316Ti	08Ch17N13 M2T	0Cr18Ni 12Mo2Ti	10TiMoNi Cr175
1.4573	X10CrNiMo Ti18-12	X6CrNiMoTi 17-13-3			X6CrNiMoTi 1713		320S33	X6CrNiMo Ti17-12-3		10Ch17N13 M2T		
1.4580	X6CrNiMo Nb17-12-2	X6CrNiMoNb 17-12-2		Z6CNDNb 17.12	X6CrNiMoNb 1712					08Ch16N13 M2B		
1.4583	X10CrNiMo Nb18-12	X6CrNiMoNb 17-13-3			X6CrNiMoNb 1713					09Ch16N15 M3B		
1.4598		X2CrNiMoCu S17-10-2							SUS316F			
1.4818			S30415			2372						
1.4821	X20CrNiSi 25-4	X15CrNiSi 25-4										
1.4828	X15CrNiSi 20-12	X15CrNi 23-13	309	Z15CN 24.13 Z17CNS20.12	X16CrNi2314		309S24		SUH309	08Ch20N14C2	1Cr20Ni 14Si2	15SiNiCr200

tabel C 2.2. (Incheiere) table C 2.2. (Concluded)

Germany		E.U.	U.S.A.	France	Italy	Swe- den	U.K.	Spain	Japan	Russia	China	Romania
Werk- stoff	DIN	EN	AISI	AFNOR	UNI	SIS	BSI	UNE	JIS	GOST	GB	STAS
1.4833		X6CrNi22-13	309S	Z15CN24.13	X6CrNi2314		309S16		SUS309	20Ch23N13	0Cr23Ni13	
1.4835		X9CrNiSi NCe21-11-1	S30815			2368						
1.4841	X15CrNiSi 25-20	X15CrNiSi 25-21	314	Z12CNS25.20	X16CrNiSi 2520					20Ch25N20S2		15SiNiCr250
1.4845	X12CrNi 25-21		310	Z8CN25.20	X22CrNi2520	2361	310S24		SUH310	20Ch23N18		
		X8CrNi25-21	310S				310S16	SUS310S	10Ch23N18	0Cr25Ni20	12SiNiCr250	
1.4854			S35315									
1.4864	X12NiCrSi 35-16	X12NiCrSi 36-16	330	Z12NCS35.16					SUH330			
1.4878	X8CrNiTi 18-10	X12CrNiTi 18-9	321(H)	Z6CNT18.10		2337	321S51		SUS321	08Ch18N10T	1Cr18Ni9Ti	12TiNiCr180
1.4910		X3CrNiMo BN17-13-3										
		X3CrNiMo N17-13-3*										
1.4912		X7CrNi Nb18-10*										
1.4941	X8CrNi Ti18 10	X6CrNiTi B18-10 X6CrNiTi B18-10*										
1.4948	X6Cr Ni18 11	X6CrNi18-11 X6CrNi18-10*	304H	Z6CN18.09		2333	304S51		SUS304	08Ch18N10	1Cr18Ni9	

- * Oteluri inox forjate
Forged Stainless Steels
** Oteluri inox turnate
Cast Stainless Steels

2.3. Compozitia chimica si proprietati mecanice ale otelurilor- inox Stainless Steels Chemical Composition and Mechanical Properties

XXXXXX FERRITIC

XXXXXX MARTENSITIC

XXXXXX AUSTENITIC CROM-NICHEL

XXXXXX AUSTENITIC FERRITIC (DUPLEX)

XXXXXX AUSTENITIC CROM-NICHEL MOLIBDEN

XXXXXX AUSTENITIC

FERRITIC

MARTENSITIC

AUSTENITIC CHROMIUM-NICKEL

AUSTENITIC FERRITIC (DUPLEX)

AUSTENITICUES CHROMIUM-NICKEL MOLYBDENUM

AUSTENITIC

tabel C 2.3. table C 2.3.

Germany		USA	Compozitia chimica Chemical Composition									Valori maxime % Maximum Values %			Proprietati mecanice Mechanical Properties			
Werkstoff	DIN (EN)	AISI	C	Mn	Si	P	S	Cr	Ni	Mo	Others	t mm	Limita de elasticitate	Rezistenta la rupere	Alung. Elong.			
													Yield Strength	Tensile Strength				
													N/mm ² (min)	N/mm ² (min)		min%		
1.4016	X6Cr17	430	0.08	1.00	1.00	0.040	0.015	16.00-18.00	-	-	Al 0.1-0.3		270	450-600	20L; 18T			
1.4104	(X14CrMoS17)	430F	0.12	1.25	1.00	0.060	0.15 min	16.00-18.00	-	-	-	mechanical properties of bars shall be agreed upon between the parties concerned with delivery						
1.4105	X6CrMoS18	430F	0.08	1.50	1.50	0.040	0.15-0.35	16.00-18.00	-	-	-	≤100	250	430-630	-			
1.4113	X6CrMo17-1	434	0.08	1.00	1.00	0.040	0.015-0.030	16.00-18.00	-	0.90-1.40	-	≤12 ≤100	260 280	450-630 440-660	-			
1.4125	X105CrMo17	440C	0.95-1.20	1.00	1.00	0.040	0.030	16.00-18.00	-	0.40-0.80	-	mechanical properties of bars shall be agreed upon between the parties concerned with delivery						
1.4509	(X2CrTiNb18)	441	0.030	1.00	1.00	0.040	0.015	17.50-18.50	-	-	Ti 0.10-0.60; Nb [3 x C+0.30] to 1	≤2.5	230 L; 250 T	430-630	18			
1.4510	X3CrTi17	430Ti439	0.05	1.00	1.00	0.040	0.015	16.00-18.00	-	-	Ti [4 x (C+N)+0.15] to 0.80	≤3	230 L; 240 T	420-600	23			
1.4512	X2CrTi12	409	0.030	1.00	1.00	0.040	0.015	10.50-12.50	-	-	Ti6x(C+N) to 0.65	≤6	190 210	390-560 380-560	20L; 18T 25			
1.4521	X2CrMoTi18-2 (X2CrTi12)	444	0.025	1.00	1.00	0.040	0.015	17.00-20.00	-	1.80-2.50	Ti [4x(C+N)+0.15] to 0.80; N 0.03	≤2.5	300 L; 320 T	420-640	20			
1.4000	X6Cr13	410S	0.08	1.00	1.00	0.040	0.03	12.00-14.00	-	-	-	≤25	230	400-630	19			
	X6Cr13 (X10Cr13)	403 410	0.08	1.00	1.00	0.040	0.015	12.00-14.00	-	-	-	≤6 ≤25	240 220	400-600	20			
		414																
1.4002	X6CrAl13	405	0.08	1.00	1.00	0.040	0.015	12.00-14.00	-	-	Al 0.10-0.30	-	250	400-600	20L; 15T			
1.4005	X12CrS13	416	0.08-0.15	1.50	1.0	0.040	0.15-0.35	12.00-14.00	-	0.60	-	≤160	450	650-850	12			
1.4006	X12Cr13 (X10Cr13)	410 403	0.08-0.15	1.50	1.00	0.040	0.015	11.50-13.50	0.75	-	-		250	450-650	20L; 15T			
1.4021	X20Cr13	420	0.16-0.25	1.50	1.00	0.040	0.015	12.00-14.00	-	-	-	≤75	480 550	650-850 750-950	12 10			
1.4024	X15Cr13 (X12Cr13)	403 410	0.08-0.15	1.50	1.00	0.040	0.015	11.50-13.50	0.75	-	-		250	450-650	20L; 15T			
1.4028	X30Cr13	420	0.26-0.35	1.50	1.00	0.040	0.015	12.0-14.0	-	-	-	≤75	600	800-1000	10			
1.4029	(X29CrS13)	420F	0.25-0.32	1.50	1.00	0.040	0.15-0.25	12.00-13.50	-	0.60	-	≤160	650	850-1000	9			
1.4031	(X39Cr13)																	
1.4034	X40Cr13	420C	0.28-0.36	1.00	1.00	0.040	0.030	12.0-14.0	1.00									
1.4057	X20CrNi17-2	431	0.12-0.22	1.50	1.00	0.040	0.030	15.00-17.00	1.50-2.50			60≤d≤160	600	800-950	12			
1.4713	X10CrAl7																	
1.4724	X10CrAl13																	
1.4742	X10CrAl18																	
1.4931	(GX23CrMoV12-1)		0.20-0.26	0.50-0.80	0.40	0.030	0.020	11.30-12.20	1.00	1.00-1.20	V 0.25-0.35; W 0.50							
1.4301	X5CrNi18-10	304	0.07	2.00	1.00	0.045	0.015	17.00-19.50	8.00-10.50	-	N 0.11	≤50	195	500-720	40L; 35T			
		304H	0.04-0.10	2.00	0.75	0.045	0.030	18.00-20.00	8.00-10.50	-	-	-	205 (ksi30)	515min (ksi75 min)	40.0			
1.4303	X5CrNi18-12	305	0.06	2.00	1.00	0.045	0.030	17.00-19.00	11.00-13.00	-	N 0.11	≤160 ≤250	190	500-700	45L; 35T			
1.4305	X10CrNiS18-9	303 8F B8F	0.10	2.00	1.00	0.045	0.15-0.35	17.00-19.00	8.00-10.00	-	N 0.11; Cu 1.00	≤160	190	500-750	35			
1.4306	X2CrNi19-11	304L	0.030	2.00	1.00	0.045	0.030	18.00-20.00	10.00-12.00	-	N 0.11	≤50	180	460-680	40L; 35T			
1.4307	(X2CrNi18-9)	304L	0.030	2.00	1.00	0.045	0.030	17.50-19.50	8.00-10.00	-	N 0.11	≤250	175	440	30			
1.4308**	GX5CrNi19-10	CF8	0.070	1.50	1.50	0.040	0.030	18.00-20.00	8.00-11.00	-	-	≤150	175	450-680	35			
1.4310	X12CrNi17-7	301	0.05-0.15	2.00	2.00	0.045	0.015	16.00-19.00	6.00-9.50	0.80	N 0.11	≤6 ≤40	250 195	600-950 500-750	40			
1.4311	X2CrNiN18-10	304LN	0.030	2.00	1.00	0.045	0.015	117.00-9.50	8.50-11.50	-	N 0.12-0.22	≤50	270	550-760	35L; 30T			

