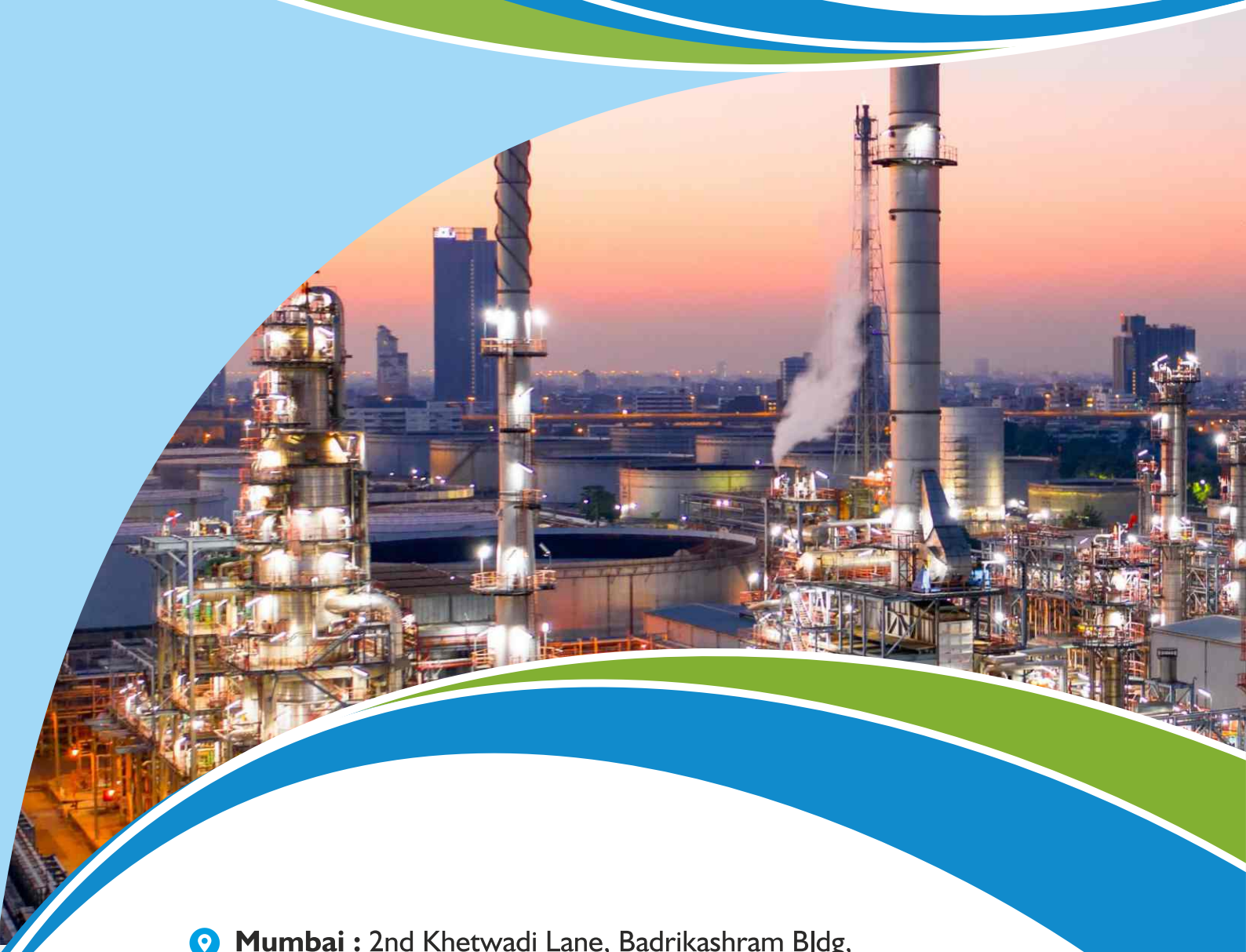
Chitransh STEEL CO.

(AN ISO 9001:2015 CERTIFIES COMPANY)

MFGR & STOCKIST OF SS/CS : Fittings/Flanges/ Fastener/ Hex/ Square/ Angle/ Patta-Patti etc.



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ALLOY STEELS

COMMON DESCRIPTION	ASTM SPECIFICATION					UNS	CHEMICAL ANALYSIS NOMINAL								Nominal Mechanical Properties		
	PLATE	PIPE	FITTINGS	FLANGES/ FORGINGS	TUBES	DESIGN GRADE	C ≤	SI ≤	Mo ≤	Cr	Mo	Ni	Cu	Others	Tensile min MPa	yield point 0.2% min MPa	Elongation in 2 or 4D min %
3¼% Ni	A203	A333	A420	A350	A334	-	0.19	0.18-0.37	0.31-0.64	-	-	3.18-3.82	–	–	450	240	30
1 Cr - ½Mo	A387	A335	A234	A182	A213	12	0.15	≤0.50	0.3-0.61	0.8-1.25	0.44-0.65	-	-	-	415	205	30
1 ¼CR- ½Mo	A387	A335	A234	A182	A213	11	0.15	0.5-1.0	0.3-0.6	1.0-1.5	0.44-0.65	-	-	-	415	205	30
2¼Cr-1Mo	A387	A335	A234	A182	A213	22	0.15	≤0.50	0.3-0.6	1.9-2.6	0.87-1.13	-	-	-	415	205	30
5Cr-½Mo	A387	A335	A234	A182	A213	5	0.15	≤0.50	0.3-0.6	4.0-6.0	0.45-0.65	-	-	-	415	205	30
9Cr-1Mo	A387	A335	A234	A182	A213	9	0.15	0.25-1.0	0.3-0.6	8.0-10.0	0.9-1.1	-	-	-	415	205	30

NICKEL ALLOY

COMMON DESCRIPTION	ASTM SPECIFICATION					UNS	CHEMICAL ANALYSIS NOMINAL								Nominal Mechanical Properties		
	PLATE	PIPE	FITTINGS	FLANGES/ FORGINGS	TUBES	DESIGN GRADE	C ≤	SI ≤	Mo ≤	Cr	Mo	Ni	Cu	Others	Tensile min MPa	yield point 0.2% min MPa	Elongation in 2 or 4D min %
Nickel 200	B162	B161/8725	B366	B160	B161/B163	N02200	0.15	0.35	0.35	-	- -	99.0min	0.25	Fe 0.40	380-550	80-415	10-40
Monel 400	B127	B165	B366	B164/B564	B163/B165	N04400	0.3	0.50	2.00	-	- -	63.0min	28.34	Fe 2.50 max S 0.024	485-690	195-620	2-35
Monel 500	-	-	-	-	-	N05500	0.25	0.05	1.50	-	- -	63.0-7.00	bal	Al 2.5-3.5, Fe 2.0 max S 0.01 max, Ti 0.35-0.85	880	590	15
Inconel 600	B168	B167/B517	B366	B166/B564	B167/B516	N05800	0.15	0.05	1.00	14.0-17.0	- -	72.0min	0.50	Fe 5.0-10.0 S 0.015max	515-825	170-825	7-35
Inconel 601	-	-	-	-	-	N05601	0.10	0.05	1.00	21.0-25.0	- -	58.0-63.0	1.00	al 1.0-1.7 Fe rem	600	240	30
Incoloy 800H	B409	B407/515	B366	B408/B564	B163/B407/ B515	N08810	0.05-0.1	1.00	1.50	19.0-23.0	-	30.0-35.0	0.75	Al 0.15-0.6, ti 0.15-0.6 Fe 39.5 min, S0.015 max	450	170	30
Incoloy 825	B424	B423/B705	B366	B425/B564	B163/B704	N08825	0.05	0.50	1.00	19.5-23.5	-	38.0-46.0	1.5-3	Al 02 max, Ti 0.6-1.2 Fe 22.0 min, S.0.03 max	586	241	30
Hastolloy C276	B575	B619/B822	B366	B574	B622/B626	N10276	0.01	0.08	1.00	14.5-16.5	15.0-17.0	rem	-	Fe 4.0-7.0 W3.0-4.5 Co2.5 max, V 0.35 max	690	283	40
hastelloy B2	B333	B619/B622	B366	B335	B622/B626	N10665	0.02	0.10	1.00	1.0 max	26.0-30.0	rem	-	Fe 2.0 max, Co 1.0 max	760	352	40
904L	B625	B577/B673	B366	B649	B677	N08904	0.02	1.00	2.00	19.0-23.0	4.0-5.0	23.0-28.0	1.0-2.0		490	220	35

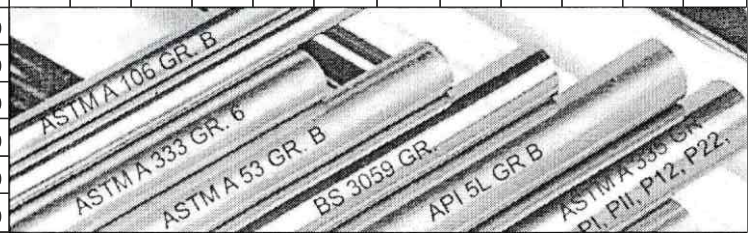
WEIGHT & THICKNESS OF CARBON STEEL SEAMLESS PIPE

ASTM PIPE SCHEDULES

Wall=Wall Thickness in Millimeter

Wt. = Weight In Kilogram Per Meter

NOMINAL PIPE SIZE		OD MM	SCHEDULE 10		SCHEDULE 20		SCHEDULE 30		SCHEDULE STD		SCHEDULE 40		SCHEDULE 60		SCHEDULE EXTRA A STRONG(XS)		SCHEDULE 80		SCHEDULE 100		SCHEDULE 120		SCHEDULE 140		SCHEDULE 160		SCHEDULE DOUBLE EXTRA STRONG	
mm	inch		W/T	Weight	W/T	Weight	W/T	Weight	W/T	Weight	W/T	Weight	W/T	Weight	W/T	Weight	W/T	Weight	W/T	Weight	W/T	Weight	W/T	Weight	W/T	Weight	W/T	Weight
3	1/8	10.3	-	-	-	-	-	-	1.73	0.37	1.73	0.357	-	-	2.41	0.470	2.41	0.470	-	-	-	-	-	-	-	-	-	-
6	1/4	13.7	-	-	-	-	-	-	2.2	0.63	2.24	0.625	-	-	3.02	0.804	3.02	0.804	-	-	-	-	-	-	-	-	-	-
10	3/8	17.1	-	-	-	-	-	-	2.31	0.848	2.31	0.848	-	-	3.20	1.10	3.20	1.10	-	-	-	-	-	-	-	-	-	-
15	1/2	21.3	-	-	-	-	-	-	2.77	1.26	2.77	1.26	-	-	3.73	1.62	3.73	1.62	-	-	-	-	-	-	4.8	1.95	7.5	2.55
20	3/4	26.7	-	-	-	-	-	-	2.87	1.69	2.87	1.68	-	-	3.91	2.20	3.91	2.20	-	-	-	-	-	-	5.6	2.90	7.82	3.64
25	1	33.4	-	-	-	-	-	-	3.38	2.50	3.38	2.50	-	-	4.55	3.24	4.55	3.24	-	-	-	-	-	-	6.4	4.24	9.1	5.45
32	1¼	42.2	-	-	-	-	-	-	3.56	3.39	3.56	3.38			4.85	4.47	4.85	4.47	-	-	-	-	-	-	6.4	5.61	9.7	7.77
40	1½	48.3	-	-	-	-	-	-	3.68	4.05	3.68	4.05	-	-	5.08	5.41	5.08	5.41	-	-	-	-	-	-	7.14	7.25	10.2	9.56
50	2	60.3	-	-	-	-	-	-	3.9	5.44	3.9	5.44	-	-	5.50	7.48	5.50	7.48	-	-	-	-	-	-	8.70	11.11	11.10	13.4
65	2½	73.0	-	-	-	-	-	-	5.20	8.63	5.16	8.63	-	-	7.00	11.41	7.00	11.41	-	-	-	-	-	-	9.50	14.92	14.00	20.40
80	3	88.9	-	-	-	-	-	-	5.50	11.30	5.50	11.30	-	-	7.62	15.30	7.60	15.30	-	-	-	-	-	-	11.10	21.30	15.20	27.70
90	3½	101.6	-	-	-	-	-	-	5.74	13.57	5.74	13.57	-	-	8.08	18.63	8.08	18.63	-	-	-	-	-	-	-	-	16.2	34.10
100	4	114.3	-	-	-	-	-	-	6.02	16.07	6.02	16.07	-	-	8.56	22.3	8.56	22.30	-	-	11.1	28.3	-	-	13.5	33.50	17.12	41.03
125	5	141.3	-	-	-	-	-	-	6.60	21.77	6.55	21.77	-	-	9.53	30.90	9.53	30.90	-	-	12.7	40.20	-	-	15.90	49.00	19.00	57.40
150	6	168.3	-	-	-	-	-	-	7.11	28.26	7.11	28.26	-	-	10.97	42.50	10.90	42.50	-	-	14.30	54.20	-	-	18.3	67.50	21.95	79.22
200	8	219.1	-	-	6.35	33.3	7.0	36.8	8.2	42.5	8.2	42.5	10.3	53.1	12.7	64.6	12.7	64.5	15.1	75.8	18.3	90.4	20.6	100.9	23.0	112.0	22.23	108.0
250	10	273.0	-	-	6.35	41.7	7.8	51.3	9.27	60.3	9.27	60.3	12.7	81.5	12.7	81.5	15.1	96.0	18.3	115.0	21.44	133.0	25.4	155.0	28.60	172.0	25.40	155.0
300	12	323.8	-	-	6.35	49.7	8.4	65.2	9.53	73.8	10.3	79.7	14.3	109.0	12.7	97.4	17.4	132.0	21.4	160.0	25.4	187.0	28.6	208.0	33.3.	239.0	25.4	187.0
350	14	355.6	6.35	54.6	7.92	68.1	9.53	81.3	9.53	81.3	11.13	94.3	15.1	126.4	12.7	107.0	19.0	158.0	23.8	195.0	27.8	224.0	31.8	253.5	36.7	281.0	-	-
400	16	406.4	6.35	62.6	7.92	77.9	9.5	93.3	9.53	93.3	12.7	123.0	16.7	160.0	12.7	123.0	21.44	203.0	26.2	245.0	30.9	286.0	36.53	333.0	40.5	365.0	-	-
450	18	457.2	6.35	70.5	7.92	87.8	11.1	122.0	9.53	105.0	14.3	156.0	19.0	206.0	12.7	130.0	23.8	254.0	29.4	310.0	34.9	363.0	39.7	408.3	45.2	459.0	-	-
500	20	508.0	6.35	78.5	9.53	117.0	12.7	155.1	9.53	117.2	15.1	183.0	20.6	248.0	12.7	155.1	26.2	311.0	32.5	381.1	38.1	441.0	44.4	508	50.0	564.0	-	-
550	22	558.8	6.35	86.4	9.53	129.0	12.7	171.0	9.53	129.0	-	-	22.2	294.0	12.7	171.0	28.6	373.0	34.9	451.0	41.3	526.0	47.6	600	54.0	671.0	-	-
600	24	610.0	6.35	94.5	9.53	141.0	14.3	210.0	9.53	141.0	17.4	255.0	24.5	355.0	12.7	187	30.9	441.0	38.8	547.7	46.0	640.0	52.4	720	59.5	808.0	-	-
650	26	660.0	7.92	127.0	12.7	203.0	-	-	9.53	153.0	-	-	-	-	12.7	203.0												
700	28	711.2	7.92	138.9	12.7	219.0	15.9	272.0	9.53	165.0	-	-	-	-	12.7	219.0												
750	30	762.0	7.92	147.0	12.7	234.0	15.9	292.6	9.53	176.0	-	-	-	-	12.7	234.0												
800	32	812.8	7.92	157.0	12.7	250.0	15.9	312.0	9.53	188.2	-	-	-	-	12.7	250.0												
850	34	863.6	7.92	167.0	12.7	266.0	15.9	332.0	9.53	200.0	-	-	-	-	12.7	266.0												
900	36	914.4	7.92	176.6	12.7	282.4	15.9	351.0	9.53	212.0	-	-	-	-	12.7	281.0												

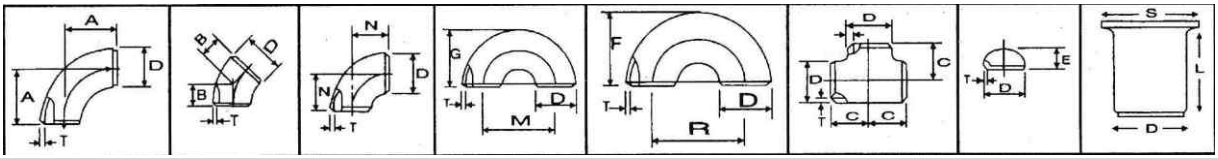


Chitransh STEEL CO.
(AN ISO 9001:2015 CERTIFIES COMPANY)

MFGR & STOCKIST OF SS/CS : Fittings/Flanges/ Fastener/ Hex/ Square/ Angle/ Patta-Patti etc.

