

परफेक्ट



PERFECTT SERVICES (MADRAS)

An ISO 9001 : 2000 Certified Company

FLANGES ❖ PIPE FITTINGS ❖ STRAINERS

Quality Control

All our pipe fittings are manufactured under complete quality check guided by the codes & as directed by the customers. Each of our product is checked right from the raw material stage upto final products as per quality manual & quality assurance plan approved by the clients. We have our equipments & measuring instruments duly calibrated by approved agency's.

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Quality Policy

"Perfectt is committed to the highest products and process quality, as well as sustained cost effectiveness are attained by continuous improvements at all levels and in all areas. At the same time we focus on optimal work safety and appropriate environmental protection".



Dear Sir,

We take pleasure to introduce ourselves as manufacturers of **Flanges, Fittings and Strainers**.

We are an **ISO 9001 : 2000** Certified Company have been in existence from 1992, manufacturing **Strainers, Flanges & Pipe Fittings** only. We have factories one at Kolkata and one more at Vishakapatnam. Our Kolkata Plant manufactures Strainers while Vishak Plant manufactures Flanges & Fittings.

We would like to emphasize more on our activities as follows.

A Brief note on our Strainers.

The production and computer aided in house design facility for our Strainers is being headed by our company President Dr. Pulak De an eminent engineer from I.I.T. Khargpur.

An efficient Strainer can and will reduce total system loss and save power to pay back for itself. This efficiency is demonstrable in model tests in R&D facilities at our works.

Quality Control covers all aspects from Raw Material to sub-assembly to testing of Final Assembly before dispatch.

Our testing facilities include Hydro Testing, Flow Testing, Vacuum Testing, Pneumatic Testing on Assembled Strainers in addition to Non-destructive tests on Fabricated sub-assemblies. These test facilities provide to basis of Quality Assurance.

One such application that have won laurels to display is for Nuclear Power Corporation. Special Helium leak testing facility has been developed for this application.

Here our Engineers are continuously studying the characteristics of Strainer operation and trying to improve upon them. Strainers have been tested and inspected by consultants **UL, TATA Projects, Germanischer Lloyds, BVIS, SGS, PDIL** and others.

Additionally Instrumentation is also available for measuring parameters like Temperature, Sound and vibration. In house Calibration facility like Dead Weight Tester is available for Pressure Gauge Calibration.

Range of Strainers being made cover Simplex and Duplex Basket Strainers, Y-Strainers and Tee Strainers, from sizes of 40 mm NB to 1000 mm NB. Materials of construction range from Mild Steel, Carbon Steel, and Cast Iron to Bronzes and Special Grades of Stainless Steel for Special application.

Our Vishakapatnam plant manufactures Fittings & Flanges. These products are available with the materials grade of MS, CS, SS, & AS.

Our range of Flanges are starting from ½" to 24" & apart from the existing range we do customize as per your requirement. We have done so far upto 64" is for your information please.

In addition, we would be in a position to issue **IBR certification** for Flanges, Fittings and we have its ready stock up to 24".

We have Clients Based in Petroleum, Oil, Power, Chemicals, Refineries, Fertilizers, Paper Cement, Sugar, Pharma, in Private Sector as well as Public Sector. We are also approved by many consultants.

Our strength is we not only manufacture quality products but also we maintain a huge stock of raw materials & finished products in our warehouse & in our workshops to cater to prompt delivery to our esteemed customers & give them complete satisfaction.

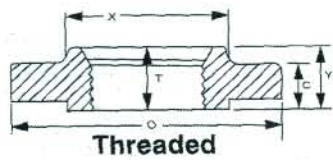
With kind regards,

Yours Sincerely,

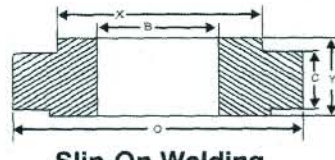
For **PERFECTT SERVICES (MADRAS)**

Manoj Kumar Chaudhury

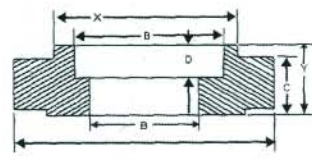
CEO



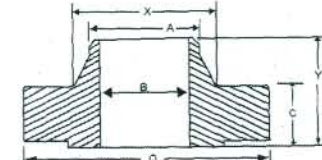
Threaded



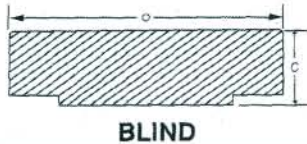
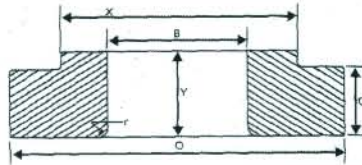
Slip-On Welding



SOCKET WELD (1/2 to 3 Only)



WELDING NECK

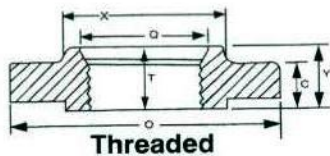


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**DIMENSIONS OF CLASS 150 FLANGES
 AS PER B 16.5**

Nominal Pipe Size (NPS)	Outside Dia Of Flange 'O'	Thickness Of Flange 'C'	Dia Of Hub 'X'	Length Through Hub 'Y'			Thread length T	Bore 'B'			
				Threaded Slip on Socket Welding	Lapped	Weld Neck		Slip On Socket Welding	Lapped	Weld Neck Socket Welding	Depth Of Socket
1/2"	88.9	11.2	30.226	15.748	15.748	47.752	15.748	22.352	22.86	15.748	9.652
3/4"	98.6	12.7	38.1	15.748	15.748	52.324	15.748	27.686	28.194	20.828	11.176
1"	108.0	14.2	49.276	17.526	17.526	55.626	17.526	34.544	35.052	26.67	12.7
1 1/4"	117.3	15.7	58.674	20.574	20.574	57.15	20.574	43.18	43.688	35.052	14.224
1 1/2"	127.0	17.5	65.024	22.352	22.352	61.976	22.352	49.53	50.038	40.894	15.748
2"	152.4	19.1	77.724	25.4	25.4	63.5	25.4	61.976	62.484	52.578	17.526
2 1/2"	177.8	22.4	90.424	28.448	28.448	69.85	28.448	74.676	75.438	62.738	19.05
3"	190.5	23.9	107.95	30.226	30.226	69.85	30.226	90.678	91.44	77.978	20.574
3 1/2"	215.9	23.9	122.174	31.75	31.75	71.374	31.75	103.378	104.14	90.17	....
4"	228.6	23.9	134.874	33.274	33.274	76.2	33.724	116.84	116.84	102.362	....
5"	254.0	23.9	163.576	36.576	36.576	88.9	36.576	143.764	144.526	128.27	....
6"	279.4	25.4	192.24	39.624	39.624	88.9	39.624	170.688	171.45	154.178	....
8"	342.9	28.4	246.126	44.45	44.45	101.6	44.45	221.488	222.25	202.692	....
10"	406.4	30.2	304.8	49.276	49.276	101.6	49.276	276.352	277.368	254.508	....
12"	482.6	31.8	365.252	55.626	55.626	114.3	55.626	327.152	328.168	304.8	....
14"	533.4	35.1	400.05	57.15	79.248	127	57.15	359.156	360.172		....
16"	596.9	36.6	457.2	63.5	87.376	127	63.5	410.464	411.226		....
18"	635.0	40.1	504.952	68.326	96.774	139.7	68.326	461.772	462.28		....
20"	698.5	42.9	558.8	73.152	103.124	144.526	73.152	513.08	514.35		....
24"	812.8	47.8	663.448	82.55	111.252	152.4	82.55	615.95	615.95	