tabel C 2.3. (Continuare) *table C 2.3. (Continued)*

Germany		USA	Compozitia chimica Chemical Composition									Valori maxime % Maximum Values %		Proprietati mecanice Mechanical Properties			
Werkstoff	DIN (EN)	AISI	C	Mn	Si	P	S	Cr	Ni	Mo	Others	t	Limita de elasticitate	Rezistenta la rupere	Alung. Elong.		
													Yield Strength	Tensile Strength			
													mm	N/mm ² (min)		N/mm ² (min)	min%
1.4318	(X2CrNi N18-7)	301Ln	0.030	2.00	1.00	0.045	0.015	16.50-18.50	6.00-8.00	-	N 0.10-0.20	≤6 ≤12	350 330	650-850	40		
1.4319	X5CrNi 18-7	302															
1.4371	X12CrMn Ni18-85 (X2CrMn NiN17-7-5)	201	0.030	6.00-8.00	1.00	0.045	0.015	16.00-17.00	3.50-5.50	-	N 0.15-0.20	≤6 ≤75	300 280	650-850 630-830	45 35		
1.4372	(X2CrMn NiN17-7-5)	201	0.15	5.50-7.50	1.00	0.045	0.015	16.00-18.00	3.50-5.50	-	N 0.05-0.25	≤6 ≤75	350 330	750-950	45 40		
1.4373	(X12CrMnNi N18-9-5)		0.15	7.50-10.50	1.00	0.045	0.015	17.00-19.00	4.00-6.00	-	N 0.05-0.25	≤6 ≤75	340 320	680-880 600-800	45 35		
		202	0.15	7.5-10.0.	0.75	0.060	0.030	17.00-19.00	4.00-6.00	-	N 0.25		260 (ksi38)	620 (ksi90)	40		
1.4541	X6CrNiTi 18-10	321	0.08	2.00	1.00	0.045	0.015	17.00-19.00	9.00-12.00	-	Ti 5 x C to 0.70	≤6 ≤75	220 200	520-720 500-700	40		
1.4542	X5CrNiCu Nb16-4	630	0.07	1.50	0.70	0.040	0.015	15.00-17.00	3.00-5.00	0.60	Cu 3.00-5.00; Nb 5 x C to 0.45	≤6 ≤50	700-1150 600-1000	900-1300 850-1270	3-6 8-12		
		A240M 321H	0.04-0.10	2.00	0.75	0.045	0.030	17.00-19.00	9.00-12.00	-	Ti 4 x (C+N) to 0.70		205 (ksi30)	515 (ksi75min)	40		
1.4550	X6CrNiNb 18-10	347	0.08	2.00	1.00	0.045	0.015	17.00-19.00	9.00-12.00	-	Nb 10 x C to 1.00	≤75	200	500-700	40		
		347H	0.04-0.10	2.00	0.75	0.045	0.030	17.0-19.0	9.00-13.00	-	Cb 8 x C to 1.00		205 (ksi30)	515 (ksi75min)	40		
1.4567		S30430															
		304N	0.08	2.00	0.75	0.045	0.030	18.00-20.00	8.00-10.50	-	N 0.10-0.16		240 (ksi35)	550 (ksi 80min)	30		
1.4570	(X6CrNiCu 18 10 4Kd) (X6CrNiCu S18-9-2)																
		303Se	0.15	2.00	1.00	0.20	0.06	17.00-19.00	8.00-10.00	-	Se 0.15 min						
1.4162		S32101															
1.4313	(X3CrNi Mo13-4)		0.05	1.50	0.70	0.040	0.015	12.00-14.00	3.50-4.50	0.30-0.70	N 0.020	≤75	650	780-980	14		
1.4362	(X2CrNi N23-4)	S32304	0.030	2.00	1.00	0.035	0.015	22.00-24.00	3.50-5.50	0.10-0.60	N 0.05-0.20; Cu 0.10-0.60		400	600-850	20		
1.4410	(X2CrNiMo N25-7-4)	S32750 F53Cr25	0.030	2.00	1.00	0.035	0.015	24.00-26.00	6.00-8.00	3.00-4.50	N 0.20-0.35		515-550	730-1000	20		
1.4418	(X4CrNi Mo16.5.1)																
1.4462	X2CrNiMo N22-5	S32205 S31803 F51Cr22	0.030	2.00	1.00	0.035	0.015	21.00-23.00	4.50-6.50	2.50-3.50	N 0.10-0.22	≤75	445-460	640-840	25		
1.4501	X3CrNiMo N25-7	S32760 F55	0.030	1.00	1.00	0.035	0.015	24.00-26.00	6.00-8.00	3.00-4.00	N0.2-0.3; Cu0.5-1.0; W0.5-1.0	≤75	515-530	730-930	25		
1.4529	(X1NiCrMo CuN25-20-7)		0.020	1.00	0.50	0.030	0.010	19.00-21.00	24.00-26.00	6.00-7.00	Cu 0.50-1.50; N 0.15-0.25	≤75	300	650-850	40		
1.4401	X5CrNiMo 17-12(13)-2	316 8M B8M	0.07	2.00	1.00	0.045	0.015	16.50-18.50	10.00-13.00	2.00-2.50	N 0.11		205	510-710	40L; 35T		
1.4404	X2CrNiMo 17-12-2	316L 8M B8M	0.030	2.00	1.00	0.045	0.015	16.50-18.50	10.00-13.00	2.00-2.50	N 0.11		190	490-690	40L; 35T		
1.4406	X2CrNiMoN 17-12-2	316LN	0.030	2.00	1.00	0.045	0.015	16.50-18.50	10.00-12.00	2.00-2.50	N 0.12-0.22		280-300	580-780	40		
1.4408**	GX5CrNi Mo19-11-2		0.07	1.50	1.50	0.040	0.030	18.00-20.00	9.00-12.00	2.00-2.50		≤150	185	440	30		
1.4429	X2CrNiMoN 17-13-3	TP316 LN	0.030	2.00	1.00	0.045	0.015	16.50-18.50	11.00-14.00	2.50-3.00	N 0.12-0.22		295	580-800	35L; 30T		
1.4432	X2CrNiMo 17-12-2	316L	0.030	2.00	1.00	0.045	0.015	16.50-18.50	10.50-13.00	2.50-3.00	N 0.11	≤12 ≤75	220-240 220	550-700 520-670	40 45		
1.4434	(X2CrNiMo N18-12-4)	317LN	0.030	2.00	1.00	0.045	0.015	16.50-19.50	10.50-14.00	3.00-4.00	N 0.10-0.20	≤12 ≤75	270-290 270	550-700 540-740	35 40		
1.4435	X2CrNiMo 18-14-3	316L F1 38g2	0.030	2.00	1.00	0.045	0.015	17.00-19.00	12.50-15.00	2.50-3.00	N 0.11		190	490-690	40L; 35T		
		317	0.08	2.00	1.00	0.045	0.030	18.0-20.0	11.00-15.00	3.0-4.0	N 0.10		205 (ksi30)	515 (ksi75)	40		
1.4436	X5CrNiMo 17-12-3	316	0.05	2.00	1.00	0.045	0.015	16.50-18.50	10.50-13.00	2.50-3.00	N 0.11		205	510-710	40 L; 35 T		
1.4438	X2CrNiMo 17-16-4 X2CrNiMo 18-16-4	317L	0.030	2.00	1.00	0.045	0.015	17.50-19.50	13.00-16.00	3.00-4.00	N 0.11	≤12 ≤75	220-240 220	550-700 520-670	35 40		
1.4439	X2CrNiMoN 17-13-5	317LMN	0.030	2.00	1.00	0.045	0.015	16.50-18.50	12.40-14.50	4.00-5.00	N 0.12-0.22		285	580-800	35L;30T		
1.4460	X8CrNiMo 27-5*	329*	0.05	2.00	1.00	0.035	0.030	25.00-28.00	4.50-6.50	1.30-2.00	N 0.05-0.20	≤160	460	620-880	20L;15T		
1.4539	(X1NiCrMo Cu25-20-5)	904L	0.020	2.00	0.70	0.030	0.010	19.00-21.00	24.00-26.00	4.00-5.00	Cu 1.20-2.00; N 0.15	≤12 ≤75	220-240 220	530-730 520-720	35		
1.4547	(X1CrNiMo CuN20-18-7)	S31254 F44	0.020	1.00	0.80	0.03	0.010	19.50-20.50	17.50-18.50	6.00-6.50	N 0.18-0.22; Cu 0.50-1.00		300 (ksi44)	650 (ksi94)	35		

tabel C 2.3. (Incheiere) table C 2.3. (Concluded)

Germany		USA	Compozitia chimica Chemical Composition									Valori maxime % Maximum Values %			Proprietati mecanice Mechanical Properties			
Werkstoff	DIN (EN)	AISI	C	Mn	Si	P	S	Cr	Ni	Mo	Others	t	Limita de elasticitate Yield Strength	Rezistenta la rupere Tensile Strength	Alung. Elong.			
												mm	N/mm ² (min)	N/mm ² (min)		min%		
												1.4565		S34565				
1.4571 Tubes	X6CrNiMo Ti17-12-2	316Ti	0.08	-	-	-	-	16.50-18.50	10.5-13.5	2.0-2.5	Ti 5 x C to 0.80	≤50	210	500-730	35L;30T			
1.4571 Plates	(X6CrNiMo Ti17-12-2)	316Ti	0.08	2.00	1.00	0.045	0.015	16.50-18.50	10.50-13.50	2.00-2.50	Ti 5 x C - 0.70	≤12 ≤75	220-240 220	540-690 520-670	40			
1.4573	X10CrNiMo Ti18-12																	
1.4580	(X6CrNiMoNb17-12-2)		0.08	2.00	1.00	0.045	0.015	16.50-18.50	10.50-13.50	2.00-2.50	Nb 10 x C to 1.0	≤75	220	520-720	40			
1.4583	X10CrNiMo Nb18-12																	
1.4598	(X2CrNiMoCuS17-10-2)																	
1.4818		S30415																
1.4821	X20CrNi Si25-4																	
1.4828	X15CrNi S20-12	309																
1.4833	(X6CrNi 22-13)	309S	0.15	2.00	1.00	0.045	0.015	22.00-24.00	12.00-15.00	-	N 0.11	≤75	210	500-700	See Standard			
1.4835	(X9CrNiSi NCe21-11-1)	S30815																
1.4841 bar	X15CrNi Si25-20	314	0.20	2.00	1.50-2.50	0.045	0.015	24.00-26.00	19.00-22.00	-	N 0.11	-	230	550-750	See Standard			
1.4845	X2CrNi25-21	310																
	(X8CrNi 25-21) Tubes	310S	0.08	2.00	1.50	0.045	0.030	24.0-26.0	19.00-22.00	-	-	-	205 (ksi30)	515 (ksi75min)	40			
1.4854		S35315																
1.4864	X12NiCr Si35-16	330																
1.4878	X8CrNi Ti18-10	321	0.08	2.00	0.75	0.045	0.030	17.0-19.0	9.00-12.00	-	Ti 5 x (C+N) to 0.70; N 0.10	-	205 (ksi30)	515 (ksi75min)	40			
1.4910	X3CrNiMo N17-13		0.04	2.00	0.75	0.035	0.015	16.0-18.0	12.00-14.00	2.0-2.8	B 0.0015-0.0050; N 0.10-0.18	≤50	260	550-750	35L; 30T			
	(X3CrNiMo N17-13-3*)																	
1.4912	(X7CrNi Nb18-10*)		0.04-0.10	2.00	1.00	0.045	0.015	17.00-19.00	9.00-12.00	-	Nb 10 x C to 1.20	≤450	205	510-710	40L; 30T			
1.4941 Plates	X8CrNi Ti18 10		0.04-0.08	2.00	1.00	0.035	0.015	17.00-19.00	9.00-12.00	-	Ti 5 x C to 0.80; B 0.0015-0.0050	≤12 ≤75	200-220 200	510-710 490-690	40			
1.4948 Tubes	X6Cr Ni18 11	304H	0.04-0.08	2.00	0.75	0.035	0.015	17.00-19.00	10.00-12.00	-	-	≤50	185	500-700	40L; 30T			