BUTT WELDING FITTING ANSI B-16.9

ELBOWS | RETURN BENDS | LONG REDIUS | EQUAL TEES | CAPS | SHORT STUBENDS



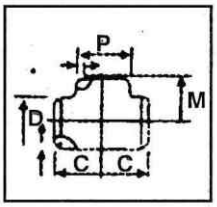
BUTT WELDING PIPE FITTING DIMENSIONAL STANDARD ANSI B-16.9, B-16.28 & MSS SP 43

Nominal Pipe Size		Outside Diameter	Center to Face				Back to Face			Center to Center			Length 'L'	
													MSSSP43	B16.9
Inch.	mm	D	A	B	C	N	E	F	G	R	M	S	L	L
1/2	15	21.3	19.05	7.94	25.4	-	25.4	47.63	-	76.2		34.93	50.8	76.2
3/4	20	26.7	28.58	14.29	28.53	-	25.4	42.86	-	57.15		42.86	50.8.	76.2
1	25	33.4	38..1	22.23	38.1	25.4	38.1	55.56	41.28	76.2	50.8	50.8	50.8	101.6
1.1/4	32	42.2	47.63	25.4	47.63	31.75	38.1	69.85	52.39	95.25	63.5	63.5	50.8	101.6
1.1/2	40	48.3	57.15	28.53	5715	38.1	38.1	82.55	61.91	114.3	76.2	73.2	50.8	101.6
2	50	60.3	76.2	34.93	63.5	50.8	38.1	106.36	80.96	152.4	101.6	92.08	63.5	152.4
2.1/2	65	73	95.25	44.45	76.2	63.5	38.1	131.76	100.01	190.5	127	104.78	63.5	152.4
3	80	88.9	114.3	50.8	85.73	76.2	50.8	158.75	120.65	228.6	152.4	127	63.5	152.4
3.1/2	90	101.6	133.35	57.15	95.25	88.9	63.5	184.15	139.7	266.7	177.8	139.7	76.2	152.4
4	100	114.3	152.4	63.5	104.78	101.6	63.5	209.55	158.75	304.8	203.2	157.16	76.2	152.4
5	125	141.3	190.5	79.37	123.83	127	76.2	261.94	196.85	381	254	185.74	76.2	203.2
6	150	168.3	228.6	95.25	142.88	152.4	88.9	312.74	236.54	457.2	304.8	215.9	88.9	203.2
8	200	219.1	304.8	127	177.8	203.2	101	414.34	312.74	609.6	406.4	269.88	101.6	203.2
10	250	273.1	381	158.7	215.9	254	127	514.53	390.53	762	508	323.85	127	254
12	300	323.9	457.2	190.5	254	304.8	152.4	619.13	466.73	914.4	609.5	381	152.4	254
14	350	355.6	533.4	222.25	279.4	355.6	165.1	711.2	533.4	1066.8	711.2	412.75	152.4	304.8
16	400	406.4	609.6	254	304.8	406.4	177.8	812.8	609.8	1219.2	812.8	469.9	152.4	304.8
18	450	457.2	685.8	285.75	342.9	457.2	203.2	914.4	685.8	1371.6	914.4	533.4	152.4	304.8
20	500	508	762	317.5	381	508	228.6	1016	762	1524	1016	584.2	152.4	304.8
22	550	559	838.2	342..9	419.1	558.8	254	1117.6	838.2	1676.4	1117	692.15	152.4	304.8
24	600	610	914.4	381	431.8	609.6	266.7	1219.2	914.4	1828.8	1219.2	692.15	152.4	304.8
26	650	660	990.6	406.4	495.3	-	266.7							
28	700	711	1066.8	438.15	520.7	-	266.7							
30	750	762	1143	469.9	588.8	-	266.7							
32	800	813	1219.2	501.65	596.9	-	266.7							
34	850	864	1295.4	533.4	635	-	266.7							
36	900	914	1371.6	565.15	673.1	-	266.7							
38	950	965	1447.8	600.08	711.2	-	304.8							
40	1000	1016	1524	631.83	749.3	-	304.8							
42	1050	1067	1600.2	660.4	762	-	304.8							
44	1100	1118	1676.4	695.33	812.8	-	342.9							
46	1150	1168	1752.6	727.09	850.9	-	342.9							
48	1200	1219	1828.8	758.83	889	-	342.9							

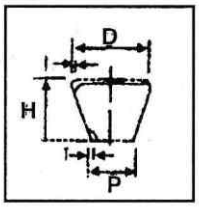
BUTT - WELDING - PIPE FITTING ANSI B- 16.9, B-16.28

Nominal Pipe Size		Outside Diameter		Center to End		Length
Inch	mm	D	P	C	M	H
1/2x3/8	15X10	21.3	17.1	25	25	-
1/2x1/4	15X8	21.3	13.7	25	25	-
3/4x1/2	20X15	33.4	21.3	29	29	38
3/4x3/8	20X10	33.4	17.1	29	29	38
1x3/4	25X20	26.7	26.7	38	38	51
1x1/2	25X15	26.7	21.3	38	38	51
1¼x1	32X25	42.2	33.4	48	48	51
1¼x3/4	32X20	42.2	26.7	48	48	51
1¼x1/2	32X15	42.2	21.3	48	48	51
1½x1¼	40X32	48.3	42.2	57	57	64
1½x1	40X25	48.3	33.4	57	57	64
1½x3/4	40X20	48.3	26.7	57	57	64
1½x1/2	40X15	48.3	21.3	57	57	64
2x1½	50X40	60.3	48.2	64	60	76
2x1¼	50X32	60.3	42.2	64	57	76
2x1	50X25	60.3	33.4	64	51	76
2x3/4	50X20	60.3	26.7	64	44	76
2½x2	65X50	73.0	60.3	76	70	89
2½x1½	65X40	73.0	48.3	76	67	89
2½x1¼	65X32	73.0	42.2	76	64	89
2½x1	65X25	73.0	33.4	76	57	89
3x2½	80X65	88.9	73.0	86	83	89
3x2	80X50	88.9	60.3	86	76	89
3x1½	80X40	88.9	48.3	86	73	89
3x1¼	80X32	88.9	42.2	86	70	89
4x3½	100X90	114.3	101.6	105	102	102
4x3	100X80	114.3	88.9	105	98	102
4x2½	100X65	114.3	73.0	105	95	102
4x2	100X50	114.3	60.3	105	89	102
4x1½	100X40	114.3	48.3	105	86	102
5x4	125X100	141.3	114.3	124	117	127
5x3½	125X90	141.3	101.6	124	114	127
5x3	125X80	141.3	88.9	124	111	127
5x2½	125X65	141.3	73.0	124	108	127
5x2	125X50	141.3	60.3	124	105	127
6x5	150X125	168.3	141.3	143	137	140
6x4	150X100	168.3	114.3	143	130	140
6x3½	150X90	168.3	101.6	143	127	140
6x3	150X80	168.3	88.9	143	124	140
6x2½	150X65	168.3	73.0	143	121	140

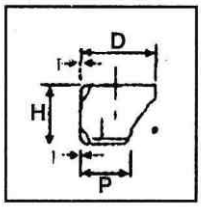
Nominal Pipe Size		Outside Diameter		Center to End		Length
Inch	mm	D	P	C	M	H
8X6	200X150	219.1	168.3	178	168	152
8X5	200X125	219.1	141.3	178	162	152
8X4	200X100	219.1	114.3	178	156	152
8X3 ½	200X90	219.1	101.6	178	152	152
10X8	250X200	273.1	219.1	216	203	178
10X6	250X150	273.1	168.1	216	194	178
10X5	250X125	273.1	141.3	216	191	178
10X4	250X100	273.1	114.3	216	184	178
12X10	300X250	323.9	273.1	254	241	203
12X8	300X200	323.9	219.1	254	229	203
12X6	300X150	323.9	168.3	254	219	203
12X5	300X125	323.9	141.3	254	216	203
14X12	350X300	355.6	323.9	279	270	330
14X10	350X250	355.6	273.1	279	257	330
14X8	350X200	355.6	219.1	279	248	330
14X6	350X150	355.6	168.3	279	238	330
16X14	400X350	406.4	355.6	305	305	356
16X12	400X300	406.4	323.9	305	295	356
16X10	400X250	406.4	273.1	305	283	356
16X8	400X200	406.4	219.1	305	273	356
16X6	400X150	406.4	168.3	305	264	-
18X16	450X400	457.0	355.6	343	330	381
18X14	450X350	457.0	323.9	343	330	381
18X12	450X300	457.0	273.1	343	321	381
18X10	450X250	457.0	219.1	343	308	381
18X8	450X200	457.0	168.3	343	298	-
20X18	500X450	508.0	457.2	381	368	508
20X16	500X400	508.0	406.4	381	356	508
20X14	500X350	508.0	355.6	381	356	508
20X12	500X300	508.0	323.9	381	346	508
20X10	500X250	508.0	273.1	381	333	-
20X8	500X200	508.0	219.1	381	324	-
24X22	600X550	610.0	559.0	432	432	508
24X20	600X500	610.0	508.0	432	432	508
24X18	600X450	610.0	457.0	432	419	508
24X16	600X400	610.0	406.4	432	406	508
24X14	600X350	610.0	355.6	432	406	-
24X12	600X300	610.0	323.9	432	397	-
24X10	600X250	610.0	273.1	432	384	-



REDUCING TEES



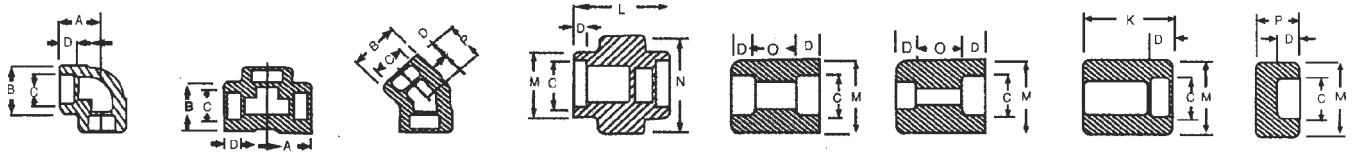
CONCENTRIC REDUCERS



ECCENTRIC REDUCERS

SOCKET WELD FITTING TO ANSI B-16.11

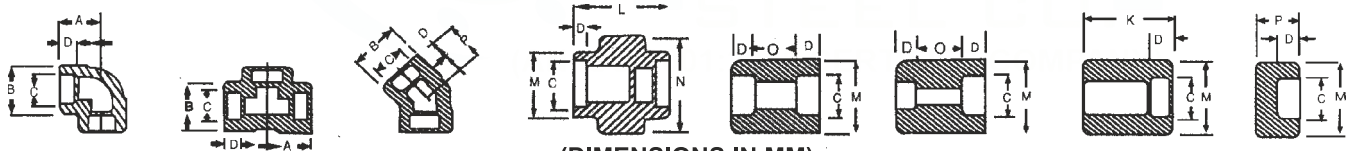
90° ELBOWS | TEE | 45° ELBOW | UNION | COUPLING | REDUCER | HALF COUPLING | CAP



NOM BORE	PIPE O.D.	3000 L.B.S.									COMMON FACTORS					6000 L.B.S.			
		A max.	B max.	K	J	L	M	N	P	Q	C min.	D min.	O min.	O max.	A	B	M	K	N
1/8"	10.3	22	18.5	26	16	40	17.3	32	15	10	10.7	10	5	8	22	22	20	25	46
1/4"	13.7	22	22	26	18	43	21.2	32	15	10	14.1	10	5	8	27	25	24	25	51
3/8"	17.2	25	25	26	19	48	25.4	36	16.5	10	17.6	10	3	9	27	28	28	26	60
1/2"	21.3	27	32	30	21	51	31	41	16.5	10	21.7	10	6	13	31	34	34	31	72
3/4"	26.7	34	38	36	24	57	37	50	19.5	13	27	13	6	13	37	42	41	35	80
1"	33.4	37	46	40	25	64	45.2	60	22.5	13	33.8	13	9	17	42	50	50	40	94
1 1/4"	42.2	42	56	40	29	70	55	70	22.5	13	42.6	13	9	17	47	59	58	41	100
1 1/2"	48.3	47	62	40	30	79	61.4	78	24	13	48.7	13	9	17	53	67	66	43	122
2"	60.3	56	75	52	37	89	75	95	29	13	61.2	16	15	23	59	84	83	55	
2 1/2"	73.02	60	92	52	48	114	91.3	125	32	16	73.8	16	14	24		102		56	
3"	89.00	76	110	52	51	127	108.8	140	35	16	89.8	16	14	24		121		58	
4"	114.50	88	137	58		150	136.9		42	19	115.5	19	14	24		152		64	

FORGED SCREWED FITTING TO ANSI B-16.11 3000/6000 LBS. THREADED TO ASA B 2.1

90° ELBOWS | TEE | 45° ELBOW | UNION | COUPLING | PIPE CAP | BUSHING | HEX HEAD PLUG



(DIMENSIONS IN MM)