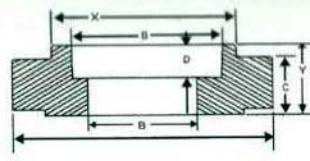
To be specified by purchaser



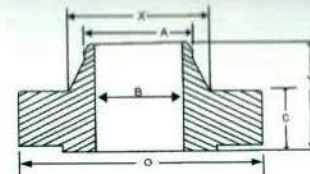
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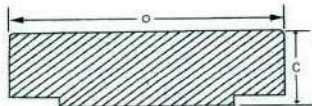
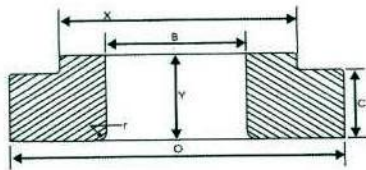
Slip-On Welding



SOCKET WELD (1/2 to 3 Only)



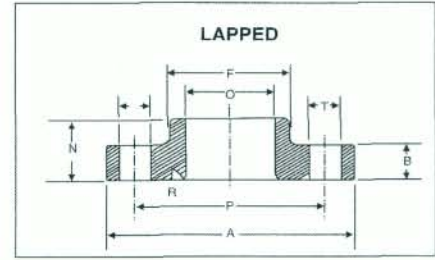
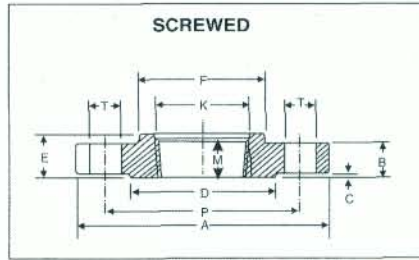
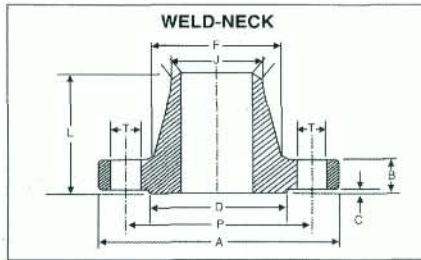
WELDING NECK



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DIMENSIONS OF CLASS 300 FLANGES

Nominal Pipe Size (NPS)	Outside Dia Of Flange 'O'	Thickness Of Flange 'C'	Dia Of Hub 'X'	Length Through Hub 'Y'			Thread length 'T'	Bore 'B'			Counter bore Threaded Flange 'C'	Depth Of Socket
				Threaded Slip on Socket Welding	Lapped	Weld Neck		Slip On Socket Welding	Lapped	Weld Neck Socket Welding		
1/2"	95.3	14.2	38.1	22.352	22.352	52.324	15.748	22.352	22.86	15.748	23.622	9.652
3/4"	117.3	15.7	47.752	25.4	25.4	57.15	15.748	27.686	28.194	20.828	28.956	11.176
1"	124.0	17.5	53.848	26.924	26.924	61.976	17.526	34.544	35.052	26.67	35.814	12.7
1 1/4"	133.4	19.1	63.5	26.924	26.924	65.024	20.574	43.18	43.688	35.052	44.45	14.224
1 1/2"	155.4	20.6	69.85	30.226	30.226	68.326	22.352	49.53	50.038	40.894	50.292	15.748
2"	165.1	22.4	84.074	33.274	33.274	69.85	28.448	61.976	62.484	52.578	63.5	17.526
2 1/2"	190.5	25.4	100.076	38.1	38.1	76.2	31.75	74.676	75.438	62.738	76.2	19.05
3"	209.6	28.4	117.348	42.926	42.926	79.248	31.75	90.678	91.44	77.978	92.202	20.574
3 1/2"	228.6	30.2	133.35	44.45	44.45	81.026	36.576	103.378	104.14	90.17	104.902	.....
4"	254.0	31.8	146.05	47.752	47.752	85.852	36.576	116.078	116.84	102.362	117.602	.....
5"	279.4	35.1	177.8	50.8	50.8	98.552	42.926	143.764	144.526	128.27	144.526	.....
6"	317.5	36.6	206.248	52.324	52.324	98.552	45.974	170.688	171.45	154.178	171.45	.....
8"	381.0	41.1	260.35	61.976	61.976	111.252	50.8	221.488	222.25	202.692	222.25	.....
10"	444.5	47.8	320.548	66.548	95.25	117.348	55.626	276.352	277.368	254.508	276.352	....
12"	520.7	50.8	374.65	73.152	101.6	130.048	60.452	327.152	328.168	304.8	328.676	.....
14"	584.2	53.8	425.45	76.2	111.252	142.748	63.5	359.156	360.172	To be specified by purchaser	360.426	.....
16"	647.7	57.2	482.6	82.55	120.65	146.05	68.326	410.464	411.226		411.226	.....
18"	711.2	60.5	533.4	88.9	130.048	158.75	69.85	461.772	462.28		462.026	.....
20"	774.7	63.5	587.248	95.25	139.7	162.052	73.152	513.08	514.35		512.826	.....
24"	914.4	69.9	701.548	106.426	152.4	168.148	82.55	615.95	615.95		614.426	.....



DIMENSIONS OF CLASS 600 FLANGES AS PER ANSI B 16.5

N.B.	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	T	No.of Holes
15	95	14.3	6.4	35	22	38	22.4	9.5	21.3	23.5	52	16	22	23.0	66.7	3.0	15.9	4
20	117	15.9	6.4	43	25	48	27.7	11.0	26.7	29.0	57	16	25	28.0	82.6	3.0	19.0	4
25	124	17.5	6.4	51	27	54	34.5	12.5	33.4	36.0	62	17	27	35.0	88.9	3.0	19.0	4
32	133	20.6	6.4	64	29	64	43.2	14.5	42.2	44.5	67	21	29	43.5	98.4	5.0	19.0	4
40	156	22.2	6.4	73	32	70	49.5	16.0	48.3	50.5	70	22	32	50.0	114.3	6.5	22.2	4
50	165	25.4	6.4	92	37	84	62.0	17.5	60.3	63.5	73	29	37	62.5	127.0	8.0	19.0	8
65	190	28.6	6.4	105	41	100	74.7	19.0	73.0	76.0	79	32	41	75.5	149.2	8.0	22.2	8
80	210	31.8	6.4	127	46	117	90.7	20.5	88.9	92.0	83	35	46	91.5	168.3	9.5	22.2	8
90	229	34.9	6.4	140	49	133	103.4	-	101.6	105.0	86	40	49	104.0	184.2	9.5	25.4	8
100	273	38.1	6.4	157	54	152	116.1	-	114.3	118.0	102	41	54	117.0	215.9	11.0	25.4	8
125	330	44.4	6.4	186	60	189	143.8	-	141.3	145.0	114	48	60	145.0	266.7	11.0	28.6	8
150	356	47.6	6.4	216	67	222	170.7	-	168.3	171.0	117	51	67	171.0	292.1	12.5	28.6	12
200	419	55.6	6.4	270	76	273	221.5	-	219.1	222.0	133	57	76	222.0	349.2	12.5	31.8	12
250	508	63.5	6.4	324	86	343	276.4	-	273.0	276.0	152	65	111	277.0	431.8	12.5	34.9	16
300	559	66.7	6.4	381	92	400	327.2	-	323.9	329.0	156	70	117	328.0	489.0	12.5	34.9	20
350	603	69.8	6.4	413	94	432	359.2	-	355.6	360.0	165	73	127	360.0	527.0	12.5	38.1	20
400	686	76.2	6.4	470	106	495	410.5	-	406.4	411.0	178	78	140	411.0	603.2	12.5	41.3	20
450	743	82.6	6.4	533	117	546	461.8	-	457.2	462.0	184	79	152	462.0	654.0	12.5	44.4	20
500	813	88.9	6.4	584	122	610	513.1	-	508.0	513.0	190	83	165	514.0	723.9	12.5	44.4	24
600	940	101.6	6.4	692	140	718	616.0	-	609.6	614.0	203	92	184	616.0	838.2	12.5	50.8	24