- * Oteluri inox forjate
Forged Stainless Steels
** Oteluri inox turnate
Cast Stainless Steels

D. MEMORATOR
VADE MECUM

1. Proprietati fizice pentru diferite elemente chimice sau materiale *Physical properties for different Chemical elements or Materials*

1.1. Corespondenta intre masa otelului si alte metale *Weight Conversions from Steel to Other Metals*

tabel D 1.1. *table D 1.1.*

GREUTATEA OTELULUI IN COMPARATIE CU DIFERITE MATERIALE PENTRU VOLUME EGALE WEIGHT CONVERSIONS FROM STEEL TO OTHER MATERIALS FOR EQUIVALENT VOLUMES							
Material		Material		Material		Material	
Aluminiu 1100 <i>Aluminum 1100</i>	0.3462	Aluminiu 7178 <i>Aluminum 7178</i>	0.3702	Inox serie 400 <i>Stainless 400 series</i>	1.0000	Monel 405 <i>Monel 405</i>	1.1270
Aluminiu 2011 <i>Aluminum 2011</i>	0.3604	Aluminiu pur <i>Aluminum pure</i>	0.3640	Magneziu <i>Magnesium</i>	0.2230	Monel 500 <i>Monel 500</i>	1.0780
Aluminiu 2014 <i>Aluminum 2014</i>	0.3568	Aluminiu aliat <i>Aluminum Alloys</i>	0.3560	Molibden <i>Molybdenum</i>	1.3210	Tantal <i>Tantalum</i>	2.1420
Aluminiu 2017 <i>Aluminum 2017</i>	0.3568	Alama <i>Brass</i>	1.0840	Nichel 200 <i>Nickel 200</i>	1.1340	Titan Aliat <i>Titanium Alloys</i>	0.5750
Aluminiu 2024 <i>Aluminum 2024</i>	0.3533	Aur <i>Gold</i>	2.4590	Nichel 400 <i>Nickel 400</i>	1.1250	Otel rapid pentru scule <i>Tool Steel-High Speed</i>	1.1200
Aluminiu 3003 <i>Aluminum 3003</i>	0.3498	Bronz 90 <i>Bronze 90</i>	1.1180	Nichel 600 <i>Nickel 600</i>	1.0720	Otel W/Mo pentru scule <i>Tool Steel-Tungsten/Moly</i>	1.0400
Aluminiu 5052 <i>Aluminum 5052</i>	0.3427	Columbiu <i>Columbium</i>	1.1070	Nichel 625 <i>Nickel 625</i>	1.0750	Wolfram <i>Tungsten</i>	2.4640
Aluminiu 5083 <i>Aluminum 5083</i>	0.3392	Cupru <i>Copper</i>	1.1480	Nichel 800 <i>Nickel 800</i>	1.0120	Zinc <i>Zinc</i>	0.9040
Aluminiu 6061 <i>Aluminum 6061</i>	0.3462	Cupru aliat <i>Copper alloys</i>	1.1200	Nichel 904L <i>Nickel 904L</i>	1.0260	Zirconiu <i>Zirconium</i>	0.8350
Aluminiu 6063 <i>Aluminum 6063</i>	0.3462	Inox serie 200 <i>Stainless 200 series</i>		Niobiu <i>Niobium</i>	1.1070		
Aluminiu 7075 <i>Aluminum 7075</i>	0.3568	Inox serie 300 <i>Stainless 300 series</i>	1.0100	Monel 400 * <i>Monel 400 *</i>	1.1270		

* Monel este un aliaj nichel-cupru care contine minimum 63% nichel
Monel metal is a nickel-copper alloy, containing minimum 63% nickel.

1.2. Simbol, densitate, punct de topire, punct de fierbere Symbol, Density, Melting point, Boiling point

tabel D 1.2. table D 1.2.

Numele	Name	Simbol Symbol	Densitate Density gr/cm3	Punct de topire Melting point (°C)	Punct de fierbere Boiling point (°C)	Numele	Name	Simbol Symbol	Densitate Density gr/cm3	Punct de topire Melting point (°C)	Punct de fierbere Boiling point (°C)
Actiniu	Actinium	Ac	10.07	1050	3197.85	Osmiu	Osmium	Os	22.61	3027	5011.85
Aluminiu	Aluminum	Al	2.698	660.25	2518.85	Oxigen	Oxygen	O	0.001429	-222.65	-182.95
Americiu	Americium	Am	13.69	994	2606.85	Paladiu	Palladium	Pd	12.02	1552	2962.85
Argent	Silver	Ag	10.501	961	2161.85	Platina	Platinum	Pt	21.46	1772	3824.85
Argon	Argon	Ar	0.0017837	-189.19	-185.85	Plumb	Lead	Pb	11.342	327.6	1748.85
Arsenic	Arsenic	As	5.776	817.007	613.85	Plutoniu	Plutonium	Pu	19.84	640	3227.85
Astatiniu	Astatine	At	7	302	336.85	Poloniu	Polonium	Po	9.32	254	961.85
Aur	Gold	Au	19.282	1064.58	2855.85	Potasiu	Potassium	K	0.862	63.35	758.85
Azot	Nitrogen	N	0.0012506	-209.86	-195.79	Praseodim	Praseodymium	Pr	6.773	931	3519.85
Bariu	Barium	Ba	3.594	729	1896.85	Prometiu	Promethium	Pm	7.26	931	2999.85
Beriliu	Beryllium	Be	1.85	1287	2468.85	Protactiniu	Protactinium	Pa	15.37	1600	4026.85
Berkeliu	Berkelium	Bk	14.79	986	709.85	Radiu	Radium	Ra	5.5	700	1736.85
Bismut	Bismuth	Bi	9.807	271.52	1563.85	Radon	Radon	Rn	0.00973	-71	-61.85
Bohriu	Bohrium	Bh	37	-	-	Reniu	Rhenium	Re	21.02	3180	5595.85
Bor	Boron	B	2.34	2300	3926.85	Rodiu	Rhodium	Rh	12.41	1966	3694.85
Brom	Bromine	Br	3.122	-7.1	58.85	Rubidiu	Rubidium	Rb	1.532	39.64	687.85
Cadmium	Cadmium	Cd	8.69	321.18	766.85	Rutheniu	Ruthenium	Ru	12.37	2250	4149.85
Calciu	Calcium	Ca	1.54	839	1483.85	Rutherfordiu	Rutherfordium	Rf	18.1	-	-
Californiu	Californium	Cf	15.1	1652	899.85	Samariu	Samarium	Sm	7.52	1072	1793.85
Carbon	Carbon	C	2.267	3675.007	4026.85	Scandiu	Scandium	Sc	2.989	1539	2835.85
Ceriu	Cerium	Ce	6.77	798	3442.85	Seaborgiu	Seaborgium	Sg	35	-	-
Cesiu	Caesium	Cs	1.873	28.55	670.85	Seleniu	Selenium	Se	4.809	221	684.85
Clor	Chlorine	Cl	0.003214	-100.84	-34.04	Siliciu	Silicon	Si	2.3296	1410	3264.85
Cobalt	Cobalt	Co	8.86	1495	2926.85	Sodiu	Sodium	Na	0.971	98	882.85
Crom	Chromium	Cr	7.15	1857	2670.85	Staniu	Tin	Sn	7.287	232.06	2601.85
Cupru	Copper	Cu	8.96	1084.6	2561.85	Stibiu	Antimony	Sb	6.685	630.9	1586.85
Curium	Curium	Cm	13.51	1067	3109.85	Strontiu	Strontium	Sr	2.64	769	1381.85
Disprosiu	Dysprosium	Dy	8.55	1407	2566.85	Sulf	Sulfur	S	2.067	115.36	444.65
Dubniu	Dubnium	Db	39	-	-	Taliu	Thallium	Tl	11.85	304	1472.85
Einsteinium	Einsteinium	Es	13.5	860	-	Tantal	Tantalum	Ta	16.654	2996	5457.85
Erbium	Erbium	Er	9.066	1522	3229.85	Tehnetiu	Technetium	Tc	11.5	2200	4876.85
Europiu	Europium	Eu	5.243	822	1528.85	Telur	Tellurium	Te	6.232	449.65	987.85
Fier	Iron	Fe	7.874	1535	2860.85	Terbiu	Terbium	Tb	8.229	1357	3229.85
Flor	Fluorine	F	0.001696	-219.52	-188.12	Titan	Titanium	Ti	4.54	1660	3286.85
Fosfor	Phosphorus	P	1.82	44.1	279.85	Toriu	Thorium	Th	11.72	1755	4787.85
Franciu	Francium	Fr	1.87	27	676.85	Tuliu	Thulium	Tm	9.321	1545	1949.85
Gadolinium	Gadolinium	Gd	7.895	1312	3272.85	Uraniu	Uranium	U	18.95	1132	4130.85
Galiu	Gallium	Ga	5.907	29.76	2203.85	Vanadiu	Vanadium	V	6.11	1902	3406.85
Germaniu	Germanium	Ge	5.323	938.3	2832.85	Wolfram	Tungsten	W	19.25	3407	5554.85
Hafniu	Hafnium	Hf	13.31	2227	4602.85	Xenon	Xenon	Xe	0.005887	-111.7	-108.12
Hassiu	Hassium	Hs	41	-	-	Yterbiu	Ytterbium	Yb	6.965	824	1195.85
Helium	Helium	He	0.0001785	-272.2	-268.93	Ytriu	Yttrium	Y	4.469	1526	3335.85
Hidrogen	Hydrogen	H	8.988x10 ⁻⁵	-258.975	-252.87	Zinc	Zinc	Zn	7.134	419.73	906.85
Holmiu	Holmium	Ho	8.795	1470	2719.85	Zirconiu	Zirconium	Zr	6.506	1852	4408.85
Indiu	Indium	In	7.31	156.76	2071.85						
Iod	Iodine	I	4.93	113.5	184.25						
Iridiu	Iridium	Ir	22.56	2443	4427.85						
Kripton	Krypton	Kr	0.003733	-157.22	-153.22						
Lantan	Lanthanum	La	6.145	920	3463.85						
Litiu	Lithium	Li	0.534	180.7	1341.85						
Lutetiu	Lutetium	Lu	9.84	1663	3401.85						
Magneziu	Magnesium	Mg	1.738	650	1089.85						
Mangan	Manganese	Mn	7.44	1246	2060.85						
Meitneriu	Meitnerium	Mt	35	-	-						
Mercur	Mercury	Hg	13.5336	-38.72	356.85	Apa dulce	Water (fresh)		1	gheata ice 0	100
Molibden	Molybdenum	Mo	10.22	2617	4638.85	Apa sarata	Water (salt)		1.030	gheata ice -2	
Neodim	Neodymium	Nd	7.007	1016	3073.85	Atmosfera terestra	Earth's atmosphere		0.0012		
Neon	Neon	Ne	0.0008999	-248.447	-246.08	Ghiata	Ice		0.9167	0	
Neptuniu	Neptunium	Np	20.45	640	3999.85	Glicerina	Glycol		1.261		
Nichel	Nickel	Ni	8.912	1453	2912.85	Pamantul	The Earth		5.5153		
Niobiu	Niobium	Nb	8.57	2468	4743.85	Plastic	Plastics		0.85 - 1.40		