NOM BORE	PIPE O.D.	3000 L.B.S.							COMMON FACTORS					6000 L.B.S.					
		A	B	C	G	H	K	D	E	F	I	J	L	A	B	C	G	H	K
1/8"	10.3	21	22	17	32	16	19	11	10	40	-	6	-	25	25	19	32	22	-
1/4"	13.7	25	25	19	35	19	25	16	11	43	3	6	32	29	33	22	35	25	27
3/8"	17.2	29	33	22	38	22	25	17.5	13	48	4	8	38	33	38	25	38	32	27
1/2"	21.3	33	38	25	48	29	32	22	15	51	5	8	46	38	46	29	48	38	33
3/4"	26.7	38	46	29	51	35	37	27	16	57	6	10	51	44	56	33	51	44	38
1"	33.4	44	56	33	60	44	41	35	19	64	6	10	60	51	62	35	60	57	43
1 1/4"	42.2	51	62	35	67	57	44	44.5	21	70	7	14	72	60	75	43	67	64	64
1 1/2"	48.3	60	75	43	79	64	44	51	21	79	8	16	80	64	84	44	79	76	48
2"	60.3	64	84	45	86	76	48	63.5	22	88	9	17	94	83	102	52	86	92	51
2 1/2"	73.02	83	102	52	92	92	60	76	27	118	10	21	122	95	121	64	92	108	64
3"	89.00	95	121	64	108	108	65	89	29	121	10	65	140	106	146	79	108	127	68
4"	114.50	114	152	79	121	140	68	117.5	32	150	13	25	180	114	152	79	121	159	75

DIMENSIONS AND OTHERS SPECIFICATIONS AS PER CUSTOMERS REQUIREMENTS ARE AVAILABLE ON REQUEST

MATERIALS CHEMICAL COMPOSITION & MECHANICAL PROPERTIES

Steel Type	ASTM Grade	Chemical Composition									Mechanical Composition				
		C% max	Mn%	P% max	S% max	Si%	Cr%	Mo%	Ni%	Others	R.min Tensile Strength Mpa	S.min Yield Strength Mpa	A%min.(21/4D) Elongation		Impact Test KCV (2) J
													Long.	Transv.	
A234	WPB(1)	0.3	0.29-1.06	0.05	0.058	0.10 min	0.4	0.15	0.4	Cu=0.4 V=0.08 Cb=0.02	415-585	240	30	20	-
	WPC(1)	0.35	0.29-1.06	0.05	0.058	0.10 min	0.4	0.15	0.4	Cu=0.4 V=0.08 Cb=0.02	485-655	275	30	20	-
A420	WPL/6(1)	0.3	0.6-1.35	0.035	0.04	0.15-0.30	0.3	0.12	0.4	Cu=0.4 V=0.08 Cb=0.02	415-585	240	30	16.5	-45°C 17.6/13.6
	WPL3	0.2	0.31-0.64	0.05	0.05	0.13-0.37	-	-	3.2-3.8	-	450-620	240	30	20	-101°C 17.6/13.6
A234	WPL1	0.28	0.30-0.9	0.045	0.045	0.10-0.50	-	0.44-0.65	-	-	380-550	205	30	20	-
	WP12CL1	0.05-0.2	0.3-.08	0.045	0.045	0.6	0.8-1.25	0.44-0.65	-	-	415-585	220	30	20	-
	WP12CL2	-	-	-	-	-	-	-	-	-	485-655	275	30	20	-
	WP11CL1	-0.5-0.15	0.3-0.6	0.3	0.3	0.5-10	1.0-1.5	0.44-0.65	-	-	415-585	205	30	20	-
	WP11CL2	0.5-0.15	0.3-0.8	0.4	0.4	0.5-10	1.0-1.5	0.44-0.65	-	-	485-655	275	30	20	-
	WP11CL3	-	-	-	-	-	-	-	-	-	520-690	310	30	20	-
	WP22CL1	0.5-0.15	0.3-0.6	0.04	0.04	0.55	1.9-2.6	0.87-113	-	-	415-585	205	30	20	-
	WP22CL3	-	-	-	-	-	-	-	-	-	520-690	310	30	20	-
	WP5	0.15	0.3-0.6	0.04	0.03	0.5	4.0-6.0	0.44-0.65	-	-	415-585	205	30	20	-
	WP9	0.15	0.3-0.6	0.03	0.03	0.25-10	8.0-10.0	0.9-1.10	-	-	415-585	205	30	20	-
	WP91	0.08-0.12	0.3-0.6	0.02	0.01	0.2-0.5	8.0-9.5	0.85-1.05	0.4	V=0.18-0.25 cb=0.06-010 N=0.03-0.07 A=0.04	585-760	415	20	-	-
A403	WP304	0.08	2	0.045	0.03	1	18-20	-	8.0-11.0	-	515	205	28	20	-
	WP304L	0.035	2	0.045	0.03	1	18-20	-	8.0-13.0	-	485	170	28	20	-
	WP304H	0.04-0.10	2	0.045	0.03	1	18-20	-	8.0-11.0	-	415	205	28	20	-
	WP316	0.08	2	0.045	0.03	1	18-20	2.0-3.0	11.0-14.0	-	415	205	28	20	-
	WP316L	0.035	2	0.045	0.03	1	18-20	2.0-3.0	10.0-16.0	-	485	170	28	20	-
	WP321	0.08	2	0.045	0.03	1	17.0-20.0	-	9.0-13.0	Ti=5xC max 0.70%	415	205	28	20	-
	WP321H	0.04-0.10	2	0.045	0.03	1	17.0-20.0	-	9.0-13.0	Ti=4xC max 0.60%	515	205	28	20	-
	WP347	0.08	2	0.045	0.03	1	17.0-20.0	-	9.0-13.0	Cb+Ta>=10x%C max 010%	515	205	28	20	-
	WP347H	0.04-0.10	2	0.045	0.03	1	17.0-20.0	-	9.0-13.0	Cb+Ta>=8x%C max 0.10%	515	205	28	20	-
	Wp31254	0.02	1	0.03	0.01	0.8	19.5-20.5	6.0-2.5	17.5-18.5	N=0.18-0.22 Cu=0.5-1.0	515	205	28	20	-
A815	S31803	0.03	2	0.03	0.02	1	21.0-23.0	2.5-3.5	4.5-6.5	N=0.08-0.2	620	450	25	-	-
	WP410	0.15	1	0.04	0.03	1	11.5-13.5	-	0.5	-	485-655	205	20	-	-
B366	WPNIC10	0.06-0.10	1.5		0.015	1	19.0-23.0	-	30.0-35.0	Cu=0.75 Al=0.15-0.60 Ti=0.15-0.60 Fe=39.5 min. Ai+Ti=0.85-1.20	450	170	30		
	WPNIC11	0.06-0.10	1.5		0.015	1	19.0-23.0	-	30.0-35.0		450	170	30		

Titanium Alloys Nickel Alloys, Inconel Alloys, Coupro Nickel & Aluminum Alloys Are Also Available Upon Request.

For Each Reduction Of 0.01% Below The Specified Carbon Max An Increase Of 0.06% Mn Above The Specified Max. Will Be Permitted Up To 1.35% Max.

(2) Relative To 10x10 Specimen.

CHEMICAL & PHYSICAL PROPERTIES OF C.S., S.S. & A.S., S.W. FORGED FITTINGS

ASTM A 105/A 105M Forged Socket Weld, Screwed, Flanges, Carbon Steel Pipe Fittings

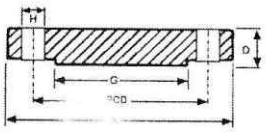
IASTM GRADE	C	MnSi	Si	S	P	Cr	Ni	Mo	Other Psi (Mpa)	Tensile (MPa)	Psi Yield %	Elongation in Area	Hardness	Reduction
A 105/105 M	0.35 max	0.60 1.05	0.35 max	0.50 max	0.04 max	-	-	-	-	70000 485	36000 (250)	30-Strip 22-Round	187 HB max	30 Round
A 182C1160&170 30000(20.29)	0.08 max	1.10 max	0.32 max	0.35min 0.50max	0.05 max	- -	- -	- -	- -	Cl.70-70000(49-46) Cl.60-60000(42.32)	30000 (200)	22	-	35

ASTM A 182/A 182M Austentic, Stainless Steel Forged (SW), Screwed, Flanges, For High Temps, Service

IA 182/182M F 304	0.08 max	2.00 max	1.00 max	0.03 max	0.04 max	18.0 20.0	8.0 11.0	-	-	75000 (515)	30000 (205)	30		50
A 182/182 M F 304L	0.035 max	2.00 max	1.00 max	0.03 max	0.04 max	18.0 20.0	18.0 13.0	-	-	70000 (485)	25000 (170)	30	23	50
A 182/182M F 316	0.08 max	2.00 max	1.00 max	0.03 max	0.04 max	16.0 18.0	10.0 14.0	2.0 3.0	-	75000 (515)	30000 (205)	30(Long) 25(Trans)	-	50 (Long) 45 (Trans)
A 182/182M F316L	0.035 max	2.00 max	1.00 max	0.03 max	0.04 max	16.0 18.0	10.0 15.0	2.0 3.0	-	70000 (485)	25000 (170)	30	-	50
A182/182M F 316 H	0.04 0.10	2.00 max	1.00 max	0.03 max	0.04 max	16.0 18.0	10.0 14.0	2.0 3.0	-	75000 (515)	30000 (205)	30	-	50
A182/182M F321	0.08 max	2.00 max	1.00 max	0.03 max	0.04 max	17.0 mm.	9.0 12.0	-	Tixc= 0.70max	75000 (515)	30000 (205)	30	-	50
A182/182M F310	0.15 max	2.00 max	1.00 max	0.03 max	0.04 max	24.0 26.0	19.0 22.0	-	-	75000 (515)	30000 (205)	30	-	50
A182/182M F317L	0.030 max	2.00 max	1.00 max	0.03 max	0.045 max	18.0 20.0	11.0 15.0	3.00 4.00	-	70000 (485)	25000 (170)	30	-	50 50
A182/182M F347H	0.04 0.10	2.00 max	1.00 max	0.03 max	0.04 max	17.0 20.0	9.0 13.0		Cb+Ta= 8.0=1.10	75000 (515)	30000 (205)	30	-	50

ASTM A182M Forged Alloy Steel, (SW), Screwed, Flanges, for High Temperature Service

IA 182/182M F1	0.28 max	0.60 0.90	0.15 0.35	0.045 max	0.045 max		-	0.44 0.65	-	70000 (485)	40000 (275)	20	143-192 Bremell Hrdn.	30
IA 182/182M F12 Class2	0.10 0.20	0.30 0.80	0.10 0.60	0.04 max	0.04 max	0.80 1.25	-	0.44 0.65	-	70000 (485)	40000 (275)	20	143-207	30
IA 182 / 182M F11 Class2	0.10 0.20	0.30 0.80	0.50 1.0	0.04 max	0.04 max	1.0 1.50	-	0.44 0.65	-	70000 (485)	40000 (275)	20	143-207	30
IA 182/1821M F22 Class3	0.05 0.15	0.30 0.60	0.5 max	0.04 max	0.04 max	2.0 2.50	- -	0.87 1.13	- -	75000 (515)	45000 (310)	20	156-207	30
IA 182/182M F5	0.15 max	0.30 0.60	0.50 max	0.03 max	0.03 max	4.0 6.0	0.5 max	0.44 0.65		70000 (485)	40000 (275)	20	143-217	35
IA 182/182M F9	0.15 max	0.30 0.60	0.5 max	0.03 max	0.03 max	8.0 10.0	-	0.90 1.10	-	85000 (585)	55000 (386)	20	179-217	40



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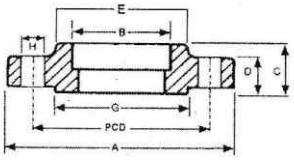
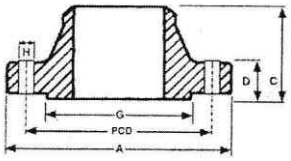
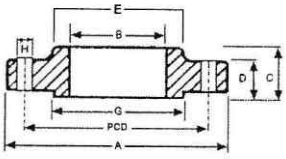


SOCKET WELDING (SW)



WELDING NECK (WN)



SLIP-ON WELDING (SOW)

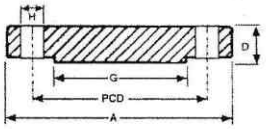
Class 150 Flanges to ANSI B 16.5

Nominal Size		Dimensions													Weight (kg)		
							Length Thru Hub		Bolt Drilling								
DN	NPS	Flange OD A mm	Flange Thickness D mm	Bore SOW SW B mm	Raised Face Diam. G mm	Dia of Hub E mm	Sow, SW Threaded C mm	W Neck C mm	Circle Diam. PCD mm	Hole Diam. H mm	Bolts No.	Bolts Diam. In	RF Stud Bolt Length mm	RF Mach Bolt Length mm	SOW SW	WN	Blind
15	1/2	88.9	11.2	22.4	35.1	30.2	15.8	47.8	60.4	15.7	4	½"	60.0	45.0	0.4	0.5	0.4
20	3/4	98.6	12.7	27.7	42.9	38.1	15.8	52.3	69.9	15.7	4	½"	65.0	50.0	0.6	0.7	0.6
25	1	107.9	14.2	34.8	50.8	49.2	17.5	55.6	79.2	15.7	4	½"	65.0	55.0	0.8	1.0	0.9
32	1.1/4	117.5	15.7	43.2	63.5	58.7	20.6	57.2	88.9	15.7	4	½"	70.0	55.0	1.0	1.3	1.2
40	1.1/2	127.0	17.5	49.5	73.2	65.1	22.4	62.0	98.6	15.7	4	½"	70.0	60.0	1.3	1.7	1.5
50	2	152.4	19.1	62.0	91.9	77.8	25.5	63.5	120.7	19.1	4	⅝"	80.0	65.0	2.1	2.6	2.4
65	2.1/2	177.8	22.2	74.7	104.6	90.5	28.5	69.9	139.7	19.1	4	⅝"	90.0	75.0	3.3	4.1	3.9
80	3	190.5	23.8	90.7	127.0	107.9	30.2	69.9	152.4	19.1	4	⅝"	90.0	75.0	3.9	4.9	4.9
100	4	228.6	23.8	116.1	157.2	134.9	33.3	76.2	190.5	19.1	8	⅝"	90.0	75.0	5.3	6.8	7.0
125	5	254.0	23.8	143.8	185.7	163.5	36.6	88.9	215.9	22.4	8	¾"	90.0	80.0	6.1	8.6	8.6
150	6	279.4	25.4	170.7	215.9	192.1	39.6	88.9	241.3	22.4	8	¾"	100.0	85.0	7.5	10.6	11.3
200	8	342.9	28.4	221.5	269.7	246.1	44.5	101.6	298.5	22.4	8	¾"	110.0	90.0	12.1	17.6	19.6
250	10	406.4	30.2	276.4	323.9	304.8	49.3	101.6	362.0	22.4	12	⅞"	115.0	95..0	16.5	24.0	28.8
300	12	482.6	31.8	327.2	381.0	365.1	55.6	114.3	431.8	25.4	12	⅞"	120.0	100.0	26.2	36.5	43.2
350	14	533.4	35.1	359.2	412.8	400.0	57.2	127.0	476.3	28.4	12	1"	130.0	110.0	34.6	48.4	58.1
400	16	596.9	36.6	410.5	469.9	457.2	63.5	127.0	539.8	28.4	16	1"	135.0	115.0	44.8	60.6	76.1
450	18	635.0	39.6	461.8	533.4	504.8	68.3	139.7	577.9	31.8	16	1 ⅛"	150.0	125.0	48.9	68.3	93.7
500	20	698.5	42.9	513.1	584.2	558.8	73.2	144.5	635.0	31.8	20	1 ⅛"	160.0	135.0	61.9	84.5	122.0
600	24	812.8	47.8	616.0	692.2	663.6	82.6	152.4	749.3	35.1	20	1 ¼"	175.0	145.0	86.9	115.0	185.0