DIMENSIONS OF CLASS 1500 FLANGES AS PER ANSI B 16.5

N.B.	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	T	No.of Holes
15	121	22.2	6.4	35	32	38	22.4	9.5	21.3	23.5	60	22	32	23.0	82.6	3.0	22.2	4
20	130	25.4	6.4	43	35	44	27.7	11.0	26.7	29.0	70	25	35	28.0	88.9	3.0	22.2	4
25	149	28.6	6.4	51	41	52	34.5	12.5	33.4	36.0	73	29	41	35.0	101.6	3.0	25.4	4
32	159	28.6	6.4	64	41	64	43.2	14.5	42.2	44.5	73	30	41	43.5	111.1	5.0	25.4	4
40	178	31.8	6.4	73	44	70	49.5	16.0	48.3	50.5	83	32	44	50.0	123.8	6.5	28.6	4
50	216	38.1	6.4	92	57	105	62.0	17.5	60.3	63.5	102	38	57	62.5	165.1	8.0	25.4	8
65	244	41.3	6.4	105	64	124	74.7	19.0	73.0	76.0	105	48	64	75.5	190.5	8.0	28.6	8
80	267	47.6	6.4	127	73	133	-	-	88.9	92.0	117	51	73	91.5	203.2	9.5	31.8	8
100	311	54.0	6.4	157	91	162	-	-	114.3	118.0	124	57	91	117.0	241.3	11.0	34.9	8
125	325	73.0	6.4	186	105	197	-	-	141.3	145.0	156	64	105	145.0	292.1	11.0	41.3	8
150	394	82.6	6.4	216	119	229	-	-	168.3	171.0	171	70	119	171.0	317.5	12.5	38.1	12
200	483	92.1	6.4	270	143	292	-	-	219.1	222.0	213	75	143	222.0	393.7	12.5	44.4	12
250	584	108.0	6.4	324	159	368	-	-	273.0	276.0	254	84	178	277.0	482.6	12.5	50.8	12
300	673	123.8	6.4	381	181	451	-	-	323.9	329.0	283	92	219	328.0	571.5	12.5	54.0	16
350	749	133.4	6.4	413	495	-	-	-	356.6	-	298	-	241	360.0	635.0	12.5	60.3	16
400	826	146.1	6.4	470	-	552	-	-	406.4	-	311	-	260	411.0	704.8	12.5	66.7	16
450	914	161.9	6.4	533	-	597	-	-	457.2	-	327	-	276	462.0	774.7	12.5	73.0	16
500	984	178.0	6.4	584	-	641	-	-	508.0	-	356	-	292	514.0	831.8	12.5	79.4	16
600	1168	203.0	6.4	692	-	762	-	-	609.6	-	406	-	330	616.0	990.6	12.5	92.0	16

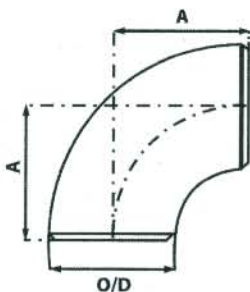
1) All dimensions are in Millimeters

2) Flanges except Lap Joint will be furnished with (1.6) Raised Face, which is included in "Thickness(C)" and "Length through Hub(Y)".

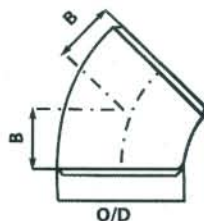
DIMENSIONAL TOLERANCES

Threaded, Socket-Welding, Slip-on, Lap Joint and Blind			Welding Neck		
Outside Diameter	When O.D. is 24" or less	± 1/16" (16mm)	Outside Diameter	When O.D. is 24" or less	± 1/16" (16mm)
	When O.D. is Over 24"	+ 1/8" (3.2mm)		When O.D. is Over 24"	± 1/8" (3.2mm)
Inside Diameter	Threaded	Within limits on boring guage	Inside Diameter	10" and Smaller	+ 1/32" (0.8mm)
	Socket-Welding, Slip-on and Lap joint	10" & Smaller + 1/32" (0.8mm) - 0"		12" thru 18"	+ 1/16" (1.6mm)
12" & Larger + 1/16" (1.6mm) - 0"		20" and Larger			+ 1/8" (3.2mm) - 1/16" (1.6mm)
Outside Diameter of Hub	12" and Smaller	+ 1/32" (0.8mm) - 1/16" (1.6mm)	Diameter of Contact Face	1/16" Raised Face	+ 1/32" (0.8mm)
	14" and Larger	± 1/8" (3.2mm)		1/4" Raised Face Tongue & Groove Male, Female	+ 1/64" (0.4mm) ±
Diameter of Contact Face	1/16" Raised Face	± 1/32" (0.8mm)	Diameter of Hub at Base	When Hub Base is 24" or Smaller	= 1/16" (1.6mm)
	1/4" Raised Face Tongue & Groove Male, Female	1/64" (0.4mm)		When Hub Base is Over 24"	- 1/8" (3.2mm)
Diameter of Counterbore	Same as for Inside Diameter		Diameter of Hub at Point of Welding	5" and Smaller	+ 3/32" (2.4mm) - 1/32" (0.8mm)
				6" and Larger	+ 5/32" (4.0mm) - 1/32" (0.8mm)
				Bolt Circle	+1/16" (1.6mm)
Drilling	Bolt Circle	± 1/16" (1.6mm)	Drilling	Bolt hole spacing	+ 1/32" (0.8mm)
	Bolt hole Spacing	± 1/32" (0.8mm)		Eccentricity of Both Circle with Respect to Facing	2 1/2" & Smaller 1/32" (0.8mm) max
	Eccentricity of Both Circle with Respect to Facing	2 1/2" & Smaller 1/32" (0.8mm) max 3" & Larger 1/16" (1.6mm) max			3" & Larger 1/16" (1.6mm) max
				Eccentricity of Both Circle with Respect to Bore	1/32" (0.8mm) max
	Eccentricity of Facing with Respect to Bore	1/32" (0.8mm) max			
Thickness	18" and Smaller	+ 1/8" (3.2mm) - 0"	Thickness	18" and Smaller	+ 1/8" (3.2mm) - 0"
	20" and Larger	+ 3/16" (4.8mm) - 0"		20" and Larger	+ 3/16" (4.8mm) - 0"
Length	10" and Smaller	± 1/16" (1.6mm)	Length	10" and Smaller	+1/16" (1.6mm)
Thru Hub	12" and Larger	± 1/8" (3.2mm)	Thru Hub	12" and Larger	+1/8" (3.2mm)