2. Unitati de masura Measurement Units

2.1. Unitati de lungime Length Units

tabel D 2.1.1 table D 2.1.1

UNIT NAME	NUMELE UNITATII	SIMBOL SYMBOL	DEFINITIE DEFINITION	CORESPONDENTA CU S.I. RELATION TO S.I. UNITS
ångström	ångström	Å	≡ 1×10^{-10} m	≡ 0.1 nm
astronomical unit	astronomica, unitatea	AU	≈ Distanța de la pamant la soare ≈ <i>Distance from Earth to Sun</i>	≈ 149597871464 m
barleycorn	barleycorn		= 1/3 in (see note above about rounding)	≈ 8.46×10^{-3}
bohr, atomic unit of length	bohr, atomic unit of length	a0	≡ Bohr radius of hydrogen	≈ $5.2917720859 \times 10^{-11}$ ± 3.6×10^{-20} m
cable length (Imperial)	cablu lung (Imperial)		≡ 608 ft	≈ 185.3184 m
cable length (International)	cablu lung (International)		≡ 1/10 nmi	≡ 185.2 m
cable length (U.S.)	cable lung (SUA)		≡ 720 ft	≈ 219.456 m
chain (Gunter's; Surveyor's)	lant (Gunter's; Surveyor's)	ch	≡ 66 ft(US Survey) ≡ 4 rods	≈ 20.11684 m
cubit	cot		≡ Distance from fingers to elbow ≈ 18 in ≡ <i>Distance from fingers to elbow ≈ 18 in</i>	≈ 0.5 m
ell	ell	ell	≡ 45 in (In England usually)	= 1.143 m
fathom	stanjen	fm	≡ 6 ft	= 1.8288 m
fermi	fermi	fm	≡ 1×10^{-15} m	≡ 1×10^{-15} m
finger	deget		≡ 7/8 in	= 0.022225 m
finger (cloth)	deget (panza)		≡ 4½ in	= 0.1143 m
foot (Benoit)	picior (Benoit)	ft (Ben)		≈ 0.304799735 m
foot (Clarke's; Cape)	picior (Clarke's; Cape)	ft (Cla)		≈ 0.3047972654 m
foot (Indian)	picior (Indian)	ft Ind		≈ 0.304799514 m
foot (International)	picior (International)	ft	≡ 1/3 yd ≡ 0.3048 m ≡ 12 inches	≡ 0.3048 m
foot (Sear's)	picior (Sear's)	ft (Sear)		≈ 0.30479947 m
foot (U.S. Survey)	picior (SUA Survey)	ft (US)	≡ 1200/3937 m	≈ 0.304800610 m
furlong	furlong	fur	≡ 10 chains = 660 ft = 220 yd	= 201.168 m
hand	brat		≡ 4 in	≡ 0.1016 m
inch (International)	tol (inch) (International)	in	≡ 1/36 yd ≡ 1/12 ft	≡ 0.0254 m
league (land)	leghe (terestra)	lea	≡ 3 US Statute miles	= 4828.032 m
light-day	lumina, zi		≡ 24 light-hours ($1.0792528488 \times 10^{12}$ m)	≡ $2.59020683712 \times 10^{13}$ m
light-second	lumina, secunda		≡ Distance light travels in one second in vacuum	≡ 299792458 m
light-year	lumina, an	ly	≡ Distanța parcursă de lumina in vacuum in 365.25 zile ≡ Distance light travels in vacuum in 365.25 days	= $9.4607304725808 \times 10^{15}$ m
line	linie	ln	≡ 1/12 in	= 0.002116 m
link (Gunter's; Surveyor's)	link (Gunter's; Surveyor's)	lnk	≡ 1/100 ch ≡ 0.66 ft ≡ 7.92in	= 0.201168 m
link (Ramsden's; Engineer's)	link (Ramsden's; Engineer's)	lnk	≡ 1 ft	= 0.3048 m
metre (SI base unit)	metru (SI base unit)	m	≡ Distance light travels in 1/299792458 of a second in vacuum ≈ 1/10000000 of the distance from equator to pole.	≡ 1 m
mickey	mickey		≡ 1200 in	= 1.27×10^{-4} m
micron	micron	μ		≡ 1×10^{-6} m
mil (Sweden and Norway)	mil (Suedia and Norvegia)	mil	≡ 10 km	= 10000 m
mil; thou	mil; thou	mil	≡ 1×10^{-3} in	≡ 2.54×10^{-5} m
mile (geographical)	mila (geographical)		≡ 6082 ft	= 1853.7936 m
mile (international)	mila (international)	mi	≡ 80 chains ≡ 5280 ft ≡ 1760 yd	≡ 1609.344 m
mile (tactical or data)	mila (tactical or data)		≡ 6000 ft	≡ 1828.8 m
mile (telegraph)	mila (telegraph)	mi	≡ 6087 ft	= 1855.3176 m
mile (U.S. Survey)	mila (SUA Survey)	mi	≡ 5280 US Survey feet ≡ (5280 × 1200/3937) m	≈ 1609.347219 m
nail (cloth)	cui (panza)		≡ 2¼ in	= 0.057 15 m
nautical league	leghe nautica	NL; nl	≡ 3 nmi	= 5556 m
nautical mile (Admiralty)	mila nautica (Admiralty)	NM (Adm) nmi (Adm)	= 6080 ft	= 1853.184 m
nautical mile (international)	mila marina (international)	NM; nmi	≡ 1852 m	≡ 1852 m
nautical mile (US pre 1954)	mila nautica (SUA pre 1954)		≡ 1853.248 m	≡ 1853.248 m
pace	pas		≡ 2.5 ft	= 0.762 m
palm	palm		≡ 3 in	= 0.0762 m
pica	pica		≡ 12 points	Dependent on point measures.

tabel D 2.1.1. (Continuare) table D 2.1.1. (Continued)

<i>point (American, English)</i>	punct (American, English)	pt	≡ 1/72.272 in	≈ 0.000 351 450 m
<i>point (Didot; European)</i>	punct (Didot; European)	pt	≡ 1/12 × 1/72 of pied du roi; ≡ 5/133 cm - After 1878	≈ 0.000 375 97 m; ≈ 0.000 375 939 85 m - After 1878
<i>point (PostScript)</i>	punct (PostScript)	pt	≡ 1/72 in	= 0.000 352 7 m
<i>point (TeX)</i>	punct (TeX)	pt	≡ 1/72.27 in	= 0.000 351 4598 m
<i>quarter</i>	sfert		≡ ¼ yd	= 0.2286 m
<i>rod; pole; perch</i>	rod; pole; perch	rd	≡ 16½ ft	= 5.0292 m
<i>rope</i>	sfoara	rope	≡ 20 ft	= 6.096 m
<i>span</i>	schioapa		≡ 9 in	= 0.2286 m
<i>spat</i>	spat			≡ 1×10 ¹² m
<i>stick</i>	stick		≡ 2 in	= 0.0508 m
<i>twip</i>	twip	twip	≡ 1/1440 in	= 1.7638×10 ⁻⁵ m
<i>x unit; siegbahn</i>	x unit; siegbahn	xu		≈ 1.0021×10 ⁻¹³ m
yard (International)	yard (International)	yd	≡ 3 ft ≡ 36 in	≡ 0.9144 m

tabel D 2.1.2. table D 2.1.2.