Class 300 Flanges to ANSI B 16.5

Nominal Size		Dimensions													Weight (kg)		
							Length Thru Hub		Bolt Drilling								
DN	NPS	Flange OD A mm	Flange Thickness D mm	Bore SOW SW B mm	Raised Face Diam. G mm	Dia of Hub E mm	Sow, SW Threaded C mm	W Neck C mm	Circle Diam. PCD mm	Hole Diam. H mm	Bolts No.	Bolt Diam. In	RF Stud Bolt Length mm	RF Mach Bolt Length mm	SOW SW	WN	Blind
15	1/2	95.3	14.2	22.4	35.1	38.1	22.4	52.3	66.5	15.7	4	½"	65.0	55.0	0.6	0.8	0.6
20	3/4	117.3	15.7	27.7	42.9	47.6	25.4	57.2	82.6	19.1	4	⅝"	75.0	60.0	1.1	1.3	1.1
25	1	124.0	17.5	34.5	50.8	54.0	26.9	62.0	88.9	19.1	4	⅝"	80.0	65.0	1.4	1.5	1.4
32	1.1/4	133.4	19.1	43.2	63.5	63.5	26.9	65.0	98.6	19.1	4	⅝"	80.0	65.0	1.7	2.0	1.8.
40	1.1/2	155.5	20.6	49.5	73.2	69.7	30.2	68.3	114.3	22.4	4	¾"	90.0	75.0	2.5	2.9	2.7
50	2	165.1	22.2	62.0	91.9	84.1	33.3	69.9	127.0	19.1	8	⅝"	90.0	75.0	2.9	3.4	3.2
65	2.1/2	190.5	25.4	74.7	104.6	100.0	38.1	76.2	149.4	22.4	8	¾"	100.0	85.0	4.3	5.2	4.9
80	3	209.5	28.4	90.7	127.0	117.5	42.9	79.2	168.1	22.4	8	¾"	110.0	90.0	5.9	6.9	6.8
100	4	254.0	31.8	116.1	157.2	146.0	47.8	85.9	200.2	22.4	8	¾"	110.0	95.0	9.6	11.2	11.5
125	5	279.4	35.1	143.8	185.7	177.8	50.8	98.6	235.0	22.4	8	¾"	120.0	100.0	12.3	15.1	15.6
150	6	317.5	36.6	170.7	215.9	206.4	52.3	98.6	269.7	22.4	12	¾"	125.0	105.0	15.6	19.1	20.9
200	8	381.0	41.1	221.5	209.7	260.3	62.0	112.3	330.2	25.4	12	⅞"	140.0	110.0	24.2	29.3	34.3
250	10	444.5	47.6	276.4	323.9	320.7	66.5	117.3	387.4	28.4	16	1"	155.0	130.0	37.1	42.7	53.3
300	12	520.7	50.8	327.2	381.0	374.6	73.2	130.0	450.9	31.8	16	1 ⅛"	170.0	145.0	49.8	61.8	78.8
350	14	584.2	53.8	359.2	412.8	425.4	76.2	142.7	514.4	31.8	20	1 ⅛"	175.0	150.0	69.9	85.8	105.0
400	16	647.7	57.2	410.5	469.9	482.6	82.6	146.1	571.5	35.1	20	1 ¼"	190.0	160.0	88.1	106.0	135.0
450	18	711.2	60.5	461.8	533.4	533.4	88.9	158.8	626.7	35.1	24	1 ¼"	195.0	170.0	109.0	131.0	175.0
500	20	774.7	63.5	513.1	584.2	587.4	95.3	162.1	685.8	35.1	24	1 ¼"	205.0	180.0	134.0	158.0	221.0
600	24	914.4	70.0	516.0	691.2	701.7	106.4	168.1	812.8	41.1	24	1 ½"	230.0	195.0	201.0	230.0	338.0

Notes: 1) All weights are approximate. 2) For Class 150, 300 the flanges thickness "D" dimension includes approx. 1.5 mm for the raised face height for Class 600, 900, 1500, 2500 the flange thickness does not included the raised face height and approx. 6.35mm must be added to D dimension. 3) Bolt length dimensions incorporate the height of the raised face. 4) Welding Neck bore is derived from the pipe schedule.



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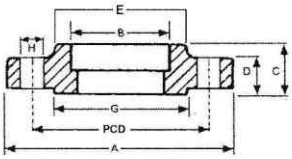
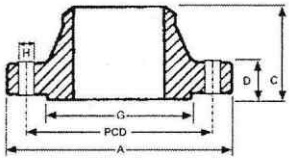
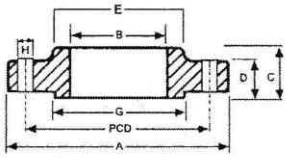


SOCKET WELDING (SW)



WELDING NECK (WN)



SLIP-ON WELDING (SOW)

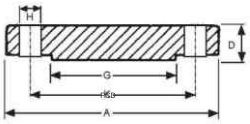
Class 600 Flanges to ANSI B 16.5

Nominal Size		Dimensions											RF Stud Bolt Length mm	Weight (kg)		
							Length Thru Hub		Bolt Drilling							
DN	NPS	Flange OD A mm	Flange Thickness D mm	Bore SOW SW B mm	Raised Face Diam. G mm	Dia of Hub E mm	Sow, SW Threaded C mm	W Neck C mm	Circle Diam. PCD mm	Hole Diam. H mm	Bolts No.	Bolt Diam. In		SOW SW	WN	Blind
15	1/2	95.3	14.2	22.4	35.1	38.1	22.4	52.3	66.5	15.7	4	½"	80.9	0.7	0.9	0.8
20	3/4	117.3	15.7	27.7	42.9	47.6	25.4	57.2	82.6	19.1	4	⅝"	90.0	1.3	1.5	1.3
25	1	124.0	17.5	34.5	50.8	54.0	26.9	62.0	88.9	19.1	4	⅝"	90.0	1.5	1.8	1.6
32	1.1/4	133.4	20.6	43.2	63.5	63.5	28.4	66.5	98.6	19.1	4	⅝"	100.0	2.0	2.5	2.2
40	1.1/2	155.4	22.4	49.5	73.2	69.8	31.8	69.9	114.3	22.4	4	¾"	105.0	3.0	3.5	3.3
50	2	165.1	25.4	62.0	91.9	84.1	36.6	73.2	127.0	19.1	8	⅝"	105.0	3.6	4.4	4.2
65	2.1/2	190.5	28.6	74.7	104.6	100.0	41.1	79.2	149.4	22.4	8	¾"	120.0	5.3	6.4	6.1
80	3	209.6	31.8	90.7	127.0	117.5	46.0	82.6	168.1	22.4	8	¾"	125.0	7.0	8.5	8.4
100	4	273.1	38.1	116.1	157.2	152.4	53.8	101.6	215.9	25.4	8	⅞"	145.0	14.5	17.4	17.3
125	5	330.2	44.5	143.8	185.7	188.9	60.5	114.3	266.7	28.4	8	1"	165.0	24.4	29.2	29.4
150	6	355.6	47.8	170.7	215.9	222.2	66.5	117.3	292.1	28.4	12	1"	170.0	28.7	34.9	36.1
200	8	419.1	55.6	221.5	269.7	273.0	76.2	133.4	349.3	31.8	12	1 ⅛"	195.0	43.4	53.9	58.9
250	10	508.0	63.5	276.4	323.0	342.9	85.9	152.4	431.8	35.1	16	1 ¼"	215.0	70.3	86.5	97.5
300	12	558.8	66.5	327.2	381.0	400.0	91.9	155.4	489.0	35.1	20	1 ¼"	220.0	84.2	103.0	124.0
350	14	603.3	69.9	359.2	412.8	431.8	93.7	165.1	527.1	38.1	20	1 ⅜"	235.0	98.7	122.0	151.0
400	16	685.8	76.2	410.5	469.9	495.3	106.4	177.8	603.3	41.1	20	1 ½"	255.0	142.0	170.0	214.0
450	18	743.0	82.6	461.8	533.4	546.1	117.3	184.2	654.1	44.5	20	1 ⅝"	275.0	173.0	204.0	272.0
500	20	812.8	88.9	513.1	584.2	609.6	127.0	190.5	723.9	44.5	24	1 ⅝"	290.0	220.0	254.0	349.0
600	24	939.8	101.6	616.0	692.2	717.5	139.7	203.2	838.2	50.8	24	1 ⅞"	330.0	312.0	358.0	533.0

Class 900 Flanges to ANSI B 16.5

Nominal Size		Dimensions											RF Stud Bolt Length mm	Weight (kg)		
							Length Thru Hub		Bolt Drilling							
DN	NPS	Flange OD A mm	Flange Thickness D mm	Bore SOW SW B mm	Raised Face Diam. G mm	Dia of Hub E mm	Sow, SW Threaded C mm	W Neck C mm	Circle Diam. PCD mm	Hole Diam. H mm	Bolts No.	Bolt Diam. In		SOW SW	WN	Blind
15	1/2	120.7	22.4	22.4	35.1	38.1	31.8	60.5	82.6	22.4	4	3/4"	105.0	1.8	1.9	1.8
20	3/4	130.0	25.4	27.7	42.9	44.4	35.1	70.0	88.9	22.4	4	3/4"	115.0	2.4	2.6	2.4
25	1	149.4	28.6	34.5	50.8	52.4	41.1	73.2	101.6	25.4	4	7/8"	125.0	3.6	3.7	3.5
32	1 1/4	158.8	28.6	43.2	63.5	63.5	41.1	73.2	111.3	25.4	4	7/8"	125.0	4.0	4.3	4.1
40	1 1/2	177.8	31.8	49.5	73.2	69.8	44.5	82.6	124.0	28.4	4	1"	140.0	5.5	5.9	5.8
50	2	215.9	38.1	62.0	91.9	104.8	57.2	101.6	165.1	25.4	8	7/8"	145.0	10.2	10.8	10.1
65	2 1/2	244.3	41.1	74.7	104.5	123.8	63.5	104.6	190.5	28.4	8	1"	150.0	13.9	15.0	14.0
80	3	241.3	38.1	90.7	127.0	127.0	53.8	101.6	190.5	25.4	8	7/8"	145.0	11.6	13.7	13.1
100	4	292.1	44.5	116.1	157.2	158.7	69.9	114.3	235.0	31.8	8	1 1/8"	170.0	19.7	22.5	26.9
125	5	349.3	50.8	148.8	185.7	190.5	79.2	127.0	279.4	35.1	8	1 1/4"	190.0	31.9	37.4	36.5
150	5	381.0	55.6	170.7	215.9	234.9	85.9	139.7	317.5	31.8	12	1 1/8"	195.0	41.1	47.7	47.4
200	8	469.9	63.5	221.5	269.7	298.4	101.6	162.1	393.7	38.1	12	1 3/8"	220.0	70.7	81.3	82.5
250	10	546.1	69.9	276.4	323.9	368.3	108.0	184.2	469.9	38.1	16	1 3/8"	235.0	101.0	119.0	122.0
300	12	609.6	79.2	327.2	381.0	419.1	117.3	200.2	533.4	38.1	20	1 3/8"	255.0	133.0	157.0	173.0

Notes: 1) All weights are approximate. 2) For Class 150, 300 the flanges thickness "D" dimension includes approx. 1.5 mm for the raised face height for Class 600, 900, 1500, 2500 the flange thickness does not included the raised face height and approx. 6.35mm must be added to D dimension. 3) Bolt length dimensions incorporate the height of the raised face. 4) Welding Neck bore is derived from the pipe schedule.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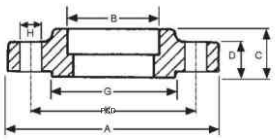
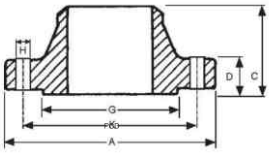
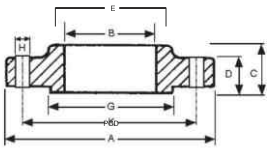

SOCKET WELDING (SW)


WELDING NECK (WN)


SLIP-ON WELDING (SOW)

Class 1500 Flanges to ANSI B 16.5

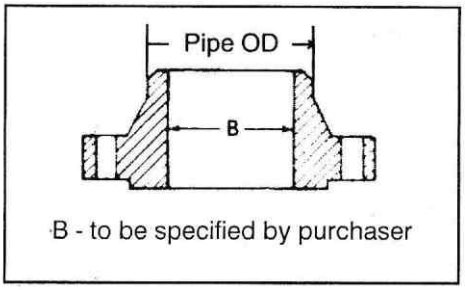
Nominal Size		Dimensions													Weight (kg)	
							Length Thru Hub		Bolt Drilling							
DN	NPS	Flange OD A mm	Flange Thickness D mm	Bore SOW SW B mm	Raised Face Diam. G mm	Dia of Hub E mm	Sow, SW Threaded C mm	W Neck C mm	Circle Diam. PCD mm	Hole Diam. H mm	Bolts No.	Bolt Diam. In	RF Stud Bolt Length mm	SOW SW	WN	Blind
15	½	120.7	22.4	22.4	35.1	38.1	31.8	50.5	82.6	22.4	4	¾"	105.0	1.8	1.9	1.8
20	¾	130.0	25.4	27.7	42.9	44.4	35.1	69.9	88.9	22.4	4	¾"	115.0	2.4	2.6	2.4
25	1	149.4	28.6	34.5	50.8	52.4	41.1	73.2	101.6	25.4	4	⅞"	125.0	3.6	3.7	3.6
32	1 ¼	158.8	28.6	43.2	63.5	63.5	41.1	73.2	111.3	25.4	4	⅞"	125.0	4.0	4.3	4.1
40	1 ½	177.8	31.8	49.5	73.2	69.8	44.5	82.6	124.0	28.4	4	1"	140.0	5.5	5.9	5.8
50	2	215.9	38.1	62.0	91.9	104.8	57.2	101.6	165.1	25.4	8	⅞"	145.0	10.2	10.8	10.1
65	2 ½	244.3	41.1	74.7	104.5	123.8	63.5	104.6	190.5	28.4	8	1	160.0	13.9	15.0	14.0
80	3	266.7	47.8	90.7	127.0	133.3		117.3	203.2	31.8	8	1 ⅛"	180.0		19.9	19.1
100	4	311.2	53.8	116.1	157.2	161.9		124.0	241.3	35.1	8	1 ¼"	195.0		29.9	29.9
125	5	374.7	73.2	143.8	185.7	196.8		155.4	292.1	41.1	8	1 ½"	250.0		55.4	58.4
150	5	393.7	82.6	170.7	215.9	228.6		171.5	317.5	38.1	12	1 ⅜"	260.0		68.4	71.8
200	8	482.6	91.9	221.5	268.7	292.1		212.9	393.7	44.5	12	1 ⅝"	290.0		117.0	122.0
250	10	594.2	108.0	276.4	323.9	368.3		254.0	482.6	50.8	12	1 ⅞"	335.0		194.0	210.0
300	12	673.1	124.0	327.2	381.0	450.8		282.4	571.5	53.8	16	2"	375.0		288.0	316.0