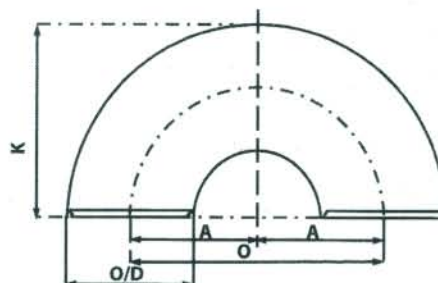
BUTT WELD PIPE FITTINGS



90 Deg. LR ELBOW



45 Deg. LR ELBOW



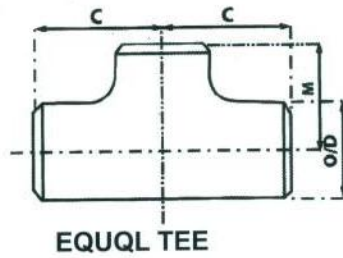
180 Deg. LR RETURN BEND

AS PER B 16.9

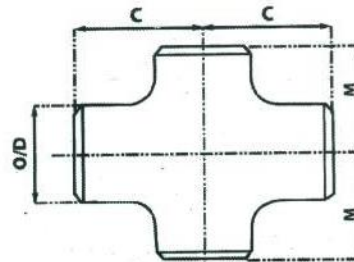
Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)	Dimension A	Dimension B	Center to Center O	Back to Face K
1/2"	21.3	38.0	16	76	48
3/4"	26.7	38.0	19	76	51
1"	33.4	38.4	22	76	56
1 1/4"	42.2	48.0	25	95	70
1 1/2"	48.3	57.0	29	114	83
2"	60.3	76.0	35	152	106
2 1/2"	73.0	95.0	44	190	132
3"	88.9	114.0	51	229	159
3 1/2"	101.6	133.0	57	267	184
4"	114.3	152.0	64	305	210
5"	141.3	190.0	79	381	262
6"	168.3	229.0	95	457	313
8"	219.1	305.0	127	610	414
10"	273.0	381.0	159	762	518
12"	323.8	457.0	190	914	619
14"	355.6	533.0	222	1067	711
16"	406.4	610.0	254	1219	813
18"	457.0	686.0	286	1372	914
20"	508.0	762.0	318	1524	1016
22"	559.0	838.0	343	1676	1118
24"	610.0	914.0	381	1829	1219
26"	660.0	991.0	406	.....	.....
28"	711.0	1067.0	438	.....	.....
30"	762.0	1143.0	470	.....	.....
32"	813.0	1219.0	502	.....	.....
34"	864.0	1295.0	533	.....	.....
36"	914.0	1372.0	565	.....	.....

NOTE : ALL DIMENSIONS ARE IN MM.

BUTT WELD PIPE FITTINGS



EQUQL TEE



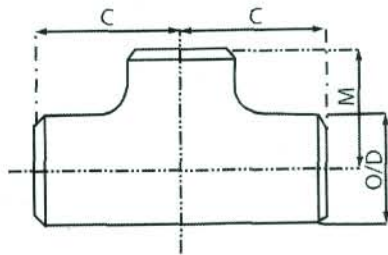
CROSS

AS PER B 16.9

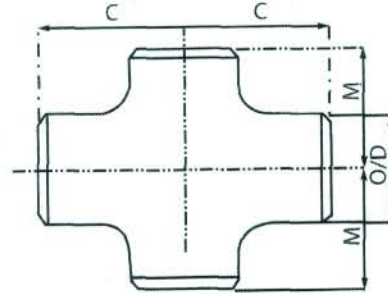
Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)	Run 'C'	Outlet 'M'
1/2"	21.3	25	25
3/4"	26.7	29	29
1"	33.4	38	38
1.1/4"	42.2	48	48
1.1/2"	48.3	57	57
2"	60.3	64	64
2.1/2"	73.0	76	76
3"	88.9	86	86
3.1/2"	101.6	95	95
4"	114.3	105	105
5"	141.3	124	124
6"	168.3	143	143
8"	219.1	178	178
10"	273.0	216	216
12"	323.8	254	254
14"	355.6	279	279
16"	406.4	305	305
18"	457.0	343	343
20"	508.0	381	381
22"	559.0	419	419
24"	610.0	432	432
26"	660.0	495	495
28"	711.0	521	521
30"	762.0	559	559
32"	813.0	597	597
34"	864.0	635	635
36"	914.0	673	673

NOTE : ALL DIMENSIONS ARE IN MM.

BUTT WELD PIPE FITTINGS



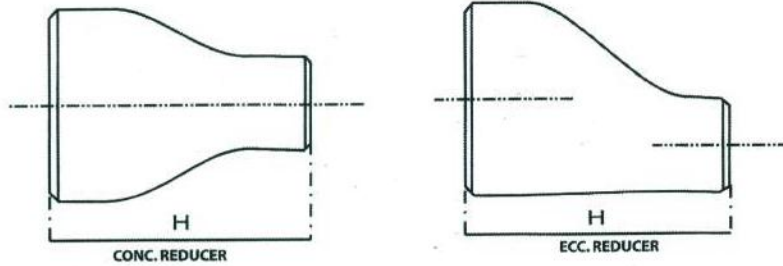
UNEQUAL TEE.