TABEL DE ECHIVALENTA PENTRU UNITATI DE LUNGIME				EQUIVALENCE TABLE FOR LENGTH UNITS				
=	metru <i>meter</i>	milimetru <i>millimeter</i>	țol <i>inch</i>	picioare <i>feet</i>	yard <i>yard</i>	furlong <i>furlong</i>	mila marina <i>nautical mile</i>	mila terestra <i>statute mile</i>
	m	mm	''	ft	yd	fur	naut. mile	statute mile
1 m	1	10 ³	39.37	3.28084	1.094	4.97097×10 ⁻³	5.396×10 ⁻⁴	6.214×10 ⁻⁴
1 mm	10 ⁻³	1	39.37×10 ⁻³	3.281×10 ⁻³	1.094×10 ⁻³	4.97097×10 ⁻⁶	5.396×10 ⁻⁴	6.214×10 ⁻⁷
1 inch	0.0254	25.4	1	0.96784	2.778×10 ⁻³	1.2626×10 ⁻⁴	1.371×10 ⁻⁵	1.578×10 ⁻³
1 foot	0.3048	304.8	12	1	0.3334	1.51515×10 ⁻³	1.645×10 ⁻⁴	1.894×10 ⁻⁴
1 yard	0.9144	914.4	36	3	1	4.54545×10 ⁻³	0.4937×10 ⁻³	0.5682×10 ⁻³
1 furlong	201.168	201168	7920	660	220	1	0.108553	0.125
1 mile (naut.)	1852	1852×10 ³	72913.386	6076.115	2025.372	9.21212	1	1.15152
1 mile (stat.)	1609.344	1609×10 ³	63360	5280	1760	8	0.869	1

2.2. Unitati de suprafata Area Units

tabel D 2.2.1. table D 2.2.1.

UNIT NAME	NUMELE UNITATII	SIMBOL SYMBOL	DEFINIE DEFINITION	CORESPONDENTA CU S.I. RELATION TO S.I. UNITS
<i>acre (international)</i>	acru (international)	ac	≡ 1 ch × 10 ch = 4840 sq yd	≡ 4 046.856 4224 m ²
<i>acre (U. S. survey)</i>	acru (SUA survey)	ac	≡ 10 sq ch = 4840 sq yd, also 43560 sq ft.	≈ 4 046.873 m ²
are	ar	a	≡ 100 m ²	= 100 m ²
<i>barn</i>	barn	b	≡ 10 ⁻²⁸ m ²	= 10 ⁻²⁸ m ²
<i>barony</i>	baron		≡ 4000 ac	≈ 1.618 742×10 ⁷ m ²
<i>board</i>	board	bd	≡ 1 in × 1 ft	= 7.741 92×10 ⁻³ m ²
<i>circular inch</i>	inch (țol) circular	circ in	≡ π/4 sq in	≈ 5.067 075×10 ⁻⁴ m ²
<i>circular mil; circular thou</i>	mil circular; thou circular	circ mil	≡ π/4 mil ²	≈ 5.067 075×10 ⁻¹⁰ m ²
<i>cord</i>	cord		≡ 192 bd	= 1.486 448 64 m ²
<i>dunam</i>	dunam		≡ 1 000 m ²	= 1 000 m ²
<i>guntha (India)</i>	guntha (India)		≡ 121 sq yd ; 40 Guntas = 1 acre	≈ 101.17 m ²
hectare	hectar	ha	≡ 10 000 m ²	≡ 10 000 m ²
<i>rood</i>	rood	ro	≡ ¼ ac	= 1 011.714 1056 m ²
<i>section</i>	sector		≡ 1 mi × 1 mi	= 2.589 988 110 336×10 ⁶ m ²
<i>square (roofing)</i>	patrat (acoperire)		≡ 10 ft × 10 ft	= 9.290 304 m ²
<i>square chain (international)</i>	lant la patrat (international)	sq ch	≡ 66 ft × 66 ft = 1/10 ac	≡ 404.685 642 24 m ²
<i>square chain (U.S. Survey)</i>	lant la patrat (SUA Survey)	sq ch	≡ 66 ft(US) × 66 ft(US) = 1/10 ac	≈ 404.687 3 m ²
square foot	picior patrat	sq ft	≡ 1 ft × 1 ft	≡ 9.290 304×10 ⁻² m ²
<i>square foot (U.S. Survey)</i>	picior patrat (SUA Survey)	sq ft	≡ 1 ft (US) × 1 ft (US)	≈ 9.290 341 161 327 49×10 ⁻² m ²
square inch	inch (țol) patrat	sq in	≡ 1 in × 1 in	≡ 6.4516×10 ⁻⁴ m ²
<i>square kilometre</i>	kilometru patrat	km²	≡ 1 km × 1 km	= 10 ⁶ m ²
<i>square link (Gunter's) (International)</i>	link patrat (Gunter's)(International)	sq lnk	≡ 1 lnk × 1 lnk ≡ 0.66 ft × 0.66 ft	= 4.046 856 4224×10 ⁻² m ²
<i>square link (Gunter's) (US Survey)</i>	square link (Gunter's) (SUA Survey)	sq lnk	≡ 1 lnk × 1 lnk ≡ 0.66 ft(US) × 0.66 ft(US)	≈ 4.046 872×10 ⁻² m ²
<i>square link (Ramsden's)</i>	square link (Ramsden's)	sq lnk	≡ 1 lnk × 1 lnk ≡ 1 ft × 1 ft	= 0.09290304 m ²
square metre (SI unit)	metru patrat (SI unit)	m²	≡ 1 m × 1 m	= 1 m ²
<i>square mil; square thou</i>	mil patrat; thou patrat	sq mil	≡ 1 mil × 1 mil	= 6.4516×10 ⁻¹⁰ m ²
square mile	mila patrata	sq mi	≡ 1 mi × 1 mi	= 2.589 988 110 336×10 ⁶ m ²
<i>square mile (U.S. Survey)</i>	mila patrata (SUA Survey)	sq mi	≡ 1 mi (US) × 1 mi (US)	≈ 2.589 988 47×10 ⁶ m ²
<i>square rod/pole/perch</i>	square rod/pole/perch	sq rd	≡ 1 rd × 1 rd	= 25.292 852 64 m ²
square yard (International)	yard patrat (International)	sq yd	≡ 1 yd × 1 yd	≡ 0.836 127 36 m ²
<i>stremma</i>	stremma		≡ 1 000 m ²	= 1 000 m ²

2.3. Unitati de volum si capacitate Volume and Capacity Units

tabel D 2.3.1. table D 2.3.1.

