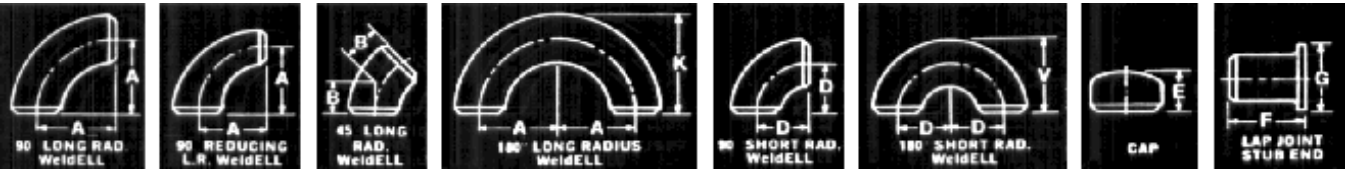
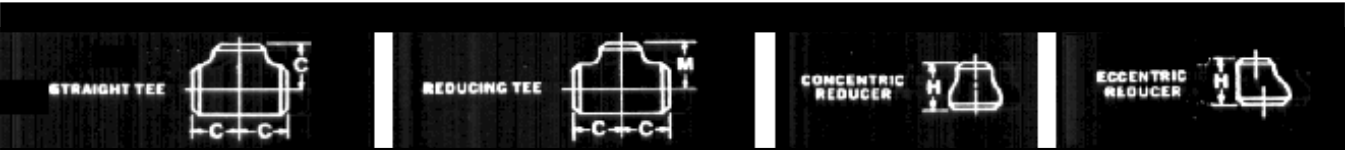


SEAMLESS WELDED FITTINGS



NPS	Pipe O.D.	WALL THICKNESS													A	B	K	D	V	E	F		G	NPS
		① Light Wall	SCH 20	SCH 30	② STD	SCH 40	SCH 60	③-SIG	SCH 80	SCH 100	SCH 120	SCH 140	SCH 160	XX Stg							ASA	MSS		
1/2	.840	.083	---	---	.109	.109	---	.147	.147	---	---	---	.188	.294	1 1/2	5/8	1 7/8	---	---	1	3	2	1 3/8	1/2
3/4	1.050	.083	---	---	.113	.113	---	.154	.154	---	---	---	.219	.308	1 1/8	7/16	1 11/16	---	---	1 1/2	3	2	1 11/16	3/4
1	1.315	.109	---	---	.133	.133	---	.179	.179	---	---	---	.250	.358	1 1/2	7/8	2 3/16	1	1 5/8	1 1/2	4	2	2	1
1 1/4	1.660	.109	---	---	.140	.140	---	.191	.191	---	---	---	.250	.382	1 7/8	1	2 3/4	1 1/4	2 1/16	1 1/2	4	2	2 1/2	1 1/4
1 1/2	1.900	.109	---	---	.145	.145	---	.200	.200	---	---	---	.281	.400	2 1/4	1 1/8	3 1/4	1 1/2	2 1/16	1 1/2	4	2	2 3/8	1 1/2
2	2.375	.109	---	---	.154	.154	---	.218	.218	---	---	---	.344	.436	3	1 3/8	4 3/16	2	3 3/16	1 1/2	6	2 1/2	3 3/8	2
2 1/2	2.875	.120	---	---	.203	.203	---	.276	.276	---	---	---	.375	.552	3 3/4	1 3/4	5 1/16	2 1/2	3 3/16	1 1/2	6	2 1/2	4 1/8	2 1/2
3	3.500	.120	---	---	.216	.216	---	.300	.300	---	---	---	.438	.600	4 1/2	2	6 1/4	3	4 3/4	2	6	2 1/2	5	3
3 1/2	4.000	.120	---	---	.226	.226	---	.318	.318	---	---	---	.636	.875	5 1/4	2 1/4	7 1/4	1 1/2	5 1/2	2 1/2	6	3	5 1/2	3 1/2
4	4.500	.120	---	---	.237	.237	---	.337	.337	---	.438	---	.531	.674	6	2 1/2	8 1/4	4	6 1/4	2 1/2	6	3	6 1/16	4
5	5.563	.134	---	---	.258	.258	---	.375	.375	---	.500	---	.625	.750	7 1/2	3 3/8	10 5/16	5	7 3/4	3	8	3	7 5/16	5
6	6.625	.134	---	---	.280	.280	---	.432	.432	---	.562	---	.719	.864	9	3 3/4	12 5/16	6	9 1/16	3 1/2	8	3 1/2	8 1/2	6
8	8.625	.148	.250	.277	.322	.322	.406	.500	.500	.594	.719	.812	.906	.875	12	5	16 5/16	8	12 5/16	4	8	4	10 5/8	8
10	10.750	.165	.250	.307	.365	.365	.500	.500	.594	.719	.844	1.000	1.125	1.000	15	6 1/4	20 3/8	10	15 5/8	5	10	5	12 3/4	10
12	12.750	.180	.250	.330	.375	.406	.562	.500	.688	.844	1.000	1.125	1.312	1.000	18	7 1/2	24 3/8	12	18 3/8	6	10	6	15	12
14	14.000	.250	.312	.375	.375	.438	.594	.500	.750	.938	1.094	1.250	1.406	---	21	8 3/4	28	14	21	6 1/2	12	---	16 1/4	14
16	16.000	.250	.312	.375	.375	.500	.656	.500	.844	1.031	1.219	1.438	1.594	---	24	10	32	16	24	7	12	---	18 1/2	16
18	18.000	.250	.312	.438	.375	.562	.750	.500	.938	1.156	1.375	1.562	1.781	---	27	11 1/4	36	18	27	8	12	---	21	18
20	20.000	.250	.375	.500	.375	.594	.812	.500	1.031	1.281	1.500	1.750	1.969	---	30	12 1/2	40	20	30	9	12	---	23	20
24	24.000	.250	.375	.562	.375	.688	.969	.500	1.219	1.531	1.812	2.062	2.344	---	36	15	48	24	36	10 1/2	12	---	27 1/4	24
30	30.000	.312	.500	.625	.375	---	---	.500	---	---	---	---	---	---	45	18 1/2	60	30	45	10 1/2	---	---	---	30
36⓪	36.000	.312	.500	.625	.375	.750	---	.500	---	---	---	---	---	---	54	22 1/4	---	36	54	10 1/2	---	---	---	36⓪
42⓪	42.000	---	---	---	.375	---	---	.500	---	---	---	---	---	---	63	26	---	48	---	12	---	---	---	42⓪