CROSS UNEQUAL

Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)		Center - to - Center		Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)		Center - to - Center	
	Run	Outlet	Run 'C'	Outlet 'M'		Run	Outlet	Run 'C'	Outlet 'M'
1/2" x 3/8"	21.3	17.3	25	25	10" x 8"	273.0	219.1	216	203
1/2" x 1/4"	21.3	13.7	25	25	10" x 6"	273.0	168.3	216	194
					10" x 5"	273.0	141.3	216	191
3/4" x 1/2"	26.7	21.3	29	29	10" x 4"	273.0	114.3	216	184
3/4" x 3/8"	26.7	17.3	29	29					
1" x 3/4"	33.4	26.7	38	38	12" x 10"	323.8	273.0	254	241
1" x 1/2"	33.4	21.3	38	38	12" x 8"	323.8	219.1	254	229
					12" x 6"	323.8	168.3	254	219
					12" x 5"	323.8	141.3	254	216
1.1/4" x 1"	42.2	33.4	48	48					
1.1/4" x 3/4"	42.2	26.7	48	48	14" x 12"	355.6	323.8	279	270
1.1/4" x 1/2"	42.2	21.3	48	48	14" x 10"	355.6	273.0	279	257
					14" x 8"	355.6	219.1	279	248
1.1/2" x 1.1/4"	48.3	42.2	57	57	14" x 6"	355.6	168.3	279	238
1.1/2" x 1"	48.3	33.4	57	57					
1.1/2" x 3/4"	48.3	26.7	57	57	16" x 14"	406.4	355.6	305	305
1.1/2" x 1/2"	48.3	21.3	57	57	16" x 12"	406.4	323.8	305	295
					16" x 10"	406.4	273.0	305	283
2" x 1.1/2"	60.3	48.3	64	60	16" x 8"	406.4	219.1	305	273
2" x 1.1/4"	60.3	42.2	64	57	16" x 6"	406.4	168.3	305	264
2" x 1"	60.3	33.4	64	51					
2" x 3/4"	60.3	26.7	64	44	18" x 16"	457.0	406.4	343	330
					18" x 14"	457.0	355.6	343	330
2.1/2" x 2"	73.0	60.3	76	70	18" x 12"	457.0	323.8	343	321
2.1/2" x 1.1/2"	73.0	48.3	76	67	18" x 10"	457.0	273.0	343	308
2.1/2" x 1.1/4"	73.0	42.2	76	64	18" x 8"	457.0	219.1	343	298
2.1/2" x 1"	73.0	33.4	76	57					
3" x 2.1/2"	88.9	73.0	86	83	20" x 18"	508.0	457.0	381	368
3" x 2"	88.9	60.3	86	76	20" x 16"	508.0	406.4	381	356
3" x 1.1/2"	88.9	48.3	86	73	20" x 14"	508.0	355.6	381	356
3" x 1.1/4"	88.9	42.2	86	70	20" x 12"	508.0	323.8	381	346
					20" x 10"	508.0	273.0	381	333
					20" x 8"	508.0	219.1	381	324
3.1/2" x 3"	101.6	88.9	95	92					
3.1/2" x 2.1/2"	101.6	73.0	95	89	22" x 20"	559.0	508.0	419	406
3.1/2" x 2"	101.6	60.3	95	83	22" x 18"	559.0	457.0	419	394
3.1/2" x 1.1/2"	101.6	48.3	95	79	22" x 16"	559.0	406.4	419	381
					22" x 14"	559.0	355.6	419	381
4" x 3.1/2"	114.3	101.6	105	102	22" x 12"	559.0	323.8	419	371
4" x 3"	114.3	88.9	105	98	22" x 10"	559.0	273.0	419	359
4" x 2.1/2"	114.3	73.0	105	95					
4" x 2"	114.3	60.3	105	89	24" x 22"	610.0	559.0	432	432
4" x 1.1/2"	114.3	48.3	105	86	24" x 20"	610.0	508.0	432	432
					24" x 18"	610.0	457.0	432	419
					24" x 16"	610.0	406.4	432	406
5" x 4"	141.3	114.3	124	117	24" x 14"	610.0	355.6	432	406
5" x 3.1/2"	141.3	101.6	124	114	24" x 12"	610.0	323.8	432	397
5" x 3"	141.3	88.9	124	111	24" x 10"	610.0	273.0	432	384
5" x 2.1/2"	141.3	73.0	124	108					
5" x 2"	141.3	60.3	124	105	26" x 24"	660.0	610.0	495	483
					26" x 22"	660.0	559.0	495	470
6" x 5"	168.3	141.3	143	137	26" x 20"	660.0	508.0	495	457
6" x 4"	168.3	114.3	143	130	26" x 18"	660.0	457.0	495	444
6" x 3.1/2"	168.3	101.6	143	127	26" x 16"	660.0	406.4	495	432
6" x 3"	168.3	88.9	143	124	26" x 14"	660.0	355.6	495	432
6" x 2.1/2"	168.3	73.0	143	121	26" x 12"	660.0	323.8	495	422
8" x 6"	219.1	168.3	178	168	28" x 26"	711.0	660.0	521	521
8" x 5"	219.1	141.3	178	162	28" x 24"	711.0	610.0	521	508
8" x 4"	219.1	114.3	178	156	28" x 22"	711.0	559.0	521	495
8" x 3.1/2"	219.1	101.6	178	152	28" x 20"	711.0	508.0	521	483

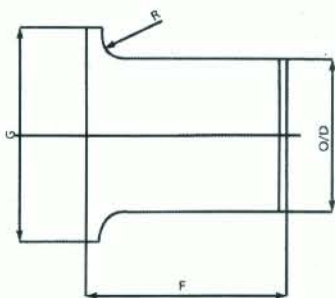
BUTT WELD PIPE FITTINGS



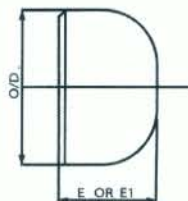
AS PER B 16.9

Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)		End-to-End H	Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)		End-to-End H
	Run	Outlet			Run	Outlet	
3/4" x 1/2"	26.7	21.3	38	12" x 10"	323.8	273.0	203
3/4" x 3/8"	26.7	17.3	38	12" x 8"	323.8	219.1	203
1" x 3/4"	33.4	26.7	51	12" x 6"	323.8	168.3	203
1" x 1/2"	33.4	21.3	51	12" x 5"	323.8	141.3	203
1.1/4" x 1"	42.2	33.4	51	14" x 12"	355.6	323.8	330
1.1/4" x 3/4"	42.2	26.7	51	14" x 10"	355.6	273.0	330
1.1/4" x 1/2"	42.2	21.3	51	14" x 8"	355.6	219.1	330
1.1/2" x 1.1/4"	48.3	42.2	64	14" x 6"	355.6	168.3	330
1.1/2" x 1"	48.3	33.4	64	16" x 14"	406.4	355.6	356
1.1/2" x 3/4"	48.3	26.7	64	16" x 12"	406.4	323.8	356
1.1/2" x 1/2"	46.3	21.3	64	16" x 10"	406.4	273.0	356
2" x 1.1/2"	60.3	48.3	76	16" x 8"	406.4	219.1	356
2" x 1.1/4"	60.3	42.2	76	18" x 16"	457.0	406.4	381
2" x 1"	60.3	33.4	76	18" x 14"	457.0	356.6	381
2" x 3/4"	60.3	26.7	76	18" x 12"	457.0	323.8	381
2.1/2" x 2"	73.0	60.3	89	18" x 10"	457.0	273.0	381
2.1/2" x 1.1/2"	73.0	48.3	89	20" x 18"	508.0	457.0	508
2.1/2" x 1.1/4"	73.0	42.2	89	20" x 16"	508.0	406.4	508
2.1/2" x 1"	73.0	33.4	89	20" x 14"	508.0	355.6	508
3" x 2.1/2"	88.9	73.0	89	20" x 12"	508.0	323.8	508
3" x 2"	88.9	60.3	89	22" x 20"	559.0	508.0	508
3" x 1.1/2"	88.9	48.3	89	22" x 18"	559.0	457.0	508
3" x 1.1/4"	88.9	42.2	89	22" x 16"	559.0	406.4	508
3.1/2" x 3"	101.6	88.9	102	22" x 14"	559.0	355.6	508
3.1/2" x 2.1/2"	101.6	73.0	102	24" x 22"	610.0	559.0	508
3.1/2" x 2"	101.6	60.3	102	24" x 20"	610.0	508.0	508
3.1/2" x 1.1/2"	101.6	48.3	102	24" x 18"	610.0	457.0	508
4" x 3.1/2"	114.3	101.6	102	24" x 16"	610.0	406.4	508
4" x 3"	114.3	88.9	102	26" x 24"	660.0	610.0	610
4" x 2.1/2"	114.3	73.0	102	26" x 22"	660.0	559.0	610
4" x 2"	114.3	60.3	102	26" x 20"	660.0	508.0	610
4" x 1.1/2"	114.3	48.3	102	26" x 18"	660.0	457.0	610
5" x 4"	141.3	114.3	127	28" x 26"	711.0	660.0	610
5" x 3.1/2"	141.3	101.6	127	28" x 24"	711.0	610.0	610
5" x 3"	141.3	88.9	127	28" x 20"	711.0	508.0	610
5" x 2.1/2"	141.3	73.0	127	28" x 18"	711.0	457.0	610
5" x 2"	141.3	60.3	127	30" x 28"	762.0	711.0	610
6" x 5"	168.3	141.3	140	30" x 26"	762.0	660.0	610
6" x 4"	168.3	114.3	140	30" x 24"	762.0	610.0	610
6" x 3.1/2"	168.3	101.6	140	30" x 20"	762.0	508.0	610
6" x 3"	168.3	88.9	140	32" x 30"	813.0	762.0	610
6" x 2.1/2"	168.3	73.0	140	32" x 28"	813.0	711.0	610
8" x 6"	219.1	168.3	152	32" x 26"	813.0	660.0	610
8" x 5"	219.1	141.3	152	32" x 24"	813.0	610.0	610
8" x 4"	219.1	114.3	152	34" x 32"	864.0	813.0	610
8" x 3.1/2"	219.1	101.6	152	34" x 30"	864.0	762.0	610
10" x 8"	273.0	219.1	178	34" x 26"	864.0	660.0	610
10" x 6"	273.0	168.3	178	34" x 24"	864.0	610.0	610
10" x 5"	273.0	141.3	178				
10" x 4"	273.0	114.3	178				