UNIT NAME	NUMELE UNITATII	SIMBOL SYMBOL	DEFINITIE DEFINITION	CORESPONDENTA CU S.I. RELATION TO S.I. UNITS
acre-foot	acru-picior	ac ft	$\equiv 1 \text{ ac} \times 1 \text{ ft} = 43\,560 \text{ ft}^3$	$= 1\,233.481\,837\,547\,52 \text{ m}^3$
acre-inch	acru-inch (tol)		$\equiv 1 \text{ ac} \times 1 \text{ in}$	$= 102.790\,153\,128\,96 \text{ m}^3$
barrel (Imperial)	barrel (Imperial)	bl (Imp)	$\equiv 36 \text{ gal (Imp)}$	$= 0.163\,659\,24 \text{ m}^3$
barrel (petroleum)	barrel (petrol)	bl; bbl	$\equiv 42 \text{ gal (US)}$	$= 0.158\,987\,294\,928 \text{ m}^3$
barrel (U.S. dry)	barrel (SUA uscat)	bl (US)	$\equiv 105 \text{ qt (US)} = 105/32 \text{ bu (US lvi)}$	$= 0.115\,628\,198\,985\,075 \text{ m}^3$
barrel (U.S. fluid)	barrel (SUA lichid)	fl bl (US)	$\equiv 31\frac{1}{2} \text{ gal (US)}$	$= 0.119\,240\,471\,196 \text{ m}^3$
board-foot	board-foot	fbm	$\equiv 144 \text{ cu in}$	$\equiv 2.359\,737\,216 \times 10^{-3} \text{ m}^3$
bucket (Imperial)	galeata (Imperial)	bkt	$\equiv 4 \text{ gal (Imp)}$	$= 0.018\,184\,36 \text{ m}^3$
bushel (Imperial)	banita (Imperial)	bu (Imp)	$\equiv 8 \text{ gal (Imp)}$	$= 0.036\,368\,72 \text{ m}^3$
bushel (U.S. dry heaped)	banita (SUA uscat cu varf)	bu (US)	$\equiv 1\frac{1}{4} \text{ bu (US lvi)}$	$= 0.044\,048\,837\,7086 \text{ m}^3$
bushel (U.S. dry level)	banita (SUA uscat ras)	bu (US lvi)	$\equiv 2\,150.42 \text{ cu in}$	$= 0.035\,239\,070\,166\,88 \text{ m}^3$
butt, pipe	butt, pipe		$\equiv 126 \text{ gal (wine)}$	$= 0.476\,961\,884\,784 \text{ m}^3$
coomb	coomb		$\equiv 4 \text{ bu (Imp)}$	$= 0.145\,474\,88 \text{ m}^3$
cord (firewood)	cord (firewood)		$\equiv 8 \text{ ft} \times 4 \text{ ft} \times 4 \text{ ft}$	$= 3.624\,556\,363\,776 \text{ m}^3$
cord-foot	cord-foot		$\equiv 16 \text{ cu ft}$	$= 0.453\,069\,545\,472 \text{ m}^3$
cubic fathom	cubic fathom	cu fm	$\equiv 1 \text{ fm} \times 1 \text{ fm} \times 1 \text{ fm}$	$= 6.116\,438\,863\,872 \text{ m}^3$
cubic foot	picior cubic	cu ft	$\equiv 1 \text{ ft} \times 1 \text{ ft} \times 1 \text{ ft}$	$\equiv 0.028\,316\,846\,592 \text{ m}^3$
cubic inch	inch (tol) cub	cu in	$\equiv 1 \text{ in} \times 1 \text{ in} \times 1 \text{ in}$	$\equiv 16.387\,064 \times 10^{-6} \text{ m}^3$
cubic metre (SI unit)	metru cub (SI unit)	m³	$\equiv 1 \text{ m} \times 1 \text{ m} \times 1 \text{ m}$	$\equiv 1 \text{ m}^3$
cubic mile	mila cubica	cu mi	$\equiv 1 \text{ mi} \times 1 \text{ mi} \times 1 \text{ mi}$	$\equiv 4\,168\,181\,825.440\,579\,584 \text{ m}^3$
cubic yard	yard cubic	cu yd	$\equiv 27 \text{ cu ft}$	$\equiv 0.764\,554\,857\,984 \text{ m}^3$
dash (Imperial)	dash (Imperial)		$\equiv 1/384 \text{ gi (Imp)} = \frac{1}{2} \text{ pinch (Imp)}$	$= 369.961\,751\,302\,08\,3 \times 10^{-9} \text{ m}^3$
dash (U.S.)	dash (SUA)		$\equiv 1/96 \text{ US fl oz} = \frac{1}{2} \text{ US pinch}$	$= 308.057\,599\,609\,375 \times 10^{-9} \text{ m}^3$
dessertspoon (Imperial)	dessertspoon (Imperial)		$\equiv 1/12 \text{ gi (Imp)}$	$= 11.838\,776\,0416 \times 10^{-6} \text{ m}^3$
drop (Imperial)	drop (Imperial)	gtt	$\equiv 1/288 \text{ fl oz (Imp)}$	$= 98.656\,467\,013\,8 \times 10^{-9} \text{ m}^3$
drop (Imperial) (alt)	drop (Imperial) (alt)	gtt	$\equiv 1/1\,824 \text{ gi (Imp)}$	$\approx 77.886\,684 \times 10^{-9} \text{ m}^3$
drop (medical)	drop (medical)		$\equiv 1/12 \text{ ml}$	$= 83.03 \times 10^{-9} \text{ m}^3$
drop (metric)	drop (metric)		$\equiv 1/20 \text{ mL}$	$= 50.0 \times 10^{-9} \text{ m}^3$
drop (U.S.)	drop (SUA)	gtt	$\equiv 1/360 \text{ US fl oz}$	$= 82.148\,693\,22916 \times 10^{-9} \text{ m}^3$
drop (U.S.) (alt)	drop (SUA) (alt)	gtt	$\equiv 1/456 \text{ US fl oz}$	$\approx 64.854\,231 \times 10^{-9} \text{ m}^3$
fifth	fifth		$\equiv 1/5 \text{ US gal}$	$= 757.082\,3568 \times 10^{-6} \text{ m}^3$
firkin	firkin		$\equiv 9 \text{ gal (US)}$	$= 0.034\,068\,706\,056 \text{ m}^3$
fluid drachm (Imperial)	fluid drachm (Imperial)	fl dr	$\equiv \frac{1}{8} \text{ fl oz (Imp)}$	$= 3.551\,632\,8125 \times 10^{-6} \text{ m}^3$
fluid dram (U.S.); U.S. fluidram	fluid dram (SUA); SUA fluidram	fl dr	$\equiv \frac{1}{8} \text{ US fl oz}$	$= 3.696\,691\,195\,3125 \times 10^{-6} \text{ m}^3$
fluid scruple (Imperial)	fluid scruple (Imperial)	fl s	$\equiv 1/24 \text{ fl oz (Imp)}$	$= 1.183\,877\,60416 \times 10^{-6} \text{ m}^3$
gallon (beer)	gallon (bere)	beer gal	$\equiv 282 \text{ cu in}$	$= 4.621\,152\,048 \times 10^{-3} \text{ m}^3$
gallon (Imperial)	gallon (Imperial)	gal (Imp)	$\equiv 4.546\,09 \text{ L}$	$\equiv 4.546\,09 \times 10^{-3} \text{ m}^3$
gallon (U.S. dry)	gallon (SUA uscat)	gal (US)	$\equiv \frac{1}{8} \text{ bu (US lvi)}$	$= 4.404\,883\,770\,86 \times 10^{-3} \text{ m}^3$
gallon (US petrol; wine)	gallon (SUA petrol; vin)	gal (US)	$\equiv 231 \text{ cu in}$	$\equiv 3.785\,411\,784 \times 10^{-3} \text{ m}^3$
gill (Imperial); Noggin	gill (Imperial); Noggin	gi (Imp); nog	$\equiv 5 \text{ fl oz (Imp)}$	$= 142.065\,3125 \times 10^{-6} \text{ m}^3$
gill (U.S.)	gill (SUA)	gi (US)	$\equiv 4 \text{ US fl oz}$	$= 118.294\,118\,25 \times 10^{-6} \text{ m}^3$
hogshead (Imperial)	hogshead (Imperial)	hhd (Imp)	$\equiv 2 \text{ bl (Imp)}$	$= 0.327\,318\,48 \text{ m}^3$
hogshead (U.S.)	hogshead (SUA)	hhd (US)	$\equiv 2 \text{ fl bl (US)}$	$= 0.238\,480\,942\,392 \text{ m}^3$
jigger (bartending)	jigger (bartending)		$\equiv \frac{1}{2} \text{ US fl oz}$	$\approx 44.36 \times 10^{-6} \text{ m}^3$
kilderkin	kilderkin		$\equiv 18 \text{ gal (Imp)} ; = \frac{1}{2} \text{ barrel}$	$= 0.081\,829\,62 \text{ m}^3$
lambda	lambda	λ	$\equiv 1 \text{ mm}^3$	$= 1 \times 10^{-9} \text{ m}^3$
last	last		$\equiv 80 \text{ bu (Imp)}$	$= 2.909\,4976 \text{ m}^3$
litre	litru	L	$\equiv 1 \text{ dm}^3$	$\equiv 0.001 \text{ m}^3$
load	load		$\equiv 50 \text{ cu ft}$	$= 1.415\,842\,3296 \text{ m}^3$
minim (Imperial)	minim (Imperial)	min	$\equiv 1/480 \text{ fl oz (Imp)} = 1/60 \text{ fl dr (Imp)}$	$= 59.193\,880\,208\,3 \times 10^{-9} \text{ m}^3$
minim (U.S.)	minim (SUA)	min	$\equiv 1/480 \text{ US fl oz} = 1/60 \text{ US fl dr}$	$= 61.611\,519\,921\,875 \times 10^{-9} \text{ m}^3$
ounce (fluid Imperial)	uncie (lichid Imperial)	fl oz (Imp)	$\equiv 1/160 \text{ gal (Imp)}$	$\equiv 28.413\,0625 \times 10^{-6} \text{ m}^3$
ounce (fluid U.S. customary)	uncie (lichide uzuale SUA)	US fl oz	$\equiv 1/128 \text{ gal (US)}$	$\equiv 29.573\,529\,5625 \times 10^{-6} \text{ m}^3$
ounce (fluid U.S. food nutrition labeling)	uncie (lichid SUA etichete alimente)	US fl oz	$\equiv 30 \text{ mL}$	$\equiv 3 \times 10^{-5} \text{ m}^3$
peck (Imperial)	peck (Imperial)	pk	$\equiv 2 \text{ gal (Imp)} ; 9.092 \text{ litres}$	$= 9.092\,18 \times 10^{-3} \text{ m}^3$
peck (U.S. dry)	peck (SUA uscate)	pk	$\equiv \frac{1}{4} \text{ US lvi bu} ; 8.81 \text{ litres}$	$= 8.809\,767\,541\,72 \times 10^{-3} \text{ m}^3$
perch	perch	per	$\equiv 16\frac{1}{2} \text{ ft} \times 1\frac{1}{2} \text{ ft} \times 1 \text{ ft}$	$= 0.700\,841\,953\,152 \text{ m}^3$
pinch (Imperial)	pinch (Imperial)		$\equiv 1/192 \text{ gi (Imp)} = \frac{1}{8} \text{ tsp (Imp)}$	$= 739.923\,502\,60416 \times 10^{-9} \text{ m}^3$
pinch (U.S.)	pinch (SUA)		$\equiv 1/48 \text{ US fl oz} = \frac{1}{8} \text{ US tsp}$	$= 616.115\,199\,218\,75 \times 10^{-9} \text{ m}^3$
pint (Imperial)	pint (Imperial)	pt (Imp)	$\equiv \frac{1}{8} \text{ gal (Imp)}$	$= 568.261\,25 \times 10^{-6} \text{ m}^3$

<i>pint (U.S. dry)</i>	pint (SUA uscate)	pt (US dry)	≡ 1/64 bu (US lvl) ≡ 1/8 gal (US dry)	= 550.610 471 3575×10 ⁻⁶ m ³
<i>pint (U.S. fluid)</i>	pint (SUA lichide)	pt (US fl)	≡ 1/8 gal (US)	= 473.176 473×10 ⁻⁶ m ³
<i>pony</i>	pony		≡ 3/4 US fl oz	= 22.180 147 171 875×10 ⁻⁶ m ³
<i>pottle; quatern</i>	pottle; quatern		≡ 1/2 gal (Imp) = 80 fl oz (Imp)	= 2.273 045×10 ⁻³ m ³
quart (Imperial)	sfert (Imperial)	qt (Imp)	≡ 1/4 gal (Imp)	= 1.136 5225×10⁻³ m³
<i>quart (U.S. dry)</i>	sfert (SUA uscate)	qt (US)	≡ 1/32 bu (US lvl) = 1/4 gal (US dry)	= 1.101 220 942 715×10 ⁻³ m ³
<i>quart (U.S. fluid)</i>	sfert (SUA lichide)	qt (US)	≡ 1/4 gal (US fl)	= 946.352 946×10 ⁻⁶ m ³
quarter	cvarter		≡ 8 bu (Imp)	= 0.290 949 76 m³
register ton	tona registru		≡ 100 cu ft	= 2.831 684 6592 m³
<i>sack (Imperial); bag</i>	sack (Imperial); bag		≡ 3 bu (Imp)	= 0.109 106 16 m ³
<i>sack (U.S.)</i>	sack (SUA)		≡ 3 bu (US lvl)	= 0.105 717 210 500 64 m ³
<i>seam</i>	seam		≡ 8 bu (US lvl)	= 0.281 912 561 335 04 m ³
<i>shot</i>	shot		≡ 1 US fl oz	≈ 29.57×10 ⁻⁶ m ³
<i>strike (Imperial)</i>	strike (Imperial)		≡ 2 bu (Imp)	= 0.072 737 44 m ³
<i>strike (U.S.)</i>	strike (SUA)		≡ 2 bu (US lvl)	= 0.070 478 140 333 76 m ³
<i>tablespoon (Australian metric)</i>	tablespoon (Australian metric)			≡ 20.0×10 ⁻⁶ m ³
<i>tablespoon (Canadian)</i>	tablespoon (Canadian)	tbsp	≡ 1/2 fl oz (Imp)	= 14.206 531 25×10 ⁻⁶ m ³
<i>tablespoon (Imperial)</i>	tablespoon (Imperial)	tbsp	≡ 5/8 fl oz (Imp)	= 17.758 164 0625×10 ⁻⁶ m ³
<i>tablespoon (metric)</i>	tablespoon (metric)			≡ 15.0×10 ⁻⁶ m ³
<i>tablespoon (U.S. customary)</i>	tablespoon (SUA obisnuit)	tbsp	≡ 1/2 US fl oz	= 14.786 764 7825×10 ⁻⁶ m ³
<i>tablespoon (U.S. food nutrition labeling)</i>	tablespoon (S.U.A. etichete alimente)	tbsp	≡ 15 mL	= 1.5×10 ⁻⁵ m ³
<i>timber foot</i>	picior de cherestea		≡ 1 cu ft	= 0.028 316 846 592 m ³
<i>ton (displacement)</i>	tona (deplasare)		≡ 35 cu ft	= 0.991 089 630 72 m ³
<i>ton (freight)</i>	tona (marfa)		≡ 40 cu ft	= 1.132 673 863 68 m ³
<i>ton (water)</i>	tona (apa)		≡ 28 bu (Imp)	= 1.018 324 16 m ³
<i>wey (U.S.)</i>	wey (SUA)		≡ 40 bu (US lvl)	= 1.409 562 806 6752 m ³

tabel D 2.3.2. table D 2.3.2.