NPS	Outlet	C	M	H	NPS	Outlet	C	M	H	NPS	Outlet	C	M	H	NPS	Outlet	C	M	H
3/4	3/4	1 1/8	---	---	4	4	4 1/8	---	---	14	14	11	---	---	30	30	22	---	---
1	1 1/2	1 1/8	1 1/8	1 1/2		3 1/2	4 1/8	4	4		12	11	10 5/8	13		24	22	21	24
1 1/4	1	1 1/2	1 1/2	2		3	4 1/8	3 7/8	4		10	11	10 1/8	13		20	22	20	24
1 1/2	1 1/2	1 1/2	1 1/2	2		2 1/2	4 1/8	3 3/4	4		8	11	9 3/4	13		18	22	19 1/2	24
2	2	2	2	2		2	4 1/8	3 1/2	4		6	11	9 3/8	13		16	22	19	24
2 1/2	2 1/2	---	---	---	5	5	4 7/8	---	---	16	16	12	---	---	36	36	26 1/2	---	---
3	3	1 7/8	1 7/8	2		4	4 7/8	4 5/8	5		14	12	12	14		30	26 1/2	24	24
3 1/2	3 1/2	1 7/8	1 7/8	2		3 1/2	4 7/8	4 1/2	5		12	12	11 5/8	14		24	26 1/2	25	24
4	4	1 7/8	1 7/8	2		3	4 7/8	4 3/8	5		10	12	11 1/8	14		20	26 1/2	23	24
4 1/2	4 1/2	---	---	---		2 1/2	4 7/8	4 1/4	5		8	12	10 3/4	14		18	26 1/2	22 1/2	24
5	5	2 1/4	2 1/4	2 1/2	6	6	5 1/8	---	---	18	18	13 1/2	---	---	42	42	30	---	---
5 1/2	5 1/2	2 1/4	2 1/4	2 1/2		5	5 1/8	5 3/8	5 1/2		16	13 1/2	13	15		36	30	28	24
6	6	2 1/4	2 1/4	2 1/2		4	5 1/8	5 1/8	5 1/2		14	13 1/2	13	15		30	30	28	24
6 1/2	6 1/2	---	---	---		3 1/2	5 1/8	4 7/8	5 1/2		12	13 1/2	12 5/8	15		24	30	26	24
7	7	2 1/2	2 1/2	2 1/2		2 1/2	5 1/8	4 3/4	5 1/2		10	13 1/2	12 1/8	15		20	30	26	24
7 1/2	7 1/2	2 1/2	2 1/2	2 1/2	8	8	7	---	---	20	20	15	---	---	24	24	17	---	---
8	8	2 3/4	2 3/4	3		6	7	6 5/8	6		18	15	14 1/2	20		20	17	16 1/2	20
8 1/2	8 1/2	2 3/4	2 3/4	3		5	7	6 3/8	6		16	15	14	20		18	17	16	20
9	9	2 3/4	2 3/4	3		4	7	6 1/8	6		14	15	14	20		16	17	16	20
9 1/2	9 1/2	---	---	---		3 1/2	7	6 1/8	6		12	15	13 3/8	20		14	17	15 5/8	20
10	10	3	3	3 1/2	10	10	8 1/2	---	---	24	24	17	---	---	30	30	22	---	---
10 1/2	10 1/2	3 3/8	3 3/8	3 1/2		8	8 1/2	8	7		20	17	17	20		24	22	21	24
11	11	3 3/8	3 3/8	3 1/2		6	8 1/2	7 5/8	7		18	17	16 1/2	20		20	22	20	24
11 1/2	11 1/2	3 3/8	3 3/8	3 1/2		5	8 1/2	7 1/2	7		16	17	16	20		18	22	20	24
12	12	3 3/8	3 3/8	3 1/2		4	8 1/2	7 1/4	7		14	17	16	20		16	22	20	24
12 1/2	12 1/2	---	---	---	12	12	10	---	---	36	36	20	---	---	42	42	24	---	---
13	13	3 3/4	3 3/4	4		10	10	9 1/2	8		30	20	20	24		30	24	24	24
13 1/2	13 1/2	3 3/4	3 3/4	4		8	10	9	8		24	20	20	24		24	24	24	24
14	14	3 3/4	3 3/4	4		6	10	8 5/8	8		20	20	20	24		20	24	24	24
14 1/2	14 1/2	3 3/4	3 3/4	4		5	10	8 1/2	8		18	20	20	24		18	24	24	24

- NOTES:
1. Light Wall thicknesses are identical to stainless steel Schedule 10S in Sizes thru 12" and to Schedule 10 in sizes 14" and larger.
 2. Standard Wall thicknesses are identical to stainless steel Schedule 40S in sizes thru 12".
 3. Extra Strong Wall thicknesses are identical to stainless steel Schedule 80S in sizes thru 12".
 4. May be of welded pipe, x-rayed and stress-relieved.
 5. Other types, sizes and thicknesses of fittings on application.
 6. Stocked in carbon steel and a variety of other metals and alloys.