BUTT WELD PIPE FITTINGS



STUBEND



CAP

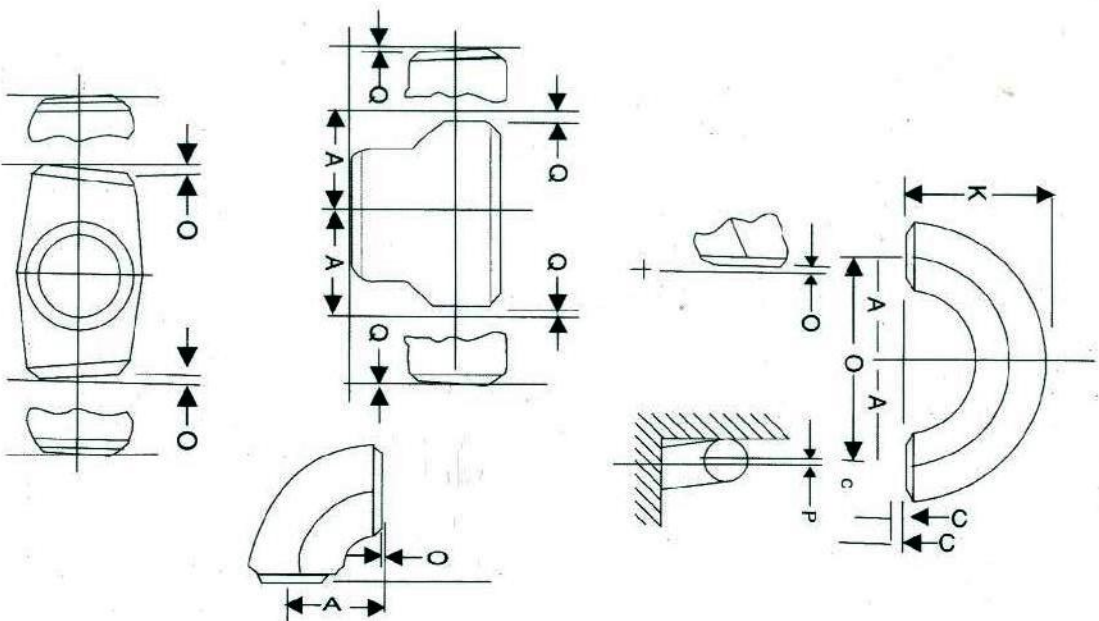
AS PER B 16.9

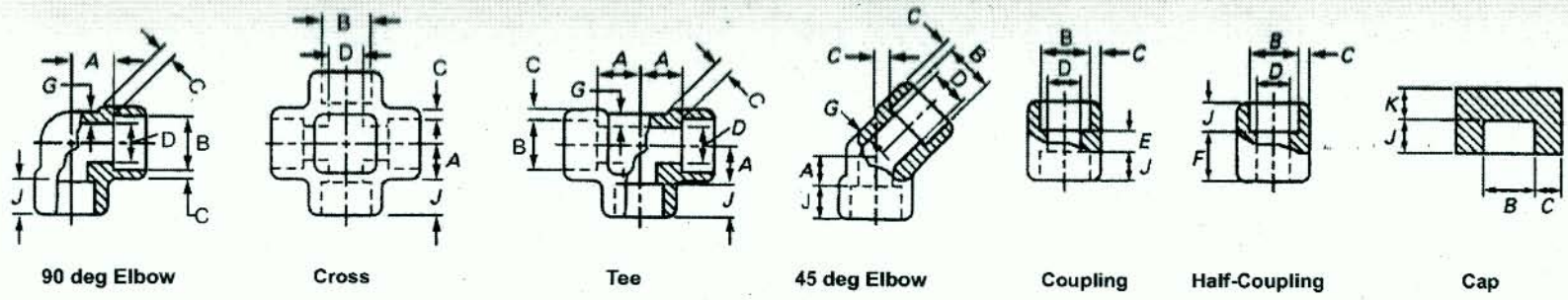
Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)	Long Pattern Length "F"	Short Pattern 'F'	Radius of Follet 'R'	Dia of Lap 'G'	Length 'E'	Limiting Wall Thk For Length 'E'	Length 'E1'
1/2"	21.3	76.0	51	3	35	25	4.57	25
3/4"	26.7	76.0	51	3	43	25	3.81	25
1"	33.4	102.0	51	3	51	38	4.57	38
1 1/4"	42.2	102.0	51	5	64	38	4.83	38
1 1/2"	48.3	102.0	51	6	73	38	5.08	38
2"	60.3	152.0	64	8	92	38	5.59	44
2 1/2"	73.0	152.0	64	8	105	38	7.11	51
3"	88.9	152.0	64	10	127	51	7.62	64
3 1/2"	101.6	152.0	76	10	140	64	8.13	76
4"	114.3	152.0	76	11	157	64	8.64	76
5"	141.3	203.0	76	11	186	76	9.65	89
6"	168.3	203.0	89	13	216	89	10.92	102
8"	219.1	203.0	102	13	270	102	12.7	127
10"	273.0	254.0	127	13	324	127	12.7	152
12"	323.8	254.0	152	13	381	152	12.7	178
14"	355.6	305.0	152	13	413	165	12.7	191
16"	406.4	305.0	152	13	470	178	12.7	203
18"	457.0	305.0	152	13	533	203	12.7	229
20"	508.0	305.0	152	13	584	229	12.7	254
22"	559.0	305.0	152	13	641	254	12.7	254
24"	610.0	305.0	152	13	692	267	12.7	305