Class 2500 Flanges to ANSI B 16.5

Nominal Size		Dimensions											Weight (kg)	
						Length Thru Hub		Bolt Drilling						
DN	NPS	Flange OD A mm	Flange Thickness D mm	Raised Face Diam. G mm	Dia of Hub E mm	Sow, SW Threaded C mm	W Neck C mm	Circle Diam. PCD mm	Hole Diam. H mm	Bolts No.	Bolt Diam. In	RF Stud Bolt Length mm	WN	Blind
15	½	133.4	30.2	35.1	42.9	39.6	73.2	88.9	22.4	4	3/4"	125.0	3.1	3.0
20	¾	139.7	31.8	42.9	50.8	42.9	79.2	95.3	22.4	4	3/4"	125.0	3.7	3.5
25	1	158.8	35.1	50.8	57.1	47.8	88.9	108.0	25.4	4	7/8"	140.0	5.2	5.0
32	1 ¼	184.2	38.1	63.5	73.0	52.3	95.3	130.0	28.4	4	1"	150.0	7.7	7.4
40	1 ½	203.2	44.5	73.2	79.4	60.5	111.3	146.1	31.8	4	1 1/8"	170.0	10.9	10.4
50	2	235.0	50.8	91.9	95.2	69.9	127.0	171.5	28.4	8	1"	175.0	16.2	15.6
65	2 ½	266.7	57.2	104.6	114.3	79.2	142.7	196.9	31.8	8	1 1/8"	195.0	23.7	22.6
80	3	304.8	66.5	127.0	133.3		168.1	228.6	35.1	8	1 1/4"	220.0	36.2	34.8
100	4	355.6	76.2	157.2	165.1		190.5	273.1	41.1	8	1 1/2"	255.0	55.3	53.9
125	5	419.1	91.9	185.7	203.2		228.6	323.9	47.8	8	1 3/4"	300.0	92.5	90.8
150	5	482.6	108.0	215.9	234.9		273.1	368.3	53.8	8	2"	345.0	143.0	141.0
200	8	552.5	127.0	269.7	304.8		317.5	438.2	53.8	12	2"	380.0	215.0	214.0
250	10	673.1	165.1	323.9	374.6		419.1	539.8	66.5	12	2 1/2"	485.0	406.0	411.0
300	12	762.0	184.2	381.0	441.3		463.6	619.3	73.2	16	2 3/4"	540.0	572.0	592.0

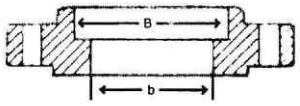
Notes: 1) All weights are approximate. 2) For Class 150, 300 the flanges thickness "D" dimension includes approx. 1.5 mm for the raised face height for Class 600, 900, 1500, 2500 the flange thickness does not included the raised face height and approx. 6.35mm must be added to D dimension. 3) Bolt length dimensions incorporate the height of the raised face. 4) Welding Neck bore is derived from the pipe schedule.

WELDING NECK FLANGE



B - to be specified by purchaser

SOCKET-WELD FLANGE



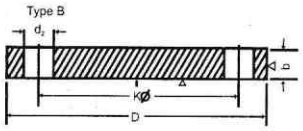
B - Dia of Bore as per size
b - to be specified by purchaser

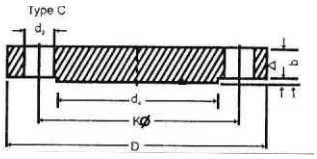
WELDING NECK FLANGE BORES (B)

Nominal Pipe Size	Outside Diam	Sch 20	Sch 30	Std Wall	Sch 40	Extra Strong	Sch 80	Sch 120	Sch 160	Double Extra Strong
15	21.33	-	-	15.7	15.7	13.8	13.8	-	11.7	6.4
20	26.67	-	-	20.8	20.8	18.8	18.8	-	15.5	11.0
25	33.40	-	-	26.6	25.4	24.3	24.3	-	20.7	15.2
32	42.16	-	-	35.0	35.0	32.4	32.4	-	29.4	22.7
40	48.26	-	-	40.8	40.8	38.1	38.1	-	33.7	27.9
50	60.31	-	-	52.3	52.3	49.2	49.2	-	42.8	38.1
65	73.02	-	-	62.4	62.4	59.0	59.0	-	53.9	44.9
80	88.90	-	-	77.9	77.9	73.6	73.6	-	66.6	58.4
100	114.30	-	-	102.2	102.2	97.1	97.1	92.0	87.3	80.0
125	141.30	-	-	128.1	128.1	122.2	122.2	115.9	109.5	103.2
150	168.27	-	-	154.0	154.0	146.3	146.3	139.7	131.7	124.3
200	219.07	206.2	204.9	202.7	202.7	193.6	193.6	182.5	173.0	174.6
250	273.05	260.3	257.4	254.5	254.5	247.6	242.8	230.1	215.9	22.2
300	323.85	311.1	307.0	304.8	303.2	298.4	288.8	273.0	257.2	273.0
350	355.60	337.8	336.5	336.5	333.3	330.2	317.5	300.0	284.1	-
400	406.40	390.3	387.3	387.3	381.0	381.0	363.5	344.5	325.4	-
450	457.20	441.1	434.9	438.1	428.6	431.8	409.5	387.3	366.7	-
500	508.00	488.9	482.6	488.9	477.8	482.6	455.6	431.8	407.9	-
600	609.60	590.5	581.0	590.5	574.6	584.2	547.6	517.5	490.5	-

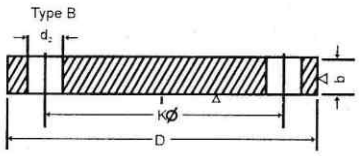
All Dimensions are in Millimeters

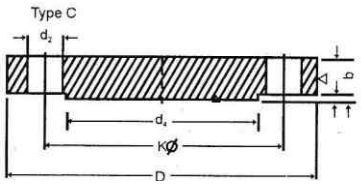
DIN 2527





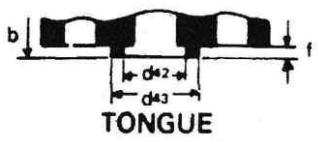
	NW	D	Flange b	k	Raised Face d4	f	No.	Bolts		dia.of Bolt Holt	Weight of One Flange (7.85kg/dm3) Type-B Type-C) d2	kg
ND-6	10	75	12	50	35	2	4	M 10	–	11.5	0.38	0.33
	15	80	12	55	40	2	4	M 10	–	11.5	0.44	0.38
	20	90	14	65	50	2	4	M 10	–	11.5	0.65	0.59
	25	100	14	75	60	2	4	M 10	–	11.5	0.82	0.74
	32	120	14	90	70	2	4	M 12	(½")	14	1.17	1.07
	40	130	14	100	80	3	4	M 12	(½")	14	1.39	1.21
	50	140	14	110	90	3	4	M 12	(½")	14	1.62	1.43
	65	160	14	130	110	3	4	M 12	(½")	14	2.44	2.21
	80	190	16	150	128	3	4	M 16	(⅝")	18	3.43	3.09
	100	210	16	170	148	3	4	M 16	(⅝")	18	4.76	4.37
	125	240	18	200	178	3	8	M 16	(⅝")	18	6.11	5.68
	150	265	18	225	202	3	8	M 16	(⅝")	18	7.51	7.02
	(175)	295	20	255	232	3	8	M 16	(⅝")	18	10.4	9.85
	200	320	20	280	258	3	8	M 16	(⅝")	18	12.3	11.7
	250	375	22	335	312	3	12	M 16	(⅝")	18	18.3	17.6
	300	440	22	395	365	4	12	M 20	(¾")	23	25.3	24.0
	350	490	22	445	415	4	12	M 20	(¾")	23	31.6	30.1
	400	540	22	495	465	4	16	M 20	(¾")	23	38.4	36.4
	500	645	24	600	570	4	20	M20	(¾")	23	60.4	58.1
ND-10 Note from 10 mm to 175 mm See ND-16	200	340	24	295	268	3	8	M 20	(¾")	23	16.5	15.8
	250	395	26	350	320	3	12	M 20	(¾")	23	24.0	23.1
	300	445	26	400	370	4	12	M 20	(¾")	23	30.9	29.4
	350	505	26	460	430	4	16	M 20	(¾")	23	40.6	38.0
	400	565	26	515	482	4	16	M 24	(⅞")	27	49.4	47.5
	500	670	28	620	585	4	20	M 24	(⅞")	27	75.0	72.7
ND-16 Note : for DIN 2527ND-10-4 Holes	10	90	14	60	40	2	4	M 12	(½")	14	0.63	0.56
	15	95	14	65	45	2	4	M 12	(½")	14	0.72	0.64
	20	105	16	75	58	2	4	M 12	(½")	14	1.01	0.93
	25	115	16	85	68	2	4	M 12	(½")	14	1.23	1.13
	32	140	16	100	78	2	4	M 16	(⅝")	18	1.80	1.66
	40	150	16	110	88	3	4	M 16	(⅝")	18	2.09	1.85
	50	165	18	125	102	3	4	M 16	(⅝")	18	2.88	2.59
	65	185	18	145	122	3	4	M 16	(⅝")	18	3.66	3.33
	80	200	20	160	138	3	4/8	M 16	(⅝")	18	4.77	4.34
	100	220	20	180	158	3	8	M 16	(⅝")	18	5.65	5.26
	125	250	22	210	188	3	8	M 16	(⅝")	18	8.42	7.67
	150	285	22	240	212	3	8	M 20	(¾")	23	10.4	9.85
	(175)	315	24	270	242	3	8	M 20	(¾")	23	14.0	13.5
	200	340	24	295	268	3	12	M 20	(¾")	23	16.1	15.6
	250	405	26	355	320	3	12	M 24	(⅞")	27	24.9	23.9
	300	460	28	410	378	4	12	M 24	(⅞")	27	35.1	33.6
	350	520	30	470	438	4	16	M 24	(⅞")	27	47.8	46.2
	400	580	32	525	490	4	16	M 27	(1")	30	63.5	61.5
	500	715	34	650	610	4	20	M 30	(1⅛")	33	102	99.5





	NW	D	Flange b	k	Raised Face d_4	f	No.	Bolts		Dia. of Bolt Holt d_2	Weight of One Flange (7.85 kg/dm3) Type - B Kg	Type- C) Kg
	(175)	339	28	280	248	3	12	M 24	(7/8")	27	17.3	16.5
	200	360	30	310	278	3	12	M 24	(7/8")	27	22.3	21.5.
	250	425	32	370	335	3	12	M 27	(1")	30	33.5	32.5
ND-25	300	485	34	430	395	4	16	M 27	(1")	30	46.3	44.7
Note: From 10 mm to 150 m	350	55	38	490	450	4	16	M 30	(1 1/8")	33	68.0	65.9
See ND-40	400	620	40	550	505	4	16	M 33	(1 ¼")	36	89.7	87.0
	500	730	44	660	615	4	20	M 33	(1 ¼")	36	138	134
	10	90	16	60	40	2	4	M12	(½")	14	0.72	0.62
	15	95	16	65	45	2	4	M12	(½")	14	0.81	0.74
	20	105	18	75	58	2	4	M12	(½")	14	1.24	1.05
	25	115	18	85	68	2	4	M 12	(½")	14	1.38	1.31
	32	140	18	100	78	2	4	M 16	(⅝")	18	2.03	1.82
	40	150	18	110	88	3	4	M16	(⅝")	18	2.35	2.11
	50	165	20	125	102	3	4	M 16	(⅝")	18	3.20	2.91
ND-40	65	185	22	145	122	3	8	M 16	(⅝")	18	4.29	4.13
	80	200	24	160	138	3	8	M 16	(⅝")	18	5.88	5.21
	100	236	24	190	162	3	8	M 20	(¾")	23	7.54	7.08
	125	270	26	220	188	3	8	M 24	(⅞")	27	10.8	10.4
	150	300	28	250	218	3	8	M 24	(⅞")	27	14.5	13.9
	175	350	32	295	260	3	12	M 27	(1")	30	22.1	21.3
	200	375	34	320	285	3	12	M 27	(1")	30	27.2	26.2
	250	450	38	385	345	3	12	M 30	(1 ⅛")	33	43.8	43.1
	300	515	42	450	410	4	16	M 30	(1 ⅛")	33	63.3	62.2
	350	580	46	510	465	4	16	M 33	(1 ¼")	36	89.5	87.2
	400	660	50	585	535	4	16	M 36	(1 ⅜")	39	127	124
	500	755	52	670	615	4	20	M 39	(1½")	42	172	168

Flange Facings Tongue And Groove, Nominal Pressure 10 To 100 Acording to Din 2512



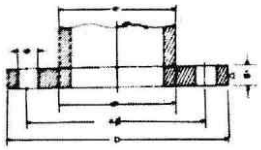
TONGUE

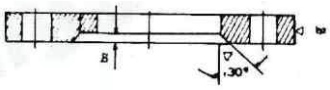
GROOVE

Nominal Tongue				Groove			Nominal Tongue				Groove		
Pipe Size	d_{42} + 0.5	d_{43} -0.5	f_1 + 0.5	d_{41} -0.5	d_{44} +0.5	f_2 -0.5	Pipe Size	d_{42} + 0.5	d_{43} -0.5	f_1 + 0.5	d_{41} -0.5	d_{44} +0.5	f_2 -0.5
10	24	34	4	23	35	3	175	213	233	4.5	212	234	3.5
15	29	39	4	28	40	3	200	239	259	4.5	238	260	3.5
20	36	50	4	35	51	3	250	292	312	4.5	291	313	3.5
25	47	57	4	42	58	3	300	343	363	4.5	342	364	3.5
32	51	65	4	50	66	3	350	395	421	5	394	422	4
40	61	75	4	60	76	3	400	447	473	5	446	474	4
50	73	87	4	72	88	3	500	549	575	5	548	576	4
65	95	109	4	94	110	3	600	649	675	5	648	676	4
80	106	120	4	105	121	3	700	751	777	5	750	778	4
100	129	149	4.5	128	150	3.5	800	856	882	5	855	883	4
125	155	175	4.5	154	176	3.5	900	961	987	5	960	988	4
150	183	203	4.5	182	204	3.5	1000	1061	1091	6	1060	1092	5