FORGED STEEL FLANGES



150 LB. FLANGES								300 LB. FLANGES								400 LB. FLANGES							
NPS	O	C ^②	Weld Neck	Slip On Thrd.	Y ^③ Lap Joint	Bolt Circle	No. and Size of Holes	O	C ^②	Weld Neck	Y ^③ Lap Joint	Lap Joint	Bolt Circle	No. and Size of Holes	O	C ^②	Weld Neck	Slip On Thrd.	Y ^③ Lap Joint	Bolt Circle	No. and Size of Holes	Nom. Pipe Size	
1/2	3 1/2	7/16	1 7/8	5/8	5/8	2 3/8	4 - 5/8	3 3/4	9/16	2 1/16	7/8	1	2 5/8	4 - 5/8	3 3/4	9/16	2 1/16	7/8	1	2 5/8	4 - 5/8	1/2	
3/4	3 3/8	1/2	2 1/16	5/8	5/8	2 3/4	4 - 5/8	4 5/8	5/8	2 1/4	1	1	3 1/4	4 - 3/4	4 5/8	5/8	2 1/4	1	1	3 1/4	4 - 3/4	3/4	
1	4 1/4	9/16	2 3/16	1 1/16	1 1/16	3 3/8	4 - 5/8	4 7/8	1 1/16	2 7/16	1 1/16	1 1/16	3 1/2	4 - 3/4	4 7/8	1 1/16	2 7/16	1 1/16	1 1/16	3 1/2	4 - 3/4	1	
1 1/4	4 5/8	5/8	2 1/4	1 3/16	1 3/16	3 1/2	4 - 5/8	5 1/4	3/4	2 9/16	1 1/16	1 1/16	3 3/8	4 - 3/4	5 1/4	1 3/16	2 5/8	1 1/16	1 1/8	3 3/8	4 - 3/4	1 1/4	
1 1/2	5	1 1/16	2 1/16	7/8	7/8	3 3/8	4 - 5/8	6 1/8	1 3/16	2 1 1/16	1 3/16	1 3/16	4 1/2	4 - 7/8	6 1/8	7/8	2 3/4	1 1/4	1 1/4	4 1/2	4 - 7/8	1 1/2	
2	6	3/4	2 1/2	1	1	4 1/4	4 - 3/4	6 1/2	7/8	2 3/4	1 5/16	1 5/16	5	8 - 3/4	6 1/2	1	2 7/8	1 1/8	1 1/16	5	8 - 3/4	2	
2 1/2	7	7/8	2 3/4	1 1/8	1 1/8	5 1/2	4 - 3/4	7 1/2	1	3	1 1/2	1 1/2	5 5/8	8 - 7/8	7 1/2	1 1/8	3 3/8	1 5/8	1 5/8	5 5/8	8 - 7/8	2 1/2	
3	7 1/2	1 5/16	2 3/4	1 3/16	1 3/16	6	4 - 3/4	8 1/2	1 1/8	3 3/8	1 1 1/16	1 1 1/16	6 5/8	8 - 7/8	8 1/4	1 1/4	3 3/4	1 1 3/16	1 1 3/16	6 5/8	8 - 7/8	3	
3 1/2	8 1/2	1 5/16	2 13/16	1 1/4	1 1/4	7	8 - 3/4	9	1 3/16	3 3/16	1 3/4	1 3/4	7 1/4	8 - 7/8	9	1 3/8	3 3/8	1 1 5/16	1 1 5/16	7 1/4	8 - 1	3 1/2	
4	9	1 5/16	3	1 5/16	1 5/16	7 1/2	8 - 3/4	10	1 1/4	3 3/8	1 7/8	1 7/8	7 1/8	8 - 7/8	10	1 3/8	3 3/2	2	2	7 1/8	8 - 1	4	
5	10	1 5/16	3 1/2	1 7/16	1 7/16	8 1/2	8 - 7/8	11	1 3/8	3 3/8	2	2	9 1/4	8 - 7/8	11	1 1/2	4	2 1/8	2 1/8	9 1/4	8 - 1	5	
6	11	1	3 1/2	1 9/16	1 9/16	9 1/2	8 - 7/8	12 1/2	1 7/16	3 3/8	2 1/16	2 1/16	10 5/8	12 - 7/8	12 1/2	1 5/8	4 1/16	2 1/8	2 1/4	10 5/8	12 - 1	6	
8	13 1/2	1 1/8	4	1 3/4	1 3/4	11 3/4	8 - 7/8	15	1 5/8	4 1/8	2 3/16	2 3/16	13	12 - 1	15	1 7/8	4 5/8	2 1 1/16	2 1 1/16	13	12 - 1 1/8	8	
10	16	1 1/4	4	1 5/8	1 5/8	14 1/4	12 - 1	17 1/2	1 7/8	4 5/8	2 5/8	3 3/4	15 1/4	16 - 1 1/8	17 1/2	2 1/8	4 3/8	2 7/8	4	15 1/4	16 - 1 1/4	10	
12	19	1 1/4	4 1/2	2 1/16	2 1/16	17	12 - 1	20 1/2	2	5 1/8	2 7/8	4	17 3/4	16 - 1 1/4	20 1/2	2 1/4	5 3/8	3 3/8	4 1/4	17 3/4	16 - 1 3/8	12	
14	21	1 5/8	5	2 1/4	3 3/8	18 3/4	12 - 1 1/8	23	2 1/8	5 5/8	3	4 3/8	20 1/4	20 - 1 1/4	23	2 3/8	5 7/8	3 3/16	4 5/8	20 1/4	20 - 1 3/8	14	
16	23 1/2	1 7/16	5	2 1/2	3 3/16	21 3/4	16 - 1 1/8	25 1/2	2 1/4	5 7/8	3 1/4	4 3/4	22 1/2	20 - 1 3/8	25 1/2	2 1/2	6	3 1 1/16	5	22 1/2	20 - 1 1/2	16	
18	25	1 3/16	5 1/2	2 1 1/16	3 13/16	22 3/4	16 - 1 1/4	28	2 3/8	6 1/4	3 1/2	5 1/8	24 3/4	24 - 1 3/8	28	2 5/8	6 1/2	3 3/8	5 5/8	24 3/4	24 - 1 1/2	18	
20	27 1/2	1 1/8	5 1 1/16	2 1/4	4 1/16	25	20 - 1 1/4	30 1/2	2 1/2	6 3/4	3 3/4	5 1/2	27	24 - 1 3/4	30 1/2	2 3/4	6 5/8	4	5 1/4	27	24 - 1 5/8	20	
24	32	1 7/8	6	3 1/4	4 3/8	29 1/2	20 - 1 3/8	36	2 3/4	6 5/8	4 3/16	6	32	24 - 1 5/8	36	3	6 7/8	4 1/2	6 1/4	32	24 - 1 7/8	24	
30	38 3/4	2 1/8	5 5/8	3 1/2	---	36	28 - 1 3/8	43	3 3/8	8 1/4	8 1/4	---	39 1/4	28 - 1 7/8	43	4	8 5/8	8 5/8	---	39 1/4	28 - 2 1/8	30	
36	46	2 3/8	5 3/8	3 3/4	---	42 3/4	32 - 2 1/8	50	4 1/8	9 1/2	9 1/2	---	46	32 - 2 1/2	50	4 1/2	9 7/8	9 7/8	---	46	32 - 2 1/8	36	