TABEL DE ECHIVALENTA PENTRU UNITATI DE VOLUM SI CAPACITATE EQUIVALENCE TABLE FOR VOLUME AND CAPACITY UNITS													
=	decimetru ³ decimeter ³	metru ³ meter ³	țol ³ inch ³	picioare ³ feet ³	yard ³ yard ³	tona registru register ton	litru liter	pint pint	sfert quart (imp)	galon gallon (imp)	galon gallon (US)	baril barrel (imp)	baril barrel (US)
	dm ³	m ³	in ³	ft ³	yd ³		l	pt(imp)	qt(imp)	gal(imp)	gal(US)	bl(imp)	bl(US)
1 dm ³	1	0.001	61.02	0.0353	0.001308	0.00035	0.999	1.7597	0.87988	0.22	0.264	0.0061	
1 m ³	1000	1	61023	35.31	1.308	0.3531				220	264.2	6.1111	6.2898
1 in ³	0.0164	1.64×10 ⁻⁵	1	0.000578									
1 ft ³	28.316	0.028316	1728	1	0.037	0.01	28.316	49.831	24.915	6.232	7.481	0.1731	0.1781
1 yd ³	764.555	0.764555	46656	27	1	0.27				168.177	201.974	4.6716	4.8089
1 register ton	2831.685	2.831685		100		1							
1 l	1.000028			0.0353		0.00035	1	1.7598	0.8799	0.2199		0.0061	
1 pt	0.56826	0.568×10 ⁻³		0.02007		0.0002	0.568	1	0.5	0.125		0.0035	
1 qt (imp)	1.13652	1.136×10 ⁻³		0.04013		0.0004	1.136	2	1	0.25		0.0069	
1 gal (imp)	4.546	0.004546	277.42	0.1605		0.0016	4.546	8	4	1	1.201	0.0278	0.0286
1 gal (US)	3.785	0.003785	231	0.1337		0.00133	3.785			0.8327	1	0.0231	0.0238
1 bl (imp)	163.659	0.163659		5.777		0.05777	163.64					1	1.02934
1 bl (US)	158.987	0.158987	9702	5.615	0.2079	0.05615	158.98			34.9726	42	0.9715	1

2.4. Unitati de masa Mass Units

tabel D 2.4.1. table D 2.4.1.

UNIT NAME	NUMELE UNITATII	SIMBOL SYMBOL	DEFINITIE DEFINITION	CORESPONDENTA CU S.I. RELATION TO S.I. UNITS
<i>barge</i>	barja		≡ 22½ sh tn	= 20 411.656 65 kg
<i>carat</i>	carat	kt	≡ 3 1/6 gr	≈ 205.196 548 333 mg
<i>carat (metric)</i>	carat (metric)	ct	≡ 200 mg	= 200 mg
<i>clove</i>	clova		≡ 8 lb av	= 3.628 738 96 kg
<i>crith</i>	crith			≈ 89.9349 mg
<i>dalton</i>	dalton	Da		≈ 1.660 902 10×10 ⁻²⁷ ± 1.3×10 ⁻³⁶ kg
<i>dram (apothecary; troy)</i>	drahma (farmacie)	dr t (3)	≡ 60 gr	= 3.887 9346 g
dram (avoirdupois)*	drahma (avoirdupois)*	dr av	≡ 27 11/32 gr	= 1.771 845 195 3125 g
<i>gamma</i>	gamma	γ	≡ 1 μg	= 1 μg
<i>grain</i>	grain	gr	≡ 1/7000 lb av	≡ 64.798 91 mg
<i>grave</i>	grave	G	grave was the original name of the kilogram	≡ 1 kg
hundredweight (long)	chintal englezesc hundredweight (lung)	long cwt or cwt	≡ 112 pound (lb av)	= 50.802 345 44 kg

<i>hundredweight (short); cental US</i>	chintal SUA hundredweight (scurt)	sh cwt	≡ 100 lb av	= 45.359 237 kg
<i>hyl (CGS unit)</i>	hyl (sistem CGS)		≡ 1 gee × 1 g × 1 s ² /m	= 9.806 65 g
<i>hyl (MKS unit)</i>	hyl (sistem MKS)		≡ 1 gee × 1 kg × 1 s ² /m	= 9.806 65 kg
kilogram	kilogram	kg	≡ mass of the prototype near Paris (≈ mass of 1L of water)	≡ 1 kg (SI base unit)
<i>kip</i>	kip	kip	≡ 1000 lb av	= 453.592 37 kg
<i>mark</i>	mark		≡ 8 oz t	= 248.827 8144 g
<i>mite</i>	mite		≡ 1/20 gr	= 3.239 9455 mg
<i>mite (metric)</i>	mite (metric)		≡ 1/20 g	= 50 mg
<i>ounce (U.S. food nutrition labeling)</i>	uncie (S.U.A. etichete alimente)	oz	≡ 28 g	= 28 g
<i>ounce (apothecary; troy)</i>	uncie (farmacie)	oz t	≡ 1/12 lb t	= 31.103 4768 g
<i>ounce (avoirdupois)*</i>	uncie (avoirdupois)*	oz av	≡ 1/16 lb	= 28.349 523 125 g
<i>pennyweight</i>	pennyweight	dwt; pwt	≡ 1/20 oz t	= 1.555 173 84 g
<i>point</i>	point		≡ 1/100 ct	= 2 mg
pound (libre)(av)	pfund (libre) (av)	lb av	≡ 0.453 592 37 kg = 7000 grains	≡ 0.453 592 37 kg
<i>pound (metric)</i>	pfund (libre) (metric)		≡ 500 g	= 500 g
<i>pound (troy)</i>	pfund (libre) (troy)	lb t	≡ 5 760 grains	= 0.373 241 7216 kg
<i>quarter (Imperial)</i>	quarter (Imperial)		≡ 1/4 long cwt = 2st = 28 lb av	= 12.700 586 36 kg
<i>quarter (informal)</i>	quarter (informal)		≡ ¼ short tn	= 226.796 185 kg
<i>quarter, long (informal)</i>	quarter, long (informal)		≡ ¼ long tn	= 254.011 7272 kg
<i>quintal (metric)</i>	chintal (metric)	q	≡ 100 kg	= 100 kg
<i>scruple (apothecary)</i>	scruple (farmacie)	s ap	≡ 20 gr	= 1.295 9782 g
<i>sheet</i>	sheet		≡ 1/700 lb av	= 647.9891 mg
<i>slug; geepound</i>	slug; geepound	slug	≡ 1 gee×1 lb av × 1 s ² /ft	≈ 14.593 903 kg
<i>stone</i>	piatra	st	≡ 14 lb av	= 6.350 293 18 kg
<i>ton, long</i>	tona, lunga	long tn or ton	≡ 2 240 lb	= 1 016.046 9088 kg
<i>ton, short</i>	tona, scurta	sh tn	≡ 2 000 lb	= 907.184 74 kg
tonne (MTS unit)	tonne (sistem MTS)	t	≡ 1 000 kg	= 1 000 kg
<i>wey</i>	wey		≡ 252 lb = 18 st	= 114.305 277 24 kg (variants exist)

* „avoirdupois” (prescurtat **av**) - este un sistem de greutate (sau masa), care are la baza uncia ca fiind a saispzeceea parte dintr-o libra. Acesta este sistemul uzual de greutate folosite in Statele Unite, si este inca utilizat pe scara larga in diferite grade in Canada, Marea Britanie, si a unor colonii de alti fosti britanice in ciuda adoptarii oficiale a sistemului metric. De asemenea, este frecvent utilizat pentru metale, cum ar fi aurul si argintul.

„avoirdupois” (abbreviation **av**) - is a system of weights (or, properly, mass) based on a pound of sixteen ounces. It is the everyday system of weight used in the United States, and is still widely used to varying degrees by many people in Canada, the United Kingdom, and some other former British colonies despite the official adoption of the metric system. It is also commonly used for metals, such as gold and silver.

2.5. Unitati de densitate Density Units

tabel D 2.5.1. table D 2.5.1.

NAME OF UNIT	NUMELE UNITATII	SIMBOL SYMBOL	DEFINITIE DEFINITION	CORESPONDENTA CU S.I. RELATION TO S.I. UNITS
<i>gram per millilitre</i>	gram pe milililitru	g/mL	≡ g/mL	= 1,000 kg/m ³
<i>kilogram per cubic metre (SI unit)</i>	kilogram pe metru cub (in SI)	kg/m³	≡ kg/m ³	= 1 kg/m ³
<i>kilogram per litre</i>	kilogram pe litru	kg/L	≡ kg/L	= 1,000 kg/m ³
<i>ounce (avoirdupois) per cubic foot</i>	uncie (avoirdupois) pe picior la cub	oz/ft³	≡ oz/ft ³	≈ 1.001153961 kg/m ³
<i>ounce (avoirdupois) per cubic inch</i>	uncie (avoirdupois) pe inch la cub	oz/in³	≡ oz/in ³	≈ 1.729994044×10 ³ kg/m ³
<i>ounce (avoirdupois) per gallon (Imperial)</i>	uncie (avoirdupois) pe galon (Imperial) la cub	oz/gal	≡ oz/gal	≈ 6.236023291 kg/m ³
<i>ounce (avoirdupois) per gallon (U.S. fluid)</i>	uncie (avoirdupois) pe galon (lichude SUA) la cub	oz/gal	≡ oz/gal	≈ 7.489151707 kg/m ³
<i>pound (avoirdupois) per cubic foot</i>	Libra (avoirdupois) pe picior la cub	lb/ft³	≡ lb/ft ³	≈ 16.01846337 kg/m ³
<i>pound (avoirdupois) per cubic inch</i>	Libra (avoirdupois) pe inch la cub	lb/in³	≡ lb/in ³	≈ 2.767990471×10 ⁴ kg/m ³
<i>pound (avoirdupois) per gallon (Imperial)</i>	Libra (avoirdupois) pe galon (Imperial)	lb/gal	≡ lb/gal	≈ 99.77637266 kg/m ³
<i>pound (avoirdupois) per gallon (U.S. fluid)</i>	Libra (avoirdupois) pe gallon (lichid U.S.)	lb/gal	≡ lb/gal	≈ 119.8264273 kg/m ³
<i>slug per cubic foot*</i>	slug pe picior la cub*	slug/ft³	≡ slug/ft ³	≈ 515.3788184 kg/m ³

* Slug-ul este masa unui corp care sub actiunea unei forte de 1 libra-fora (pound-force) primeste o acceleratie de 1ft/sec². 1 slug=32.17405 libre-masa sau 14.5939 kg.