DIN 2576
Flanges, Slip - on type for Brasing or Welding Nominal Pressure 10

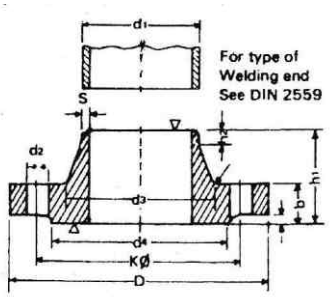
Pipe		Flange				Bolts				Weight of One Flange (7.85 kg/dm³)
NW	d_1	ds	D	b_1	K	No.	Thread		d_2	Kg
10	14 17.2*)	14.5 17.7	90	14	60	4	M 12	(½")	14	0.613 0.605
15	20 21.3*)	20.5 21.8	95	14	65	4	M 12	(½")	14	0.675 0.669
20	25 26.9*)	25.5 27.4	105	16	75	4	M 12	(½")	14	0.947 0.936
25	30 33.7*)	30.5 34.2	115	16	85	4	M 12	(½")	14	1.14 1.11
32	38 42.4*)	38.5 42.9	140	16	100	4	M 16	(⅝")	18	1.66 1.62
40	44.5 48.3*)	45 48.8	150	16	110	4	M 16	(⅝")	18	1.89 1.86
50	57 60.3*)	57.5 60.8	165	18	125	4	M 16	(⅝")	18	2.51 2.47
65	76.1*)	76.6	185	18	145	4	M 16	(5/8")	18	3.00
80	88.9*)	89.4	200	20	160	4	M 16	(5/8")	18	3.79
100	108 114.3*)	108.5 114.8	220	20	180	8	M 16	(⅝")	18	4.20 4.03
125	133 139.7*)	133.5 140.2	250	22	210	8	M 16	(⅝")	18	5.71 5.46
150	159 168.3*)	159.5 168.8	285	22	240	8	M 20	(¾")	23	6.72 6.57
175	191 193.7*)	192 194.7	315	24	270	8	M 20	(¾")	23	8.60 8.45
200	216 219.1*)	217 220.1	340	24	295	8	M 20	(¾")	23	9.50 9.31
250	267 273*)	268 274	395	26	350	12	M 20	(¾")	23	12.5 11.9
300	318 323.9*)	319 324.9	445	26	400	12	M 20	(¾")	23	14.4 13.8
350	355.6*) 368	356.6 369	505	28	460	18	M 20	(¾")	23	20.6 19.0
400	406.4*) 419	407.4 420	565	32	515	16	M 24	(⅞")	27	27.9 25.9
500	508*) 521	509 522	670	38	620	20	M 24	(⅞")	27	37.9 41.1



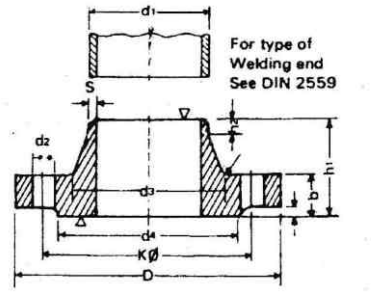


DIN 2632
Welding Neck Flanges for Nominal Pressure 10

Pipe		Flange				Neck				Raised face		Bolts				Weight of one Flange 7.85 kg / Dm3) kg
NW	d_1	D	b	k	h_1	d_3	s	-s	h_2	d_4	f	No.	Thread		d_2	
200	216 219.1	340	24	295	62	232 235	5.9	10	16	268	3	8				11.3
250	267 273	395	26	350	68	285 292	6.3	12	16	320	3					14.7
300	318 323.9	445	26	400	68	335 344	7.1	12	16	370	4	12	M 20	(¾")	23	17.6
350	355.6 368	505	26	460	68	385	7.1	12	16	430	4					21.4
400	406.4 419	565	26	515	72	440	7.1	12	16	482	4	16				26.1
500	508 521	670	28	620	75	542	7.1	12	16	585	4		M 24	(⅞")	27	34.7
600	609.6 622	780	28	725	80	642	7.1	12	18	685	5	20	M 27	(1")	30	42.2



Notes: For Nominal Sizes 10 upto 175 See DIN-2633.



DIN 2633

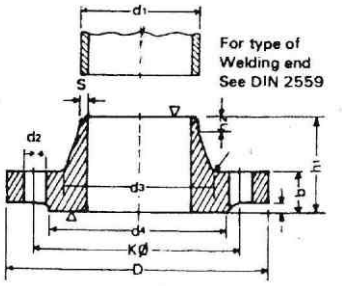
Welding Neck Flanges for Nominal Pressure 16

Pipe		Flange				Neck				Raised face		Bolts			d2	Weight of one Flange 7.85 kg / Dm3) kg
NW	d1	D	b	k	h1	d3	s	r	h2	d4	f	No.	Thread			
10	14	90	14	60	35	25	1.8	4	6	40	2	4	M 12	(½")	14	0.580
	17.2					28										
15	20	95	14	65	35	30	2	4	6	45	2					0.648
	21.3					32										
20	25	105	16	75	38	38	2.3	4	6	58	2					0.952
	26.9					40										
25	30	115	16	85	38	42	2.6	4	6	68	2					1.14
	33.7					45										
32	38	140	16	100	40	52	2.6	6	6	78	2					1.69
	42.4					56										
40	44.5	150	16	110	42	60	2.6	6	7	88	3					1.86
	48.3					64										
50	57	165	18	125	45	72	2.9	6	8	102	3					2.53
	60.3					75										
65	76.1	185	18	145	45	90	2.9	6	10	122	3					3.06
80	88.9	200	20	160	50	105	3.2	8	10	138	3	4*/8	M 16	(⅝")	18	3.70
100	108	220	20	180	52	125	3.6	8	12	158	3					4.62
	114.3					131										
125	133	250	22	210	55	150	4	8	12	188	3	8				6.30
	139.7					156										
150	159	285	22	240	55	175	4.5	10	12	212	3		M 20	(¾")	23	7.75
	168.3					184										
175	191	315	24	270	60	208	5.4	10	12	242	3	8				10.0
	193.7					210										
200	216	340	24	295	62	232	5.9	10	16	268	3		M 20	(¾")	23	11.0
	219.1					235										
250	267	405	26	355	70	285	6.3	12	16	320	3	12				15.6
	273					292										
300	318	460	28	410	78	338	7.1	12	16	378	4		M 24	(⅞")	27	22.0
	323.9					344										
350	355.6	520	30	470	82	390	8	12	16	438	4	16				
	368															28.7
400	406.4	580	32	525	85	445	8	12	16	490	4		M 27	(1")	30	
	419															36.3
500	508	715	34	650	90	548	8	12	16	610	4	20	M 30	(1 ⅛")	33	
	521															59.3
600	609.6	840	36	770	95	652	8.8	12	18	725	5		M 33	(1 ⅛")	36	
	622															73.4
700	711.2	910	36	840	100	755	8.8	12	18	795	5	24				
	720															75.0
800	812.8	1025	38	950	105	855	10	12	20	900	5		M 36	(1 ⅜")	39	
	820															99.0
900	914.4	1125	40	1050	110	955	.10	12	20	1000	5	28				
	920															119
1000	1016	1255	42	1170	120	1058	10	16	22	1115	5		M 39	(1 ½")	42	
	1020															159

* 4 bolts for ND 10 (nominal pressure) the order than reeds welding neck flange 80/88.9 ND 10 Din 2633

DIN 2634
Welding Neck Flanges for Nominal Pressure 25

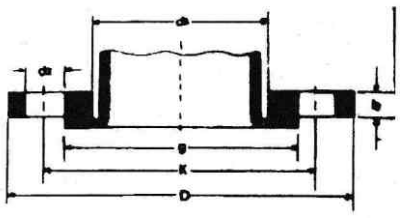
Pipe		Flange				Neck				Raised face		Bolts				Weight of one Flange 7.85 kg / dm3) kg
NW	d_1	D	b	k	h_1	d_3	s	-s	h_2	d_2	f	No.	Thread		d_2	
175	(191) 193.7	330	26	280	75	215 218	5.6	10	15	248	3	12	M 24	(7/8")	27	13.4
200	216 219.1	360	30	310	80	240 244	6.3	10	16	278	3					17.0
250	267 273	425	32	370	88	292 298	7.1	12	18	335	3		M 27	(1")	30	24.4
300	318 323.9	485	34	430	92	345 352	8	12	18	395	4	16				31.2
350	355.6 368	555	38	490	100	398	8	12	20	450	4		M 30	(1 ⅛")	33	45.0
400	406.4 419	620	40	550	110	452	8.8	12	20	505	4					58.7
500	508 521	730	44	660	125	558	10	12	20	615	4		M 33	(1 ¼")	36	86.1
600	609.6 622	845	46	770	125	660	11	12	20	720	5	20	M 36	(1 ⅜")	39	101

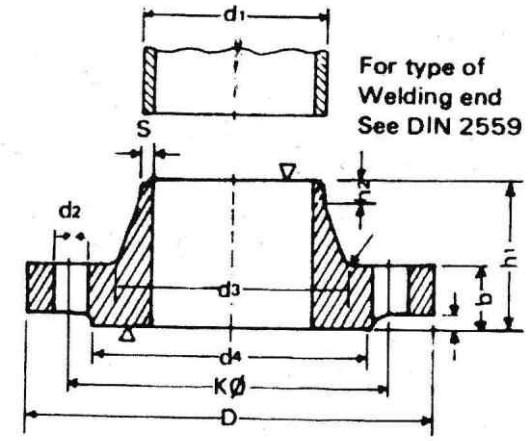


Notes: For Nominal Sizes 10 upto 150 See DIN-2635.

Loose Flange for Flange Collar PN 10
(DIN 2642, DIN Connections)

Nom Pipe Size	Flange D mm	d5 mm	b mm	r mm	k mm	Drilling Number	d2 mm	weight kg	Collar g mm
10	90	16	16	5	60	4	15	0.23	45
15	95	23	16	5	65	4	15	0.26	50
20	105	28	16	5	75	4	15	0.30	60
25	115	33	16	5	85	4	15	0.37	70
32	140	42	16	5	100	4	18	0.54	82
40	150	50	16	5	110	4	18	0.59	92
50	165	62	18	5	125	4	18	0.80	107
65	185	81	18	5	145	4	18	0.90	127
80	200	94	20	5	160	4	18	1.28	142
100	220	113	20	5	180	8	18	1.37	162
125	250	138	22	6	210	8	18	1.78	192
150	285	164	22	6	240	8	22	2.27	218
175	315	195	24	6	270	8	22	2.90	248
200	340	222	24	7	295	8	22	3.16	273
250	395	273	26	7	350	12	22	4.22	328
300	445	324	26	7	400	12	22	4.80	378
350	505	374	26	8	460	16	22	5.85	438
400	565	426	32	8	515	16	25	8.45	490
450	615	475	32	8	565	20	25	9.45	540
500	670	530	34	8	620	20	25	11.35	595
600	780	630	36	10	725	20	30	15.30	695
700	895	730	40	10	840	24	30	21.40	810
800	1015	832	44	10	950	24	34	30.50	916





DIN 2635
Welding Neck Flanges for Nominal Pressure 40

Pipe		Flange				Neck				Raised face		Bolts			d2	Weight of one Flange 7.85 kg / Dm3) kg
NW	d1	D	b	k	h1	d3	s	r	h2	d4	f	No.	Thread			
10	14	90	16	60	35	25	1.8	4	6	40	2	4	M 12	(½")	14	0.661
	17.2					28										
15	20	95	16	65	38	30	2	4	6	45	2					0746
	21.3					32										
20	25	105	18	75	40	38	2.3	4	6	58	2					1.06
	26.9					40										
25	30	115	18	85	40	42	2.6	4	6	68	2					1.29
	33.7					46										
32	38	140	18	100	42	52	2.6	6	6	78	2		M 16	(⅝")	18	1.88
	42.4					56										
40	44.5	150	18	110	45	60	2.6	6	7	88	3					2.33
	48.3					64										
50	57	165	20	125	48	72	2.9	6	8	102	3					2.82
	60.3					75										
65	76.1	185	22	145	52	90	2.9	6	10	122	3	8				3.74
80	88.9	200	24	160	58	105	3.2	8	12	138	3					4.75
100	108	235	24	190	65	128	3.6	8	12	162	3		M 20	(¾")	23	6.52
	114.3					134										
125	133	270	26	220	68	155	4	8	12	188	3	8	M 24	(⅞")	27	9.07
	139.7					162										
150	159	300	28	250	75	182	4.5	10	12	218	3					11.8
	168.3					192										
175	191	350	32	295	82	215	5.6	10	15	260	3	12	M 27	(1")	30	18.2
	193.7					218										
200	216	375	34	320	88	240	6.3	10	16	285	3					21.5
	219.1					244										
250	267	450	38	385	105	298	7.1	12	18	345	3		M 30	(1 ⅛")	33	34.9
	273					306										
300	318	515	42	450	115	352	8	12	18	410	4	16				
	323.9					362										49.7
350	355.6	580	46	510	125	408	8.8	12	20	460	4		M 33	(1 1/4")	36	
	368															68.1
400	406.4	660	50	585	135	462	11	12	20	535	4		M 36	(1 ⅜")	39	
	419															96.5
500	508	755	52	670	140	562	14.2	12	20	615	4	20	M 39	(1 ½")	42	
	521															1117

B.S. 10 Table 'D'

Nominal Pipe Size (in mm)	Diameter of Flange	Diameter of Bolt Circle (PCD)	Number of Bolts	Diameter of Bolts	Thickness of Flange
mm	mm	mm	mm	mm	mm
15	95	67	4	13	5
20	102	73	4	13	5
25	114	83	4	13	5
32	121	87	4	12	6
40	133	98	4	13	6
50	152	114	4	16	8
65	165	127	4	16	8
80	184	145	4	16	10
100	216	178	4	16	10
125	254	210	8	16	13
150	279	235	8	16	13
200	337	292	8	16	13
250	406	356	8	19	16
300	457	406	12	19	16
350	527	470	12	22	19
400	578	521	12	22	19
450	641	584	12	22	22
500	705	641	16	22	25
600	826	756	16	25	29

B.S. 10 Table 'F'

Nominal Pipe Size (in mm)	Diameter of Flange	Diameter of Bolt Circle (PCD)	Number of Bolts	Diameter of Bolts	Thickness of Flange
mm	mm	mm	mm	mm	mm
15	95	67	4	13	10
20	102	73	4	13	10
25	121	87	4	16	10
32	133	98	4	16	13
40	140	105	4	16	13
50	165	127	4	16	16
65	184	145	8	16	16
80	203	165	8	16	16
100	229	191	8	16	19
125	279	235	8	19	22
150	305	260	12	19	22
200	368	324	12	19	25
250	432	381	12	22	25
300	489	438	16	22	29
350	552	495	16	25	32
400	610	552	20	25	32
450	673	610	20	29	35
500	737	673	24	29	38
600	851	781	24	32	38

B.S. 10 Table 'E'

Nominal Pipe Size (in mm)	Diameter of Flange	Diameter of Bolt Circle (PCD)	Number of Bolts	Diameter of Bolts	Thickness of Flange
mm	mm	mm	mm	mm	mm
15	95	67	4	13	6
20	102	73	4	13	6
25	114	83	4	13	7
32	121	87	4	13	8
40	133	98	4	13	9
50	152	114	4	16	10
65	165	127	4	16	10
80	184	145	4	16	11
100	216	178	8	16	13
125	254	210	8	16	14
150	279	235	8	19	17
200	337	292	8	19	19
250	406	356	12	19	22
300	457	406	12	22	25
350	527	470	12	22	25
400	578	521	12	22	25
450	641	584	16	22	29
500	705	641	16	22	32
600	826	756	16	25	38

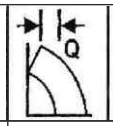
B.S. 10 Table 'H'

Nominal Pipe Size (in mm)	Diameter of Flange	Diameter of Bolt Circle (PCD)	Number of Bolts	Diameter of Bolts	Thickness of Flange
mm	mm	mm	mm	mm	mm
15	114	83	4	16	13
20	114	83	4	16	13
25	121	87	4	16	14
32	133	98	4	16	17
40	140	105	4	16	17
50	165	127	4	16	19
65	184	145	8	16	19
80	203	165	8	16	22
100	229	191	8	16	25
125	279	235	8	19	29
150	305	260	12	19	29
200	368	324	12	19	32
250	432	381	12	22	35
300	489	438	16	22	38
350	552	495	16	25	41
400	610	552	20	25	44
450	673	610	20	29	48
500	737	673	24	29	51
600	851	781	24	32	57