600 LB. FLANGES								900 LB. FLANGES								1500 LB. FLANGES							
1/2	3 3/4	9/16	2 1/16	7/8	7/8	2 5/8	4 - 5/8	4 3/4	7/8	2 5/8	1 1/4	1 1/4	3 3/4	4 - 7/8	4 3/4	7/8	2 5/8	1 1/4	1 1/4	3 3/4	4 - 7/8	1/2	
3/4	4 5/8	5/8	2 1/4	1	1	3 3/4	4 - 3/4	5 5/8	1	2 3/4	1 3/8	1 3/8	3 3/2	4 - 7/8	5 5/8	1 1/8	2 3/4	1 3/8	1 3/8	3 3/2	4 - 7/8	3/4	
1	4 7/8	1 1/16	2 1/16	1 1/16	1 1/16	3 1/2	4 - 3/4	5 7/8	1 1/8	2 1/8	1 5/8	1 5/8	4	4 - 1	5 7/8	1 1/8	2 1/8	1 5/8	1 5/8	4	4 - 1	1	
1 1/4	5 1/4	1 3/8	2 5/8	1 1/8	1 1/8	3 7/8	4 - 3/4	6 1/8	1 1/8	2 1/8	1 5/8	1 5/8	4 3/8	4 - 1	6 1/4	1 1/8	2 1/8	1 5/8	1 5/8	4 3/8	4 - 1	1 1/4	
1 1/2	6 1/8	7/8	2 3/4	1 1/4	1 1/4	4 1/2	4 - 7/8	7	1 1/4	3 1/4	1 3/4	1 3/4	4 7/8	4 - 1 1/8	7	1 1/4	3 1/4	1 3/4	1 3/4	4 7/8	4 - 1 1/8	1 1/2	
2	6 1/2	1	2 5/8	1 1/16	5	8 - 3/4		8 1/2	1 1/2	4	2 1/4	2 1/4	6 1/2	8 - 1	8 1/2	1 1/2	4	2 1/4	2 1/4	6 1/2	8 - 1	2	
2 1/2	7 1/2	1 1/8	3 3/8	1 5/8	5 5/8	8 - 7/8		9 5/8	1 5/8	4 1/8	2 1/2	2 1/2	7 1/2	8 - 1 1/8	9 5/8	1 5/8	4 1/8	2 1/2	2 1/2	7 1/2	8 - 1 1/8	2 1/2	
3	8 1/4	1 1/4	3 1/4	1 3/16	6 5/8	8 - 7/8		9 1/2	1 1/2	4	2 1/8	1 1/8	7 1/2	8 - 1	10 1/2	1 7/8	4 3/8	2 7/8	2 7/8	8	8 - 1 1/4	3	
3 1/2	9	1 3/8	3 3/8	1 5/16	7 1/4	8 - 1		---	---	---	---	---	---	---	---	---	---	---	---	---	---	3 1/2	
4	10 3/4	1 1/2	4	2 1/8	8 1/2	8 - 1		11 1/2	1 3/4	4 1/2	2 3/4	2 3/4	9 1/4	8 - 1 1/4	12 1/4	2 1/8	4 7/8	3 3/16	3 3/16	9 1/2	8 - 1 3/8	4	
5	13	1 3/4	4 1/2	2 3/8	2 9/16	8 - 1 1/8		13 3/4	2	5	3 1/8	3 1/8	11	8 - 1 3/8	14 1/4	2 7/8	6 3/8	4 1/8	4 1/8	11 1/2	8 - 1 5/8	5	
6	14	1 7/8	4 5/8	2 5/8	2 5/8	11 1/2	12 - 1 1/8	15	2 1/16	5 1/2	3 3/8	3 3/8	12 1/2	12 - 1 1/4	15 1/2	3 3/4	6 3/4	4 1 1/16	4 1 1/16	12 1/2	12 - 1 1/2	6	
8	16 1/2	2 1/16	5 1/4	3	3	13 3/4	12 - 1 1/4	18 1/2	2 1/2	6 1/8	4	4 1/2	15 1/2	12 - 1 1/8	19	3 3/8	8 3/8	5 5/8	5 5/8	15 1/2	12 - 1 3/4	8	
10	20	2 1/2	6	3 3/8	4 3/8	17	1 - 1 3/8	21 1/2	2 3/4	7 1/4	4 1/4	5	18 1/2	16 - 1 1/2	23	4 1/4	10	6 1/4	7	19	12 - 2	10	
12	22	2 5/8	6 1/8	3 3/8	4 5/8	19 1/4	20 - 1 3/8	24	3 1/8	7 1/8	4 5/8	5 1/8	21	20 - 1 1/2	26 1/2	4 3/8	11 1/8	7 1/8	8 5/8	22 1/2	16 - 2 1/4	12	
14	23 3/4	2 3/4	6 1/2	3 1 1/16	5	20 - 1 1/2		25 1/4	3 3/8	8 1/8	5 1/8	6 1/8	22	20 - 1 5/8	29 1/2	5 1/4	11 3/4	---	9 1/2	25	16 - 2 3/8	14	
16	27	3	7	4 3/16	5 1/2	20 3/4	20 - 1 5/8	27 3/4	3 1/2	8 1/2	5 1/4	6 1/2	24 1/4	20 - 1 3/4	32 1/2	5 3/4	12 1/4	---	10 1/4	27 3/4	16 - 2 5/8	16	
18	29 1/4	3 1/4	7 1/4	4 5/8	6	25 3/4	20 - 1 3/4	31	4	9	6	7 1/2	27	20 - 2	36	6 3/8	12 7/8	---	10 7/8	30 1/2	16 - 2 3/4	18	
20	32	3 1/2	7 1/2	5	6 1/2	28 1/2	24 - 1 1/4	33 3/4	4 1/4	9 3/4	6 1/4	8 1/4	29 1/2	20 - 2 1/8	38 3/4	7	14	---	11 1/2	32 1/4	16 - 3 1/8	20	
24	37	4	8	5 1/2	7 1/4	33	24 - 2	41	5 1/2	11 1/2	8	10 1/2	35 1/2	20 - 2 5/8	46	8	16	---	13	39	16 - 3 3/4	24	
30	44 1/2	4 1/2	9 3/4	---	---	40 1/4	28 - 2 1/8	48 1/2	5 7/8	12 1/4	12 1/4	---	42 3/4	20 - 3 1/8	---	---	---	---	---	---	---	---	30
36	51 3/4	4 7/8	11 1/8	---	---	47 1/4	28 - 2 5/8	57 1/2	6 3/4	14 1/4	14 1/4	---	50 3/4	20 - 3 5/8	---	---	---	---	---	---	---	---	36

2500 LB. FLANGES							
1/2	5 1/4	1 3/16	2 7/8	1 9/16	1 9/16	3 1/2	4 - 7/8
3/4	5 1/2	1 1/4	3 1/8	1 11/16	1 11/16	3 3/4	4 - 7/8
1	6 1/4	1 3/8	3 1/2	1 7/8	1 7/8	4 1/4	4 - 1
1 1/4	7 1/4	1 1/2	3 3/4	2 1/16	2 1/16	5 1/8	4 - 1 3/8
1 1/2	8	1 3/4	4 3/8	2 3/8	2 3/8	5 3/4	4 - 1 1/4
2	9 1/4	2	5	2 3/4	2 3/4	6 3/4	8 - 1 1/8
2 1/2	10 1/2	2 1/4	5 5/8	3 1/8	3 1/8	7 3/4	8 - 1 1/4
3	12	2 5/8	6 5/8	3 5/8	3 5/8	9	8 - 1 3/8
4	14	3	7 1/2	4 1/4	4 1/4	10 3/4	8 - 1 5/8
5	16 1/2	3 3/8	9	5 1/8	5 1/8	12 3/4	8 - 1 7/8
6	19	4 1/4	10 3/4	6	6	14 1/2	8 - 2 1/8
8	21 3/4	5	12 1/2	7	7	17 1/4	12 - 2 1/8
10	26 1/2	6 1/2	16 1/2	9	9	21 1/4	12 - 2 3/8
12	30	7 1/4	18 1/4	10	10	24 3/8	12 - 2 7/8