Slug is a mass that accelerates by 1 ft/sec² when a force of one pound-force (lbf) is exerted on it. Therefore a slug has a mass of 32.17405 pound-mass or 14.5939 kg.

2.6. Unitati de presiune Pressure Units

tabel D 2.6.1. table D 2.6.1.

NAME OF UNIT	NUMELE UNITATII	SIMBOL SYMBOL	DEFINITIE DEFINITION	CORESPONDENTA CU S.I. RELATION TO S.I. UNITS
atmosphere (standard)	atmosfera (standard)	atm		$\equiv 101\,325\text{ Pa}$
<i>atmosphere (technical)</i>	atmosfera (tehnica)	at	$\equiv 1\text{ kgf/cm}^2$	$\approx 9.806\,65 \times 10^4\text{ Pa}$
bar	bar	bar		$\equiv 10^5\text{ Pa}$
<i>barye (cgs unit)</i>	barye (in sistem CGS)		$\equiv 1\text{ dyn/cm}^2$	$= 0.1\text{ Pa}$
<i>centimetre of mercury</i>	centimetru coloana de mercur	cmHg	$\equiv 13\,595.1\text{ kg/m}^3 \times 1\text{ cm} \times \text{g}$	$\approx 1.333\,22 \times 10^3\text{ Pa}$
<i>centimetre of water (4 °C)</i>	centimetru coloana de apa (4 °C)	cmH₂O	$\approx 999.972\text{ kg/m}^3 \times 1\text{ cm} \times \text{g}$	$\approx 98.0638\text{ Pa}$
<i>foot of mercury (conventional)</i>	picioar coloana de mercur (conventional)	ftHg	$\equiv 13\,595.1\text{ kg/m}^3 \times 1\text{ ft} \times \text{g}$	$\approx 40.636\,66 \times 10^3\text{ Pa}$
<i>foot of water (39.2 °F)</i>	picioar coloana de apa (39.2 °F)	ftH₂O	$\approx 999.972\text{ kg/m}^3 \times 1\text{ ft} \times \text{g}$	$\approx 2.988\,98 \times 10^3\text{ Pa}$
<i>inch of mercury (conventional)</i>	inch coloana de mercur (conventional)	inHg	$\equiv 13\,595.1\text{ kg/m}^3 \times 1\text{ in} \times \text{g}$	$\approx 3.386\,389 \times 10^3\text{ Pa}$
<i>inch of water (39.2 °F)</i>	inch coloana de apa (39.2 °F)	inH₂O	$\approx 999.972\text{ kg/m}^3 \times 1\text{ in} \times \text{g}$	$\approx 249.082\text{ Pa}$
<i>kilogram-force per square millimetre</i>	kilogram-fora pe milimetru patrat	kgf/mm²	$\equiv 1\text{ kgf/mm}^2$	$= 9.806\,65 \times 10^6\text{ Pa}$
<i>kip per square inch</i>	kip pe inch la patrat	ksi	$\equiv 1\text{ kipf/sq in}$	$\approx 6.894\,757 \times 10^6\text{ Pa}$
millimetre of mercury	millimetru coloana de mercur	mmHg	$\equiv 13\,595.1\text{ kg/m}^3 \times 1\text{ mm} \times \text{g} \approx 1\text{ torr}$	$\approx 133.3224\text{ Pa}$
<i>millimetre of water (3.98 °C)</i>	millimetru coloana de apa (3.98 °C)	mmH₂O	$\approx 999.972\text{ kg/m}^3 \times 1\text{ mm} \times \text{g} = 0.999\,972\text{ kgf/m}^2$	$= 9.806\,38\text{ Pa}$
pascal (SI unit)	pascal (in SI)	Pa	$\equiv \text{N/m}^2 = \text{kg/(m}\cdot\text{s}^2)$	$= 1\text{ Pa}$
<i>pièze (MTS unit)</i>	pièze (in sistem MTS)	pz	$\equiv 1\,000\text{ kg/m}\cdot\text{s}^2$	$= 1 \times 10^3\text{ Pa} = 1\text{ kPa}$
<i>pound per square foot</i>	Pfund pe picior la patrat	psf	$\equiv 1\text{ lbf/ft}^2$	$\approx 47.880\,26\text{ Pa}$
pound per square inch	Pfund pe inch (țol) la patrat	psi	$\equiv 1\text{ lbf/in}^2$	$\approx 6.894\,757 \times 10^3\text{ Pa}$
<i>poundal per square foot*</i>	Pfundal pe picior la patrat*	pdl/sq ft	$\equiv 1\text{ pdl/sq ft}$	$\approx 1.488\,164\text{ Pa}$
<i>short ton per square foot</i>	tona scurta pe picior la patrat		$\equiv 1\text{ sh tn} \times \text{g} / 1\text{ sq ft}$	$\approx 95.760\,518 \times 10^3\text{ Pa}$
torr	torr	torr	$\equiv 101\,325/760\text{ Pa}$	$\approx 133.3224\text{ Pa}$

* poundalul (pdl) este forta care imprima masei de 1 lb o acceleratie de 1 ft/s². 1 pdl=0.138255N
poundal (pdl) is the force that give at 1 lb mass 1 lb ft/s² acceleration. 1 pdl = 0.138255N

tabel D 2.6.2. table D 2.6.2.

TABEL DE ECHIVALENTA PENTRU UNITATI DE PRESIUNE		EQUIVALENCE TABLE FOR PRESSURE UNITS				
	pascal pascal (Pa)	bar bar (bar)	atmosfera tehnica technical atmosphere (at)	atmosfera atmosphere (atm)	torr torr (Torr)	pfund-fora pe țol la patrat pound-force per square inch (psi)
1 Pa =	1 N/m ²	10 ⁻⁵	1.0197×10 ⁻⁵	9.8692×10 ⁻⁶	7.5006×10 ⁻³	145.04×10 ⁻⁶
1 bar =	100,000	10 ⁶ dyn/cm ²	1.0197	0.98692	750.06	14.5037744
1 at =	98,066.5	0.980665	1 kgf/cm ²	0.96784	735.56	14.223
1 atm =	101,325	1.01325	1.0332	1 atm	760	14.696
1 torr =	133.322	1.3332×10 ⁻³	1.3595×10 ⁻³	1.3158×10 ⁻³	1 Torr ≈ 1 mmHg	19.337×10 ⁻³
1 psi =	6.894×10 ³	68.948×10 ⁻³	70.307×10 ⁻³	68.046×10 ⁻³	51.715	1 lbf/in ²

2.7. Unitati de temperatura Temperature Units

tabel D 2.7.1. table D 2.7.1.

NAME OF UNIT	NUMELE UNITATII	SIMBOL SYMBOL	DEFINITIE DEFINITION	CORESPONDENTA CU S.I. RELATION TO S.I. UNITS
<i>degree Celsius</i>	grad Celsius	°C	$^{\circ}\text{C} \equiv \text{K} - 273.15$	$[\text{K}] \equiv [^{\circ}\text{C}] + 273.15$
<i>degree Delisle</i>	grad Delisle	°De		$[\text{K}] = 373.15 - [^{\circ}\text{De}] \times 2/3$
<i>degree Fahrenheit</i>	grad Fahrenheit	°F	$^{\circ}\text{F} \equiv ^{\circ}\text{C} \times 9/5 + 32$	$[\text{K}] \equiv [(^{\circ}\text{F}) + 459.67] \times 5/9$
<i>degree Newton</i>	grad Newton	°N		$[\text{K}] = [^{\circ}\text{N}] \times 100/33 + 273.15$
<i>degree Rankine</i>	grad Rankine	°R; °Ra	$^{\circ}\text{R} \equiv \text{K} \times 9/5$	$[\text{K}] \equiv [^{\circ}\text{R}] \times 5/9$
<i>degree Réaumur</i>	grad Réaumur	°Ré		$[\text{K}] = [^{\circ}\text{Ré}] \times 5/4 + 273.15$
<i>degree Rømer</i>	grad Rømer	°Rø		$[\text{K}] = [(^{\circ}\text{Rø}) - 7.5] \times 40/21 + 273.15$
<i>Kelvin (SI base unit)</i>	Kelvin (In SI de unitati)	K	$\equiv 1/273.16$ din temperatura punctului triplu al apei (0°C). $\equiv 1/273.16$ of the thermodynamic temperature of the triple point of water (0°C).	$\equiv 1\text{ K}$



STANDARDE STANDARDS

DIN	DEUTSCHE INDUSTRIAL NORM
EN	EUROPEAN NORM
ISO	INTERNATIONAL STANDARD ORGANIZATION
MSS	MANUFACTURERS STANDARDIZATION SOCIETY
NACE	NATIONAL ASSOCIATION OF CORROSION ENGINEERS
KGSC	KOREA GAS SAFETY CORPORATION SPECIFICATIONS
KDHC	KOREA DISTRICT HEATING CORPORATION
KEMCO	KOREA ENERGY MANAGEMENT CORPORATION
BS	BRITISH STANDARD
UNS	UNIFIED NUMBERING SYSTEMS
SS	SWEDISH STANDARD
AFNOR	ASSOCIATION FRANCAISE DE NORMALISATION
AISI	AMERICAN IRON AND STEEL INSTITUTE
ASME	AMERICAN SOCIETY OF MATERIALS ENGINEERS
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ANSI	AMERICAN NATIONAL STANDARD INSTITUTE
API	AMERICAN PETROLEUM INSTITUTE