DIMENSION OF TOLERANCE IN INSPECTION

BUTT WELD FITTINGS TO ANSI 16.9 AND 16.28

All Dimension are in inch

ALL FITTINGS						90° and 45° Elbow and Tees	Reducer F	180° Returns			Caps
Nominal Pipe Size	Outside Diameter of Bevel	Inside Diameter of End	Wall Thickness T	ANGULARITY Off Angle Q	Off Plane P	Centre to End Dimention A.B.C.	Over All Length H	Centre to Centre Dimention 0	Bank Face Dimention K	Alignment of Ends U	Over All Length E
½ to 2½	+1/16-1/32	±1/32	Not Less than 87.5% of Normal Thickness	1/32	1/16	±1/16	±1/16	±1/4	±1/4	±1/32	±1/8
3 to 3 ½	± 1/16	±1/16		1/32	1/16	±1/16	±1/16	±1/4	±1/4	±1/32	±1/8
4	±1/16	±1/16		1/32	1/16	±1/16	±1/16	±1/4	±1/4	±1/32	±1/8
5 to 8	±3/32-1/16	±1/16		1/16	1/8	±1/16	±1/16	±1/4	±1/4	±1/32	±/1/4
10 to 12	+5/32-1/8	±1/8		3/32	3/16	±1/32	±3/32	±3/8	±1/4	±1/16	±1/4
14 to 16	+5/32-1/8	±1/8		3/32	1/4	±1/32	±3/32	±3/8	±1/4	±1/16	±1/4
18	+5/32-1/8	±1/8		1/8	1/4	±1/32	±3/32	±3/8	±1/4	±1/16	±1/4
20 to 24	+1/4-3/16	±3/16		1/8	3/8	±3/32	±3/32	±3/8	±1/4	±1/16	±1/4
30	+1/4-3/16	±3/16				±1/8	±3/16				±3/8
36	±1/4-3/16	±3/16				±3/16	±3/16				±3/8

SOCKET WELD FITTING TO ASA B 16.11 AND BS 3799

Nominal Bore	Elbows, tees Crosses	Coupling	Half Coupling	All Fitting				
	Centre to Bottom of socket	Bottom to Bottom of socket	Bottom to Socket to Opposite face	Bore Diameter of Socket	Bore Diameter of fitting	Fitting wall thickness	Concentricity of bores	Coincidence of axes
1/4 & 3/8	± 0.03	± 0.06	± 0.03	± 0.10	± 0.015	Not Less than nominal Pipe Wall Thickness	Socket and fitting bores within ± 0.030	0.062 in 12 inch
1/2 & 3/4	± 0.06	± 0.12	± 0.6					
1 to 2	± 0.08	± 0.16	± 0.8					

SCREWED FITTINGS TO ASA B 16.11 AND BS 3799

Nominal Bore	Elbows, tees Crosses		Street Elbows		Coupling Half Coupling		Bushing - Plugs					Unions	
	Centre to End	Diameter of bead	Centre to female end	Diameter of bead	Centre to male end	Overall Length	Diameter	Height of head	Length under head	Across flat	Overall Length	Overall Length	Across flat
1/2 & 3/4	±0.031	±0.062 -0.031	±0.031	±0.062 -0.031	±0.062	±0.062	±0.062 -0	±0.031	±0.062	+0 -0.031	±0.062	±0.062	+0 -0.031
1 to 3	±0.062	±0.093 -0.062	±0.062	±0.093 -0.062	±0.093	±0.125	±0.093 -0	±0.062	±0.093	+0 -0.062	±0.093	±0.125	+0 -0.062

WEIGHT OF RODS IN KILOGRAMS PER LINER FOOT

Size			Brass			Aluminium			Stainless Steel		
In	Fraction of in.	m.m.	Round	Hex	Sq.	Round	Hex	Sq.	Round	Hex	Sq.
1	2	3	4	5	6	7	8	9	10	11	12
1/8”	0.125	3.173	0.020	0.023	0.026	-	-	-	-	-	-
3/16”	0.187	4.762	0.046	0.051	0.059	0.015	0.017	0.020	0.043	0.047	0.054
1/4”	0.250	6.35	0.082	0.091	0.104	0.030	0.035	0.037	0.076	0.084	0.097
5/16”	0.312	7.937	0.129	0.142	0.164	0.042	0.047	0.054	0.119	0.132	0.151
3/8”	0.375	9.525	0.185	0.224	0.235	0.061	0.068	0.078	0.171	0.188	0.218
7/16”	0.437	11.112	0.252	0.278	0.321	0.083	0.092	0.106	0.233	0.257	0.296
1/2”	0.500	12.700	0.329	0.363	0.419	0.109	0.120	0.138	0.305	0.336	0.386
9/16”	0.562	14.287	0.416	0.461	0.529	0.138	0.152	0.175	0.384	0.424	0.490
5/8”	0.625	15.875	0.516	0.566	0.652	0.170	0.188	0.217	0.473	0.520	0.604
11/16”	0.687	17.462	0.621	0.684	0.789	0.206	0.227	0.262	0.587	0.647	0.760
3/4”	0.750	19.050	0.739	0.817	0.940	0.245	0.270	0.312	0.687	0.736	0.870
13/16”	0.812	20.637	0.867	0.958	1.104	0.287	0.317	0.366	0.800	0.882	1.021
7/8”	0.875	22.225	1.008	1.109	1.282	0.333	0.368	0.424	0.931	1.038	1.184
15/16”	0.937	23.812	1.154	1.273	1.474	0.383	0.422	0.486	1.067	1.176	1.359
1”	1.000	25.400	1.314	1.451	1.675	0.436	0.481	0.555	1.223	1.350	1.546
1.1/8”	1.125	28.575	1.665	1.834	2.122	0.553	0.608	0.705	1.569	1.730	1.956
1.1/4”	1.250	31.750	2.053	2.268	2.619	0.680	0.748	0.867	1.888	2.080	2.415
1.3/8”	1.375	34.925	2.487	2.742	3.167	0.821	0.907	1.082	2.318	2.554	2.922
1.1/2”	1.500	38.1	2.961	3.262	3.769	0.980	1.082	1.248	2.760	3.042	3.478
1.5/8”	1.625	41.450	3.742	3.833	4.426	1.152	1.272	1.466	3.205	3.540	4.072
1.3/4”	1.750	44.450	4.029	4.444	5.129	1.352	1.474	1.720	3.738	4.120	4.756
1.7/8”	1.875	47.625	4.627	5.101	5.890	1.529	1.692	1.942	4.300	4.740	5.475
2”	2.000	50.800	5.266	5.804	6.703	1.742	1.919	2.220	4.905	5.415	6.224
2.1/4”	2.250	57.150	6.662	7.346	8.482	2.204	2.433	2.802	6.210	6.850	7.910
2.1/2”	2.500	63.500	8.225	9.067	10.472	2.722	3.005	3.462	7.614	8.400	9.700
2.3/4”	2.750	69.850	10.199	11.225	12.955	3.003	3.315	3.820	9.282	10.220	11.820
3”	3.000	76.2	12.454	13.267	15.341	3.919	4.327	4.990	10.996	12.210	14.000
3.1/2”	3.500	88.900	16.364	18.040	20.824	5.408	5.970	6.884	14.946	16.500	19.020
4”	4.000	101.600	21.477	23.210	27.358	6.968	7.693	8.870	19.619	21.620	25.000

WEIGHT OF TUBES - WEIGHT IN KG. OF 16FT. LONG PIECE

Inch Ins. External Dia. 1	Fraction of in. 2	mm. 3	Copper		Brass	
			Wall Thickness 16 swg. 4	Wall Thickness 10 swg. 5	Wall Thickness 16 swg. 6	Wall Thickness 10 swg. 7
1/4”	0.250	6.350	1.0595	-	1.0088	-
5/16”	0.3125	7.938	1.4152	-	1.3426	-
3/8”	0.375	9.525	1.7635	2.830	1.6837	2.686
7/16”	0.4375	11.112	2.1047	3.556	2.0321	3.338
1/2”	0.500	12.700	2.4675	4.209	2.3224	3.992
9/16”	0.5625	14.288	2.8304	4.935	2.6853	4.717
5/8”	0.625	15.875	3.1933	5.661	3.0481	5.370
11/16”	0.6875	17.462	3.556	6.387	3.3384	6.024
3/4”	0.750	19.050	3.8464	7.040	3.7013	6.749
13/16”	0.8125	20.638	4.2090	7.765	4.064	7.403
7/8”	0.875	22.225	4.5722	8.491	4.354	8.056
15/16”	0.9375	23.812	4.9350	9.144	4.717	8.782
1”	1.000	25.400	5.297	9.870	5.0802	9.435
1.1/8”	1.125	28.575	5.951	11.249	5.733	10.813
1.1/4”	1.250	31.750	6.677	12.700	6.387	12.120
1.3/8”	1.375	34.925	7.402	14.079	7.112	13.499
1.1/2”	1.500	38.100	8.056	15.458	7.765	14.806
1.5/8”	1.625	41.275	8.782	16.910	8.419	16.811
1.3/4”	1.750	44.450	9.570	18.289	9.144	17.998
1.7/8”	1.875	47.625	10.160	19.668	9.797	18.869
2”	2.000	50.800	10.886	21.119	10.451	20.248
2.1/8”	2.125	53.975	11.612	22.498	11.176	21.627
2.1/4”	2.250	57.150	12.265	23.877	11.829	22.933
2.3/8”	2.375	60.325	12.991	25.329	12.483	24.312
2.3/4”	2.750	69.850	15.096	29.538	14.515	28.376

N.B. Wt. Aluminium Pipe Will be 33% of the Wt. of the Brass Pipe.

FORMULAE

For Calculating Weight of Brass & Copper Tubes

Measurement to be expressed in Inches

Brass Tubes. (70/30) Alloy)

(o.d-t)xtX5.284 = wt. in Kg.ft.

(o.d-t)xtX17.355 = Wt.in Kg./Metre.

o.d. = Outside Dia.
t=Thickness of tubes

Copper Tubes

(o.d.-t_xtX5.493 = Wt. in Kg./ft

(o.d-t_xtX18.005 = Wt. in Kg./Metre

WEIGHT & THIKNESS OF S.S. PIPES KG/PER FT. (GUG.)

Size	O.D. In. mm.	10G(3.25) [0.128"]	12G(2.64) [0.104"]	14G(2.03) [0.080"]	16G(1.62) [0.064"]	18G(1.21) [0.048"]	20G(0.91) [0.036"]	22G(0.71) [0.028"]
		WALL THIKNESS						
1/4"	6.35	0.075	0.070	0.065	0.058	0.046	0.037	0.030
5/16"	7.93	0.114	0.105	0.089	0.079	0.060	0.048	0.038
3/8"	9.52	0.152	0.135	0.113	0.097	0.080	0.058	0.046
1/2"	12.7	0.226	0.200	0.157	0.134	0.105	0.079	0.063
5/8"	15.87	0.360	0.280	0.245	0.180	0.132	0.101	0.080
3/4"	19.05	0.386	0.326	0.256	0.215	0.161	0.124	0.097
7/8"	22.25	0.465	0.390	0.310	0.252	0.192	0.145	0.113
1"	25.4	0.541	0.450	0.351	0.294	0.218	0.167	0.131
1.1/4"	31.750	0.696	0.580	0.448	0.375	0.275	0.200	0.162
1.1/2"	38.1	0.851	0.700	0.542	0.452	0.332	0.250	0.196
1.3/4"	44.45	1.020	0.832	0.646	0.530	0.390	0.294	0.230
2"	50.8	1.161	0.960	0.733	0.607	0.447	0.336	0.263
2.1/4"	57.15	1.315	1.085	0.828	0.687	0.504	-	-
2.1/2"	63.5	1.472	1.210	0.924	0.792	0.562	-	-
2.3/4"	69.85	1.630	1.338	1.022	0.847	0.619	-	-
3"	76.2	1.782	1.460	1.115	0.924	0.676	-	-
3.1/2"	88.9	2.092	1.718	1.306	1.082	0.791	-	-
4"	101.6	2.403	1.971	1.497	1.239	0.905	-	-
4.1/2"	114.3	2.713	2.224	1.608	1.397	1.020	-	-
5"	127.0	3.023	2.477	1.879	1.554	1.134	-	-
5.1/2"	139.7	3.336	2.730	2.070	1.713	1.250	-	-
6"	152.4	3.654	2.983	2.261	1.875	1.364	-	-
6.1/2"	165.1	3.975	3.256	2.452	2.028	1.478	-	-

WEIGHT & THIKNESS OF SCHEDULE PIPE

Nominal inch	BORE M/M O/D	Schedule 5 WT (KG/m) Kg/F		Schedule 10 WT (KG/m) Kg/F		Schedule 40 WT (KG/m) Kg/F		Schedule 80 WT (KG/m) Kg/F		Schedule 160 WT (KG/m) Kg/F	
1/8”	10.3	-	(0.276) -	1.24	(0.278) 0.084	1.73	(0.365) 0.112	2.41	(0.496) 0.143	-	- -
1/4”	13.7	1.24	(0.380) 0.116	1.65	(0.492) 0.150	2.24	(0.633) 0.194	3.02	(0.797) 0.243	-	- -
3/8”	17.2	1.24	(0.544) 0.167	1.65	(0.630) 0.192	2.31	(0.846) 0.260	3.20	(1.10) 0.335	-	- -
1/2”	21.3	1.65	(0.801) 0.245	2.11	(1.00) 0.306	2.77	(1.27) 0.388	3.75	(1.62) 0.498	4.75	(1.94) 0.594
3/4”	26.7	1.65	(1.02) 0.312	2.11	(1.27) 0.392	2.87	(1.68) 0.517	3.91	(2.20) 0.674	5.54	(2.89) 0.886
1”	33.4	1.65	(1.29) 0.396	2.77	(2.09) 0.641	3.38	(2.50) 0.767	4.55	(3.27) 0.992	6.35	(4.24) 1.29
1.1/4”	42.2	1.65	(1.65) 0.506	2.77	(2.69) 0.826	3.56	(3.38) 1.03	4.85	(4.46) 1.36	6.35	(5.61) 1.72
1.1/2”	48.3	1.65	(1.899) 0.582	2.77	(3.11) 0.953	3.68	(4.05) 1.24	5.08	(5.41) 1.66	7.1	(7.25) 2.22
2”	60.3	1.65	(2.39) 0.732	2.77	(3.937) 1.20	3.91	(5.44) 1.67	5.54	(7.48) 2.29	8.74	(11.09) 3.41
2.1/2”	73.0	2.11	(3.707) 1.13	3.05	(5.249) 1.61	5.16	(8.63) 2.65	7.01	(11.4) 3.50	9.53	(14.9) 4.57
3”	88.9	2.11	(4.528) 1.38	3.05	(6.463) 1.98	5.49	(11.3) 3.46	7.62	(15.3) 4.68	11.1	(21.3) 6.53
3.1/2”	101.6	2.11	(5.184) 1.59	3.05	(7.415) 2.27	5.74	(13.6) 4.16	8.08	(18.6) 5.71		
4”	114.3	2.11	(5.938) 1.79	3.05	(8.366) 2.57	6.02	(16.1) 4.93	8.56	(22.3) 6.84	13.5	(33.5) 10.2
5”	141.3	2.17	(9.35) 2.90	3.40	(11.61) 3.54	6.55	(21.8) 6.67	9.53	(31.0) 9.49	15.9	(49.2) 15.0
6”	168.3	2.77	(11.29) 3.47	3.40	(13.81) 4.24	7.11	(28.250) 8.66	11.0	(42.7) 13.0	18.24	(67.3) 20.6
8”	219.1	2.77	(14.80) 4.53	3.76	(20.01) 6.12	8.18	(42.7) 13.0	12.7	(64.6) 19.8	23.0	(111.2) 34.0
10”	273	3.40	(22.44) 6.93	4.19	(27.79) 8.51	9.27	(60.3) 18.4	15.1	(96.1) 29.4	28.6	(173.3) 52.8
12”	323.89	3.96	(31.43) 9.58	4.57	(36.0) 11.00	10.31	(79.71) 24.45	17.48	(132.1) 40.49	33.32	(240.1) 73.19
14”	355.6	3.96	(34.4) 10.5	4.78	(41.27) 12.67	11.13	(94.54) 29.0	19.05	(158.5) 48.350	35.71	(283.2) 86.300
16”	406.4	4.19	(41.6) 12.7	4.78	(14.51) 9.53	12.737.800	(123.29)	21.44	(203.53) 62.4	40.46	(367.1) 111.900
18”	457.2	4.19		4.76		9.52		12.7		-	
20”	508.00	4.76		5.54		9.52		12.7		-	