**DIMENSIONAL TOLERANCES AS PER ANSI B 16.9/ B 16.28/
 MSS SP -43 BUTT WELD FITTING**

Nominal Pipe Size (NPS)	Angularity - Tail	
	Off Angle Q	Off Plane P
1/2 to 4	1	2
5 to 8	2	4
10 to 12	3	5
14 to 16	3	7
18 to 24	4	10
26 to 30	5	10
32 to 42	5	13
44 to 48	5	20

All Fittings	Outside Diameter at Bewel (1), (2) D	Inside diameter at End (1), (2), (3)	Wall Thickness (3)	0 deg. and 45 deg. elbows and Tees	Reducers & Lap Joints Stub Ends	Caps	180 deg Returns			Lap Joint Stub Ends		
							Center to end Dimension A,B,C,M	Center to Overall Length F,H	Overall Length E	Center to Center Dimension O	Back to Face Dimension K	Alignment of ends U	Outside Diameter of Lap G	Fillet Radius of Lap R	Outside Diameter of Barrel
1/2 to 2/12	1	0.8		2	2	4	7	7	1	+0.1	+0.1	See Table 7 for limiting dimensions
3 to 3/12	1	1.6		2	2	4	7	7	1	+0.1	+0.1	
4	+2 -1	1.6	Not Less than 87.5% of nominal thickness	2	2	4	7	7	1	+0.1	+0.1	
5 to 6	-3 -1	1.6		2	2	7	7	7	1	+0.1	+0.2	
8	+4 -3	1.6		2	2	7	7	7	1	+0.1	+0.2	
10	+4 -3	3.2		2	2	7	10	7	2	+0.2	+0.2	
12 to 18	+4 -3	3.2		2	2	7	10	7	2	+0.2	+0.2	
20 to 24	+6 -5	4.8		3	3	7	10	7	2	+0.2	+0.2	
26 to 30	+7 -5	4.8		3	3	10	-	-	-	-	-	
32 to 48	+7 -5	4.8		5	5	10	-	-	-	-	-	





SOCKET-WELDING FITTINGS AS PER B 16.5

DN	Nominal Pipe Size	Socket Bore Diameter, B [Note (1)]	Bore Diameter of Fittings, D [Note (1)]			Socket Wall Thickness, C [Note (2)]						Body Wall, G			Min. Depth of Socket, J	Center to Bottom of Socket, A						Laying Lengths		Tolerances, ±			End Wall Thickness, K_{min}		
			Class Designation			Class Designation						Class Designation				90 deg Elbows, Tees, and Crosses			45 deg Elbows			Couplings, E	Half Couplings, F	A	E	F	Class Designation		
			3000	6000	9000	3000		6000		9000		3000	6000	9000		Class Designation			3000	6000	9000								
			Avg.	Min.	Avg.	Min.	Avg.	Min.	Min.	Min.	Min.	3000	6000	9000		3000	6000	9000				3000	6000	9000					
6	1/4	11.2 10.8	7.6 6.1	4.8 3.2	3.18	3.18	3.96	3.43	...	...	2.41	3.15	...	9.5	11.0	11.0	...	8.0	8.0	...	6.5	16.0	1.0	1.5	1.0	4.8	6.4	...
8	1/4	14.6 14.2	10.0 8.5	7.1 5.6	3.78	3.30	4.60	4.01	...	...	3.02	3.68	...	9.5	11.0	13.5	...	8.0	8.0	...	6.5	16.0	1.0	1.5	1.0	4.8	6.4	...
10	3/8	18.0 17.6	13.3 11.8	9.9 8.4	4.01	3.50	5.03	4.37	...	...	3.20	4.01	...	9.5	13.5	15.5	...	8.0	11.0	...	6.5	17.5	1.5	3.0	1.5	4.8	6.4	...
15	1/2	22.2 21.8	16.6 15.0	12.5 11.0	4.67	4.09	5.97	5.18	9.35	8.18	3.73	4.78	7.47	9.5	15.5	19.0	25.5	11.0	12.5	15.5	9.5	22.5	1.5	3.0	1.5	6.4	7.9	11.2	
20	3/4	27.6 27.2	21.7 20.2	16.3 14.8	4.90	4.27	6.96	6.04	9.78	8.56	3.91	5.56	7.82	12.5	19.0	22.5	28.5	13.0	14.0	19.0	9.5	24.0	1.5	3.0	1.5	6.4	7.9	12.7	
25	1	34.3 33.9	27.4 25.9	21.5 19.9	5.69	4.98	7.92	6.93	11.38	9.96	4.55	6.35	9.09	12.5	22.5	27.0	32.0	14.0	17.5	20.5	12.5	28.5	2.0	4.0	2.0	9.6	11.2	14.2	
32	1 1/4	43.1 42.7	35.8 34.3	30.2 28.7	6.07	5.28	7.92	6.93	12.14	10.62	4.85	6.35	9.70	12.5	27.0	32.0	35.0	17.5	20.5	22.5	12.5	30.0	2.0	4.0	2.0	9.6	11.2	14.2	
40	1 1/2	49.2 48.8	41.6 40.1	34.7 33.2	6.35	5.54	8.92	7.80	12.70	11.12	5.08	7.14	10.15	12.5	32.0	38.0	38.0	20.5	25.5	25.5	12.5	32.0	2.0	4.0	2.0	11.2	12.7	15.7	
50	2	61.7 61.2	53.3 51.7	43.6 42.1	6.93	6.04	10.92	9.50	13.84	12.12	5.54	8.74	11.07	16.0	38.0	41.0	54.0	25.5	28.5	28.5	19.0	41.0	2.0	4.0	2.0	12.7	15.7	19.0	
65	2 1/2	74.4 73.9	64.2 61.2	...	8.76	7.67	...	...	...	...	7.01	...	...	16.0	41.0	...	...	28.5	...	...	19.0	43.0	2.5	5.0	2.5	15.7	19.0	...
80	3	90.3 89.8	79.4 76.4	...	9.52	8.30	...	...	...	...	7.62	...	...	16.0	57.0	...	...	32.0	...	...	19.0	44.5	2.5	5.0	2.5	19.0	22.4	...
100	4	115.7 115.2	103.8 100.7	...	10.69	9.35	...	...	...	...	8.56	...	...	19.0	66.5	...	...	41.0	...	...	19.0	48.0	2.5	5.0	2.5	22.4	28.4	...

GENERAL NOTE: Dimensions are in millimeters.