WELDING NECK FLANGE BORES ① ②														
NPS	Outside Diam.	Light Wall	Sched. 20	Sched. 30	Double Std. Wall	Sched. 40	Sched. 60	Extra Strong	Sched. 80	Sched. 100	Sched. 120	Sched. 140	Sched. 160	Extra Strong
1/2	0.840	674	---	---	0.622	0.622	---	0.564	0.546	---	---	---	0.464	0.252
3/4	1.050	884	---	---	0.824	1.049	---	0.742	0.742	---	---	---	0.612	0.434
1	1.315	1.097	---	---	1.049	1.049	---	0.957	0.957	---	---	---	0.815	0.599
1 1/4	1.660	1.442	---	---	1.380	1.380	---	1.278	1.278	---	---	---	1.160	0.896
1 1/2	1.900	1.682	---	---	1.610	1.610	---	1.500	1.500	---	---	---	1.338	1.100
2	2.375	2.157	---	---	2.067	2.067	---	1.939	1.939	---	---	---	1.687	1.503
2 1/2	2.875	2.635	---	---	2.469	2.469	---	2.323	2.323	---	---	---	2.125	1.771
3	3.500	3.260	---	---	3.068	3.068	---	2.900	2.900	---	---	---	2.624	2.300
3 1/2	4.000	3.760	---	---	3.548	3.548	---	3.364	3.364	---	---	---	---	2.728
4	4.500	4.260	---	---	4.026	4.026	---	3.826	3.826	---	3.624	---	3.438	3.152
5	5.563	5.295	---	---	5.047	5.047	---	4.813	4.813	---	4.563	---	4.313	4.063
6	6.625	6.357	---	---	6.065	6.065	---	5.761	5.761	---	5.501	---	5.187	4.897
8	8.625	8.329	8.125	8.071	7.961	7.981	7.813	7.625	7.625	7.437	7.187	7.001	6.813	6.875
10	10.750	10.420	10.250	10.136	10.020	10.020	9.750	9.750	9.562	9.312	9.062	8.750	8.500	8.750
12	12.750	12.390	12.250	12.090	12.000	11.938	11.625	11.750	11.374	11.062	10.750	10.500	10.126	10.750
14	14.000	13.500	13.376	13.250	13.250	13.124	12.812	13.000	12.500	12.124	11.814	11.500	11.188	---
16	16.000	15.500	15.376	15.250	15.250	15.000	14.688	15.000	14.312	13.938	13.564	13.124	12.812	---
18	18.000	17.500	17.376	17.124	17.250	16.876	16.500	17.000	16.124	15.688	15.250	14.876	14.438	---
20	20.000	19.500	19.250	19.000	19.250	18.812	18.376	19.000	17.938	17.438	17.000	16.500	16.062	---
24	24.000	23.500	23.250	22.876	23.250	22.624	22.062	23.000	21.562	20.938	20.376	19.876	19.312	---
30	30.000	29.376	29.000	28.750	29.250	---	---	29.000	---	---	---	---	---	---
36	36.000	35.376	35.000	34.750	35.250	34.500	---	35.000	---	---	---	---	---	---
42	42.000	---	---	---	41.250	---	---	41.000	---	---	---	---	---	---

NOTES:
1. Always specify bore when ordering.
2. Includes 1/16" raised face in 150lb. and 300 lb. standards. Does not include 1/4" raised face in 400 lb. and heavier standards.
3. Inside pipe diameters are also provided by this table.
4. Other types, sizes and facings on application.
5. Stocked in carbon steel and a variety of other metals and alloys.
6. Light wall diameters are identical to stainless steel Schedule 10S in sizes thru 12", and to Schedule 10 in sizes 14" and larger.

FITTINGS

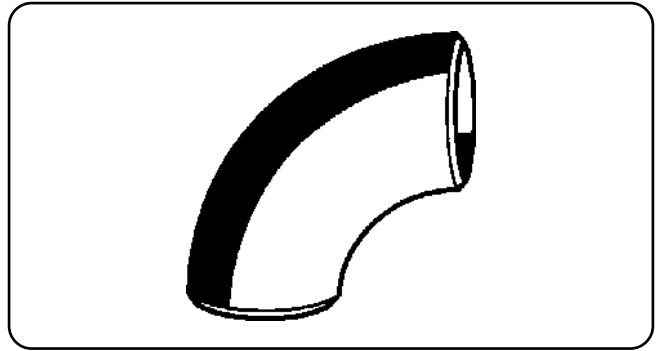
The purpose of a fitting is to change the direction or volume of the flow in piping.

WELDING FITTINGS

These fittings are made from wrought materials and manufactured in both Seamless and Welded Construction.

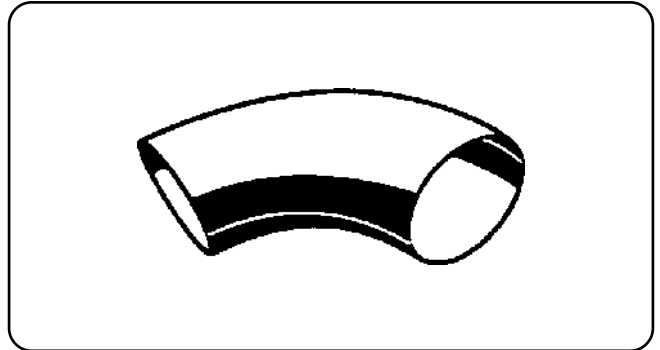
SEAMLESS CONSTRUCTION

The tubing or pipe is heated to a temperature at which the metal is workable and is forced over a mandrel into its final shape. The rough fitting is cooled and machined to apply bevels, then cleaned and marked.



WELDED CONSTRUCTION

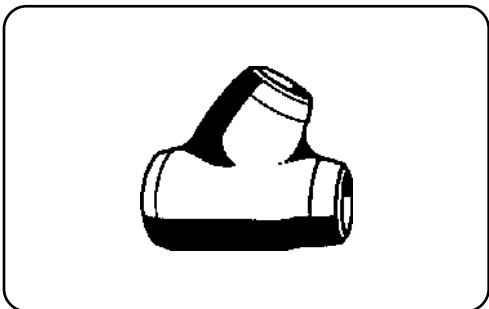
A plate is cut to size and formed in dies. The two sides are welded together. X-Rayed on the weld and then beveled. Fittings can also be manufactured from welded pipe in the same manner as seamless.