APPROX WEIGHT OF S.S. PATTA & PATTI

Width Size	Thk. (Wt. Per. Ft. In Kg.)								
	3mm	5mm	6mm	8mm	10mm	12mm	16mm	20mm	25mm
20mm	0.150	0.240	0.288	0.384	0.480	0.576	0.768	0.960	-
25mm	0.190	0.300	0.360	0.480	0.600	0.720	0.960	1.200	1.500
32mm	0.230	0.384	0.460	0.614	0.768	0.960	1.152	1.536	1.920
40mm	0.305	0.480	0.576	0.768	0.960	1.152	1.536	1.920	2.400
50mm	0.380	0.600	0.720	0.960	1.200	1.440	1.920	2.400	3.000
65mm	0.490	0.780	0.936	1.248	1.560	1.872	2.496	3.120	3.900
75mm	0.570	0.900	1.080	1.440	1.800	2.160	2.880	3.600	4.500
100mm	0.755	1.200	1.440	1.920	2.400	2.880	3.840	4.800	6.000

HARDNESS CONVERSION - GUIDANCE

HB	HV	HRs	HRc	HB	HV	HRs	HRc
118	125	68.5	-	269	284	-	27.6
121	127	70.0	-	275	292	-	28.7
123	130	71.0	-	285	301	-	29.9
126	132	72.0	-	295	310	-	31.0
128	135	73.0	-	302	319	-	32.1
131	137	74.0	-	312	329	-	33.2
134	140	75.0	-	321	339	-	34.3
137	143	76.5	-	331	350	-	35.4
140	147	77.5	-	341	360	-	36.6
143	150	78.5	-	352	372	-	37.8
146	153	79.5	-	363	383	-	39.1
149	156	81.0	-	375	396	-	40.4
152	159	82.0	-	388	410	-	41.8
156	163	83.0	-	402	425	-	43.1
159	167	84.0	-	415	440	-	44.5
163	171	85.0	-	430	457	-	45.8
166	175	86.0	-	444	474	-	47.2
170	178	87.0	-	-	495	-	48.7
175	183	88.0	-	-	516	-	50.3
179	188	89.0	-	-	535	-	51.4
183	192	90.0	-	-	553	-	52.5
187	196	90.5	-	-	560	-	53.0
192	202	91.5	-	-	577	-	54.0
197	207	93.0	-	-	595	-	55.0
202	212	93.5	-	-	613	-	56.0
207	218	94.5	-	-	633	-	57.0
212	222	95.5	-	-	653	-	58.0
217	228	96.5	-	-	674	-	59.0
229	234	97.5	19.0	-	697	-	60.0
229	241	98.0	20.5	-	720	-	61.0
235	247	99.0	21.6	-	746	-	62.0
241	253	100.0	22.8	-	772	-	63.0
248	261	101.0	24.1	-	800	-	64.0
255	269	-	25.4	-	832	-	65.0
262	276	-	26.5	-	-	-	-

WEIGHT PER STAINLESS STEEL SHEET

Thickness in mm	Sizes In mm			
	2000 X 1000	2500 X 1250	3000 X 1500	Width Kg/m2
0.18	2.88	-	-	1.44
0.20	3.20	-	-	1.60
0.22	3.52	-	-	1.76
0.24	3.84	-	-	1.92
0.27	4.32	-	-	2.16
0.28	4.48	-	-	2.24
0.32	5.12	-	-	2.56
0.38	6.08	-	-	3.04
0.44	7.04	11.00	-	3.52
0.50	8.00	12.50	-	4.00
0.56	8.96	14.00	-	4.48
0.63	10.08	15.75	-	5.04
0.75	12.00	18.75	-	6.00
0.88	14.08	22.00	-	7.04
1.00	16.00	25.00	36.00	8.00
1.13	18.08	28.25	40.00	9.04
1.25	20.00	31.25	45.00	10.00
1.38	22.08	34.50	50.00	11.04
1.50	24.00	37.50	54.00	12.00
1.75	28.00	43.75	63.00	14.00
2.00	32.00	50.00	72.00	16.00
2.25	36.00	56.25	81.00	18.00
2.50	40.00	62.50	90.00	20.00
2.75	44.00	68.75	99.00	22.00
3.00	48.00	75.00	108.00	24.00
3.25	52.00	81.25	117.00	26.00
3.50	56.00	87.50	126.00	28.00
3.75	60.00	93.75	135.00	30.00
4.00	64.00	100.00	144.00	32.00
4.25	68.00	106.25	153.00	34.00
4.50	72.00	112.50	162.00	36.00
5.00	80.00	125.00	180.00	40.00
5.50	88.00	137.50	198.00	44.00
6.00	96.00	150.00	216.00	48.00
6.50	104.00	162.50	234.00	52.00
7.00	112.00	175.00	252.00	56.00
7.50	120.00	187.50	270.00	60.00
8.00	128.00	200.00	288.00	64.00

APPROX WEIGHT S.S. CIRCLE

WEIGHT PER NO. IN KGS.

	4 MM	6 MM	8 MM	10 MM	12 MM	16 MM	20 MM	25 MM
20 MM	0.010	0.015	0.020	0.025	0.030	0.040	0.050	0.065
25 MM	0.016	0.250	0.350	0.400	0.500	0.650	0.800	0.100
32 MM	0.260	0.390	0.550	0.650	0.750	0.105	0.130	0.160
40 MM	0.040	0.060	0.080	0.100	0.120	0.160	0.200	0.250
50 MM	0.065	0.095	0.130	0.170	0.190	0.250	0.330	0.390
65 MM	0.105	0.160	0.215	0.265	0.320	0.430	0.530	0.660
75 MM	0.150	0.220	0.300	0.365	0.440	0.580	0.730	0.930
90 MM	0.205	0.305	0.405	0.510	0.615	0.810	1.015	1.270
100 MM	0.260	0.390	0.520	0.650	0.780	1.040	1.300	1.630
110 MM	0.300	0.455	0.608	0.760	0.910	1.210	1.520	1.890
125 MM	0.390	0.590	0.790	0.980	1.180	1.565	1.960	2.450
150 MM	0.565	0.850	1.130	1.410	1.690	2.250	2.815	3.520
175 MM	0.765	1.150	1.535	1.915	2.300	3.065	3.830	4.800
200 MM	1.000	1.500	2.000	2.500	3.000	4.000	5.000	6.250

APPROX WEIGHT OF S.S. SQUARE PIPE

SIZE	10 swg	14 swg	16 swg	18 swg	20 swg
1/2" x 1/2"	0.300	0.200	0.155	0.125	0.100
5/8 x 5/8	0.395	0.280	0.215	0.175	0.130
3/4 x 3/4"	0.510	0.355	0.270	0.220	0.165
1" x 1"	0.655	0.450	0.345	0.275	0.210
30 x 30	0.800	0.545	0.415	0.335	0.250
40 x 40	1.085	0.740	0.560	0.450	0.340
50 x 50	1.375	0.930	0.700	0.565	0.425
40 x 20	0.800	0.545	0.415	0.335	0.250
50 x 25	1.015	0.690	0.525	0.420	0.315
75 x 25	1.400	0.950	0.760	-	-
75 x 50	1.800	1.200	1.000	-	-
75 x 75	2.200	1.450	1.200	-	-
65 x 65	1.850	1.250	1.050	-	-
100 x 25	1.800	1.200	1.000	-	-
100 x 50	2.200	1.450	1.200	-	-
100 x 100	2.850	1.950	1.550	-	-

APPROX WEIGHT OF S.S. CAPSULE PIPE PER FT.

SIZE	14 swg	16 swg	18 swg	20 swg
25 x 12	0.260	0.210	0.165	0.135
35 x 12	0.350	0.265	0.220	0.195
35 x 16	0.460	0.330	0.250	0.220

APPROXIMATE WEIGHT OF COPPER AND BRASS SHEETS (SIZE 14"x 48")

S.W.G	Decimal inches	mm	Copper wt/sheet Kgs.	Brass wt/sheet kgs.	S.W.G.
3 swg	.250	6.35	24.520	23.320	3
6 swg	.190	4.8	18.390	17.490	6
8 swg	.160	4.00	15.670	14.920	8
10 swg	.128	3.251	12.540	11.940	10
12 swg	.104	2.642	10.180	9.700	12
14 swg	.080	2.032	7.840	7.460	14
16 swg	.063	1.6	6.130	5.830	16
18 swg	.048	1.22	4.700	4.480	18
20 swg	.036	.914	3.520	3.360	20
22 swg	.028	.711	2.740	2.610	22
24 swg	.022	.560	2.150	2.050	24
26 swg	.018	.457	1.760	1.680	26
28 swg	.015	.376	1.450	1.380	28
30 swg	.0124	.315	1.210	1.160	30
32 swg	.011	.274	1.060	1.000	32
34 swg	.009	.234	0.900	0.860	34
36 swg	.0076	.193	0.740	0.710	36
38 swg	.006	.152	0.590	0.560	38
40 swg	.0048	.122	0.470	0.450	40
42 swg	.004	.1016	0.390	0.370	42
44 swg	.0032	.0813	0.310	0.300	44

APPROX WEIGHT OF S.S ANGLE PER FT.

SIZE	3 mm	4 mm	5 mm	6 mm
20 x 20	0.290	0.385	-	-
25 x 25	0.360	0.480	0.600	0.720
30 x 30	0.430	0.575	0.720	0.865
35 x 35	0.500	0.670	0.850	1.000
40 x 40	0.575	0.770	0.960	1.220
50 x 50	0.720	0.960	1.200	1.500
65 x 65	0.940	1.250	1.560	1.870
75 x 75	1.100	1.440	1.800	2.160
100 x 100	1.450	1.990	2.400	2.880

WEIGHT OF ALUMINIUM ROUND PIPE 12' LONG

Size O.D.			Thickness / Weight of 12' in Kg.			
Inch	mm	1.22 mm.	1.63 mm.	2.0 mm.	3.20 mm.	5.00 mm.
1/2	12.70	0.450	0.530	0.670	1.050	-
5/8	15.88	0.570	0.750	0.950	1.250	-
3/4	19.05	0.720	0.870	1.100	1.600	-
7/8	22.22	0.800	1.050	1.300	2.000	-
1	25.40	0.900	1.200	1.470	2.200	-
1.1/8	28.88	1.050	1.400	1.670	2.500	-
1.1/4	31.75	1.200	1.500	1.860	2.850	-
1.3/8	35.00	1.350	1.800	2.200	3.150	4.650
1.1/2	38.10	1.450	1.900	2.250	3.800	5.000
1.3/4	45.10	-	2.000	2.650	4.000	6.200
2	50.80	-	2.400	3.000	4.800	6.900
2.1/4	57.15	-	2.700	-	5.350	-
2.1/2	63.50	-	3.200	4.500	6.300	-
3	76.20	-	4.250	-	8.200	-
3.1/2	88.60	-	4.800	-	9.400	-
4	101.60	-	4.500	-	11.00	-

APPROX, WEIGHT OF SHEETS IN KILOGRAM PER SQ. FT.

Inch	Thickness Gauge	Copper	Brass	Aluminium	Stainless Gauge	Steels Per Seq. Ft	Lead Sheet
1/4'	3	5.286	5.049	1.620	3	4.860	7.280
3/16'	6	4.027	3.846	1.210	6	3.630	5.460
5/32'	8.	3.356	3.209	1.026	8	3.080	
1/8'	10	2.685	2.567	0.810	10	2.430	3.640
	12.	2.181	2.083	0.660	12	1.980	
	14	1.678	1.602	0.505	14	1.515	2.730
1/16'	16	1.312	1.247	0.406	16	1.218	1.820
	18	1.006	0.961	0.305	18	0.915	
	20	0.755	0.722	0.230	20	0.690	0.910
	22	0.587	0561	0.180	22	0.540	
	24	0.461	0.441	0.140	24	0.418	
	26	0.377	0.361	0.115	26	0.350	
	28	0.310	0.299	0.090	28	0.295	
	30	0.260	0.249	0.080	30	0.220	
	32	0.226	0.216	0.070	32	0.185	

WEIGHT OF ALUMINIUM SHEET

SWG 1	Inch 2	Milli Meters 3	Kg sq./ Foot 4	Kg 8' x 4' 5	Kg 8' x 3' 6
3/8"	.375	9.53	2.399	76.740	57.540
3/0	.372	9.45	2.376	75.890	57.080
2/0	.348	8.84	2.227	71.210	53.430
1/0	.324	8.23	2.072	66.300	49.720
5/16"	.312	7.93	1.995	63.860	47.900
1	.300	7.62	1.918	61.370	46.630
2	.276	7.01	1.764	56.410	42.350
3	.252	6.40	1.610	51.560	38.690
1/4"	.250	6.35	1.596	51.166	38.380
4	.232	5.89	1.483	47.480	35.600
5	.212	5.38	1.356	43.370	32.510
6	.192	4.88	1.229	39.280	29.480
3/16"	.187	4.75	1.197	38.210	28.710
7	.176	4.47	1.125	36.600	27.410
8	.160	4.06	1.025	32.730	24.520
9	.144	3.66	0.921	29.480	22.080
10	.128	3.25	0.816	26.170	19.650
1/8"	.125	3.18	0.798	25.570	19.190
11	.116	2.95	0.744	23.720	17.830
12	.104	2.64	0.667	21.250	15.950
13	.092	2.34	0.590	18.810	14.090
14	.080	2.03	0.512	16.320	12.240
15	.072	1.83	0.462	14.730	11.050
16	.064	1.63	0.409	13.090	9.830
17	.056	1.42	0.359	11.480	8.610
18	.048	1.22	0.307	9.830	7.330
19	.040	1.02	0.225	8.160	6.116
20	.036	0.914	0.230	7.330	5.520
21	.032	0.813	0.205	6.520	4.490

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