WELDED FITTING STANDARDS

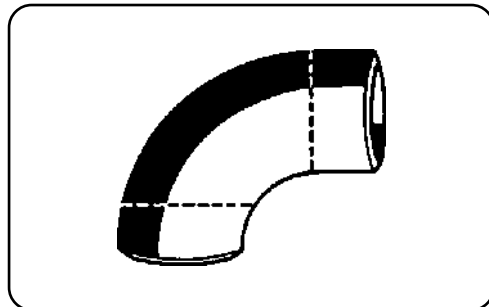
ANSI	B 16.9	Dimensional tolerance through NPS 24
	B 16.25	Butt-welding ends
	B 16.28	Wrought Steel butt weld; short radius elbows and return
MSS-SP-4S		Dimensional tolerances NPS 26 through NPS 48
Wall thickness:		The wall thickness of butt-welding fittings corresponds to the wall thickness of the pipe.

SPECIAL ORDER



HEAVY WALL/SPECIAL END FITTINGS

This fitting is for main steam nuclear power.



LONG TANGENT

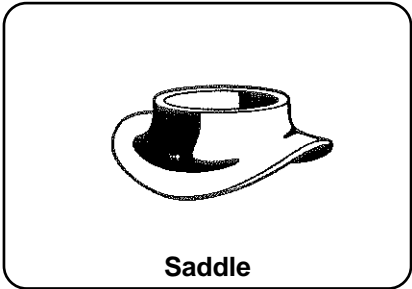
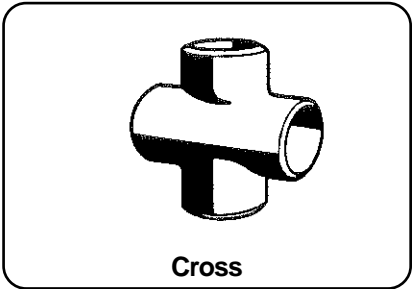
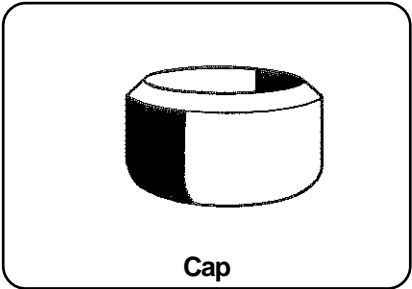
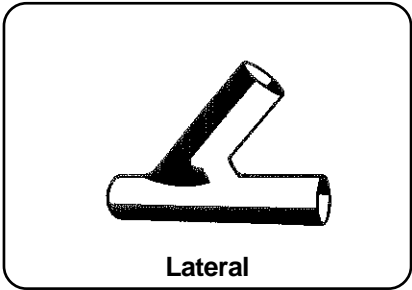
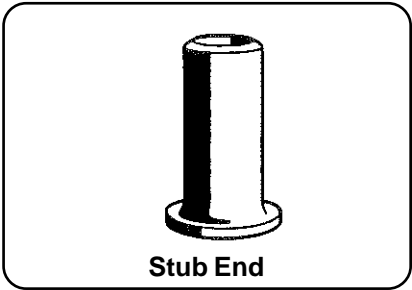
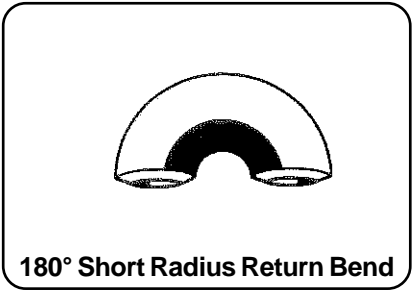
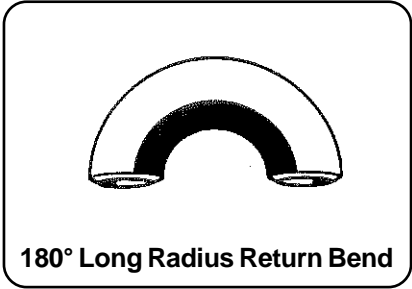
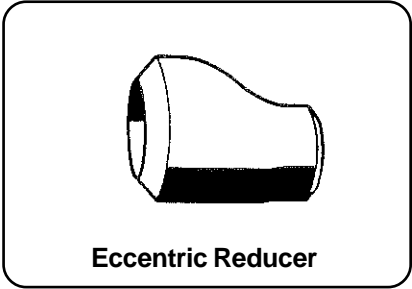
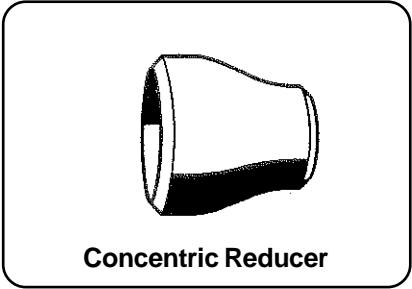
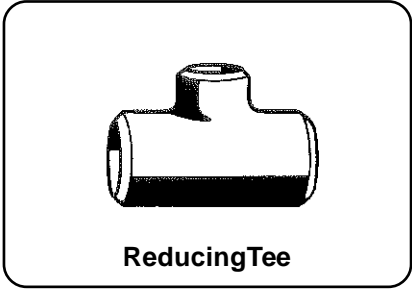
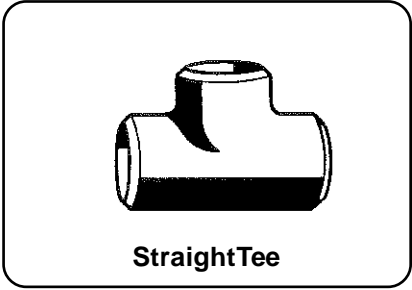
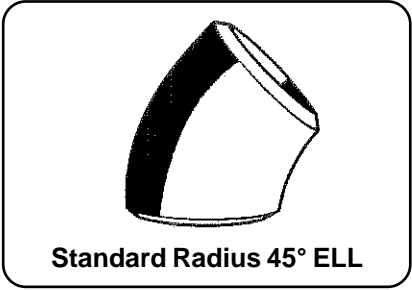
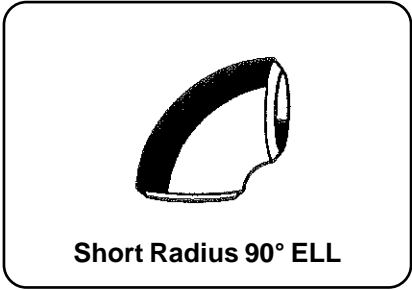
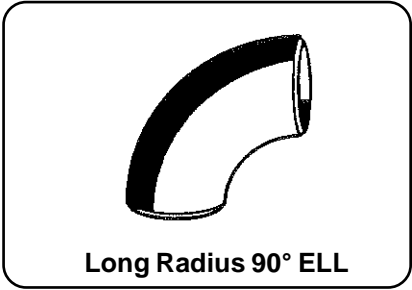
Square cut ends with ends extended beyond normal center to face dimensions.

STANDARD FITTING TYPES

STANDARD BUTT WELD FITTING TYPES

(These fittings are manufactured in both seamless and welded construction)

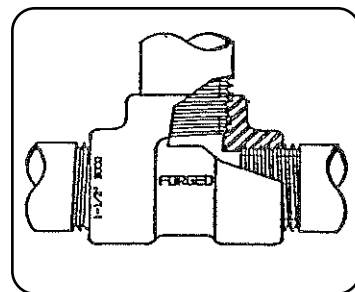
A long radius ELL has a center to face dimension that is 1.5 times the NPS size of the fitting. A short radius ELL is 1.0 times the NPS size! Example: a NPS 6 fitting LR=8", SR =6"



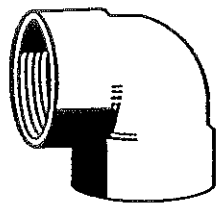
FITTINGS

SCREWED FITTINGS

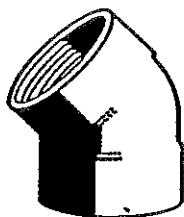
These fittings are made in sizes 1/8" through 4" and in pressure ratings of 150 lb. (1000 lbs. WOG). 2000, 3000 and 6000 lbs. The 150 lb. fitting is made in both cast and forged material. The others are of forged material.



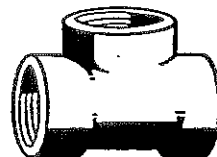
Screwed Fittings Available:



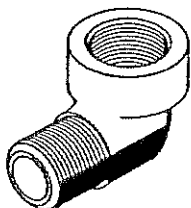
90° ELL



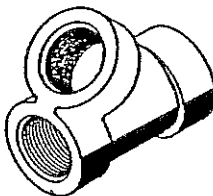
45° ELL



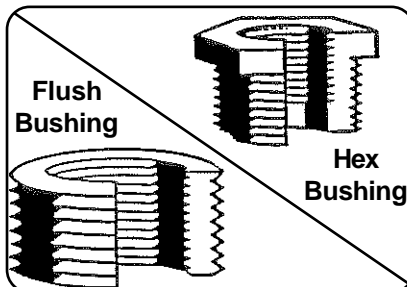
Tee



Street Elbow

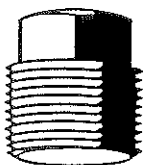


Lateral

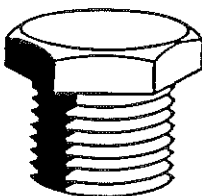


Flush
Bushing

Hex
Bushing



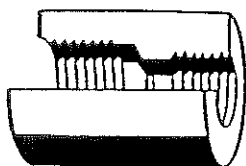
Square Head Plug



Hex Head Plug



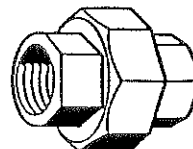
Round Head Plug



Reducing Coupling



Coupling



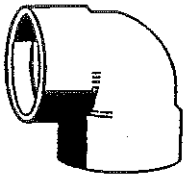
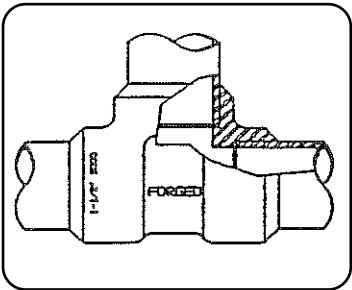
Union

FITTINGS

SOCKET WELD FITTINGS

This fitting design has a socket or recess for the pipe to slip into. A back weld is applied to hold the pipe in the fitting. Socket Weld fittings are formed by either the drop forge or upset forging method. They are forged solid and require complete machining.

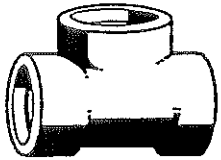
These fittings can be made of carbon, alloy or stainless steel and in nickel alloys in 150, 3000, 6000 and 9000 lb. ratings. The bore or waterway is machined to conform with Schedule 40, 160 and DXH pipe. They are available in the same shapes and sizes as Screwed Fittings including reducing insert bushings. Special bores may be purchased by agreement.



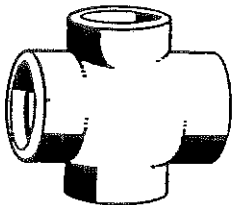
90° Elbow



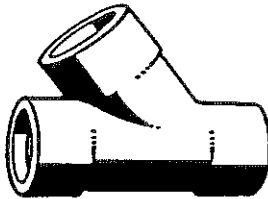
45° Elbow



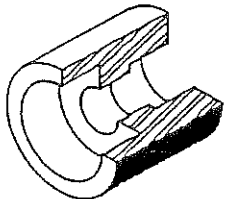
Tee



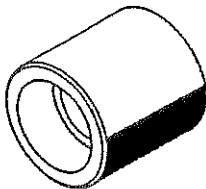
Cross



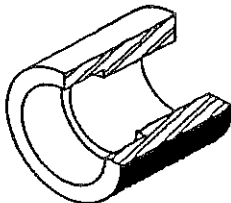
Lateral



Reducer Coupling



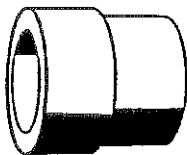
Coupling



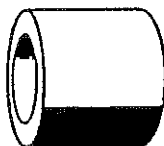
Half Coupling



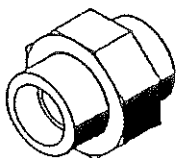
Cap



Type 1 Socket Welding
Reducer Insert



Type 2 Socket Welding
Reducer Insert



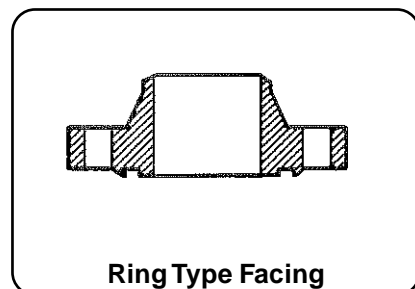
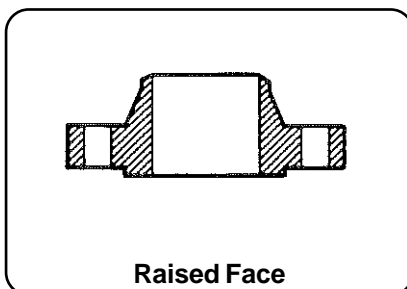
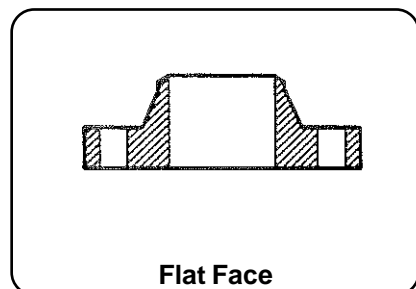
Union

FLANGES

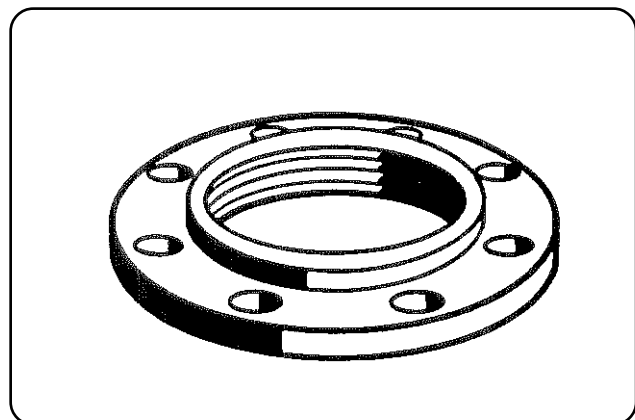
The purpose of a flange is simply to join two pieces of pipe or connect valves or other similar items in a piping system. It may be cast or forged.

FACINGS

One of the most important parts of the flange is the facing. Here are the most commonly used facings:



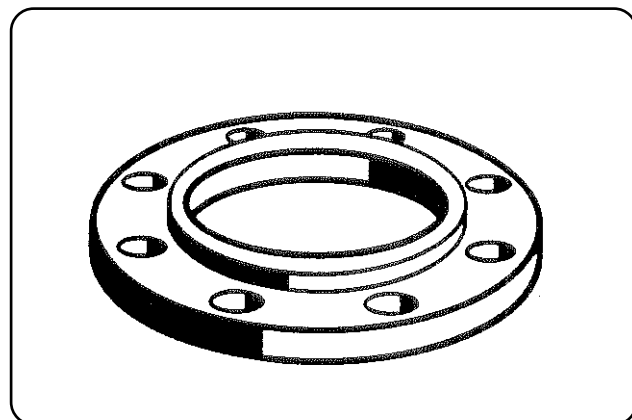
STANDARD FLANGE DESIGNS



THREADED

The bore of this flange is threaded to match the pipe size.

Usage: Low pressure systems and where welding could be hazardous.

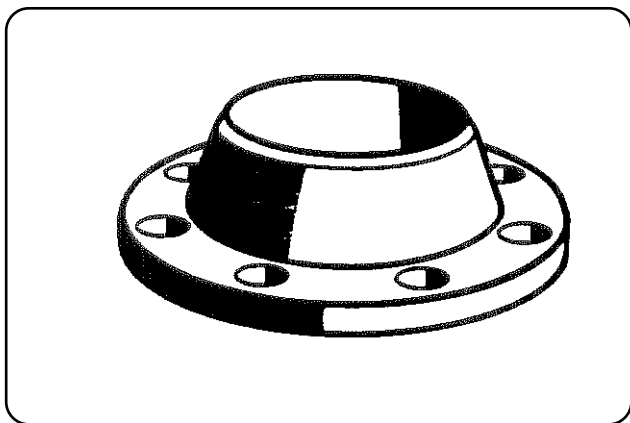


LAP JOINT

Bored slightly larger than the OD of the pipe, the radius on the bottom matches the radius on the stub end. It is slipped over the pipe and a stub end is welded onto the pipe. The flange is then slipped over the stub end and bolted up.

Usage: For systems that need frequent cleaning and/or inspection.

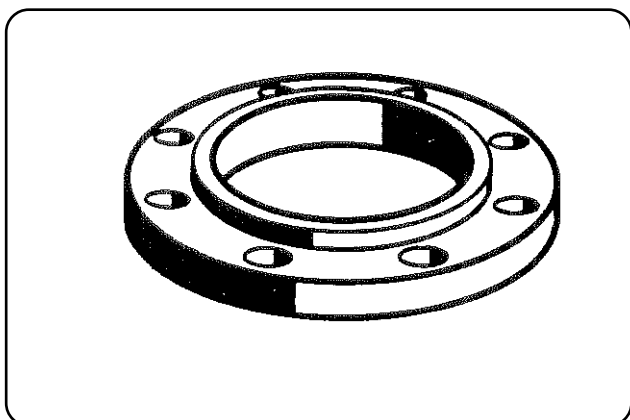
FLANGES



WELDING NECK

Bored to the ID of the pipe and has a high neck to which pipe is welded. Probably the best welding flange available because of its high, heavy neck.

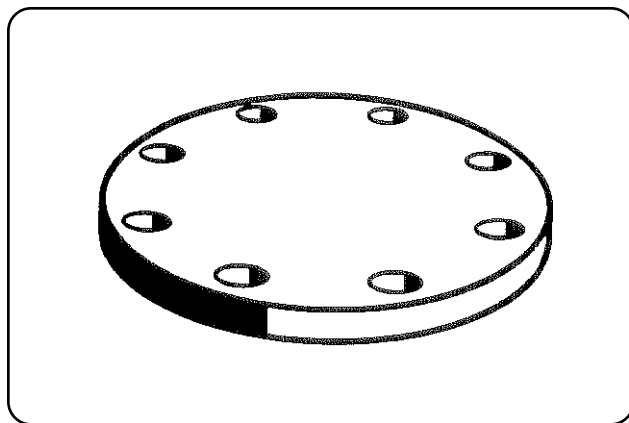
Usage: Wherever a sound welded joint connection is needed.



SLIP-ON

Has a low hub and is bored slightly larger than the OD of the pipe. This flange is welded on both inside and outside of the flange face to prevent leakage.

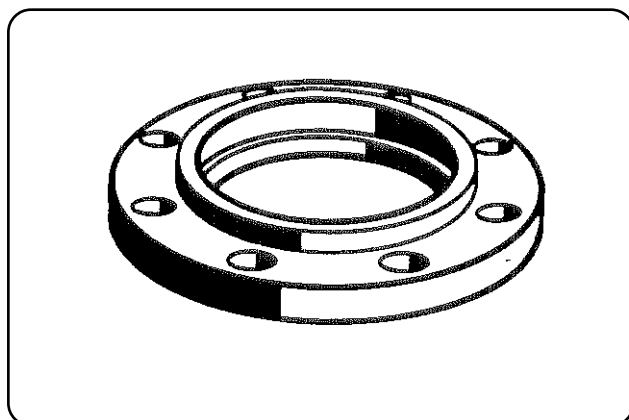
Usage: Used in lieu of welding necks when cost or space is a major consideration.



BLIND FLANGE

As the name indicates this flange is a solid circle drilled to match a companion flange.

Usage: To shut off or blank off piping.



SOCKET WELD

The socket weld flange is bored to the ID of the pipe and counter bored slightly larger than the OD of the pipe to allow the pipe to be inserted and welded in place.

Usage: Usually NPS 4 - 300# & 600 + 150' up to NPS 24.

PRESSURE CLASSES

Generally flanges are manufactured in pressure classes of 150, 300, 400, 600, 900, 1500 and 2500 lbs.