NOTES:

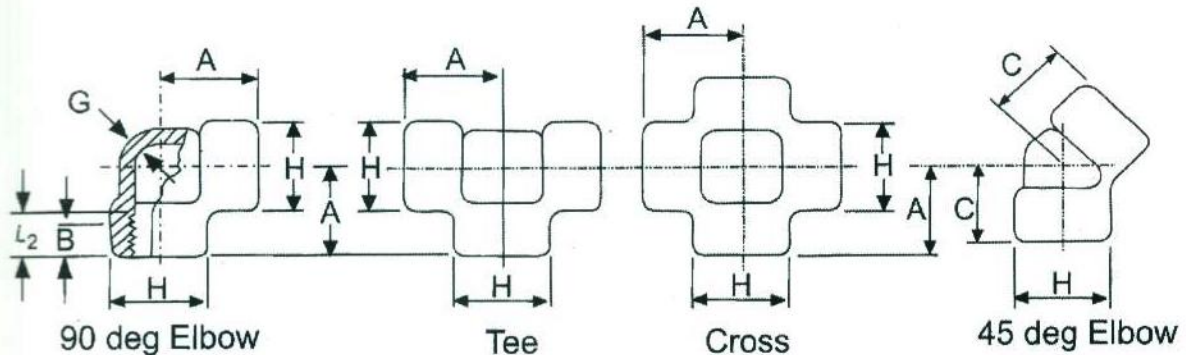
- (1) Upper and lower values for each size are the respective maximum and minimum dimensions.
- (2) Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized area.

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ASME B16.11-2001

ASME B16.11-2001

**FORGED FITTINGS,
SOCKET-WELDING AND THREADED**



FORGED THREADED FITTINGS

DN	Nominal Pipe Size	Center-to-End Elbows, Tees, Crosses, A			Center-to-End 45 deg Elbow, C			Outside Diameter of Band, H			Min. Wall Thickness, G			Min. Length of Thread [Note (1)]	
		2000	3000	6000	2000	3000	6000	2000	3000	6000	2000	3000	6000	B	L ₂
6	1/8	21	21	25	17	17	19	22	22	25	3.18	3.18	6.35	6.4	6.7
8	1/4	21	25	28	17	19	22	22	25	33	3.18	3.30	6.60	8.1	10.2
10	3/8	25	28	33	19	22	25	25	33	38	3.18	3.51	6.98	9.1	10.4
15	1/2	28	33	38	22	25	28	33	38	46	3.18	4.09	8.15	10.9	13.6
20	3/4	33	38	44	25	28	33	38	46	56	3.18	4.32	8.53	12.7	13.9
25	1	38	44	51	28	33	35	46	56	62	3.68	4.98	9.93	14.7	17.3
32	1 1/4	44	51	60	33	35	43	56	62	75	3.89	5.28	10.59	17.0	18.0
40	1 1/2	51	60	64	35	43	44	62	75	84	4.01	5.56	11.07	17.8	18.4
50	2	60	64	83	43	44	52	75	84	102	4.27	7.14	12.09	19.0	19.2
65	2 1/2	76	83	95	52	52	64	92	102	121	5.61	7.65	15.29	23.6	28.9
80	3	86	95	106	64	64	79	109	121	146	5.99	8.84	16.64	25.9	30.5
100	4	106	114	114	79	79	79	146	152	152	6.55	11.18	18.67	27.7	33.0

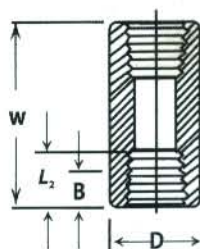
GENERAL NOTE: Dimensions are in millimeters.

NOTE:

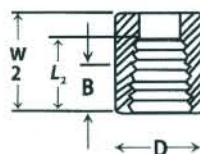
(1) Dimension B is minimum length of perfect thread. The length of useful thread (B plus threads with fully formed roots and flat crests) shall not be less than L₂ (effective length of external thread) required by American National Standard for Pipe Threads (ASME B1.20.1). See Para. 6.3.

**FORGED FITTINGS,
SOCKET-WELDING AND THREADED**

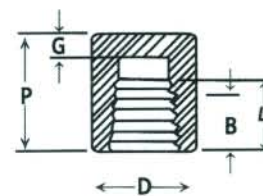
ASME B 16.11-2001



Coupling



Half-Coupling



Cap

DN	Nominal Pipe Size	End - to - End Couplings, W		End - to - End Cops P		Outside Diameter, D		Min. End Wall Thickness, G		Min. Length of Thread [Note (1)]	
		3000	and 6000	3000	6000	3000	6000	3000	6000	B	L ₂
6	1/8	32		19	...	16	22	4.8	...	6.4	6.7
8	1/4	35		25	27	19	25	4.8	6.4	8.1	10.2
10	3/8	34		25	27	22	32	4.8	6.4	9.1	10.4
15	1/2	48		32	33	28	38	6.4	7.9	10.9	13.6
20	3/4	51		37	38	35	44	6.4	7.9	12.7	13.9
25	1	60		41	43	44	57	9.7	11.2	14.7	17.3
32	1 1/4	67		44	46	57	64	9.7	11.2	17.0	18.0
40	1 1/2	79		44	48	64	76	11.2	12.7	17.8	18.4
50	2	80		48	51	76	92	12.7	15.7	19.0	19.2
65	2 1/2	92		60	64	92	108	15.7	19.0	23.6	28.9
80	3	108		65	68	108	127	19.0	22.4	25.9	30.5
100	4	121		68	75	140	159	22.4	28.4	27.7	33.0

GENERAL NOTES:

a) Dimensions are in millimeters.

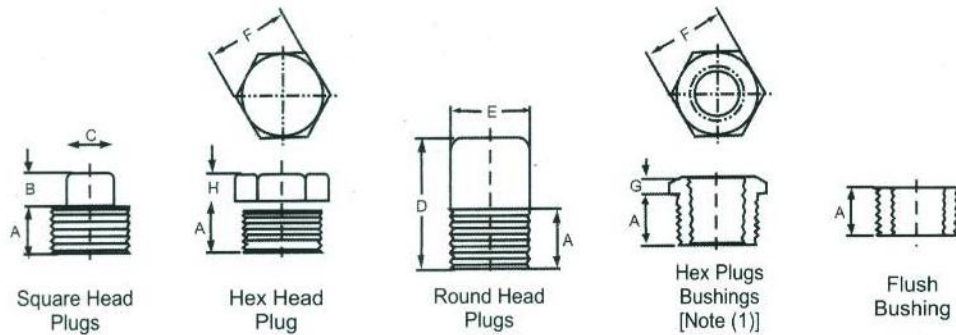
b) Class 2000 and Dn6 Class 6000 couplings, half couplings, and caps are not included in this Standard.

Note:

(1) Dimension B is minimum length of perfect thread. The length of useful thread (B plus thread with fully formed roots and flat crests) shall not be less than L₂ (effective length of extranal thread) required by American National Standard for Pipe Threads (AME B1.20.1.) See para.6.3

ASME B 16.11.2001

**FORGED FITTINGS,
 SOCKET-WELD AND THREAD**



PLUGS AND BUSHINGS

DN	Nominal Pipe Size	Min Length A	Square Head Plugs		Round Head Plugs		Hex Plugs and Bushings		
			Min Square Height B	Min Width Flats C	Nominal Head Diameter, E	Min Length D	Nominal Width Flats, E	Min. Hex Height	
								Bushing G	Plug H
6	1/8	10	6	7	10	35	11	....	6
8	1/4	11	6	10	14	41	16	3	6
10	3/8	13	8	11	18	41	18	4	8
15	1/2	14	10	14	21	44	22	5	8
20	3/4	16	11	16	27	44	27	6	10
25	1	19	13	21	33	51	36	6	10
32	1 1/4	21	14	24	43	51	46	7	14
40	1 1/2	21	16	28	48	51	50	8	16
50	2	22	18	32	60	64	65	9	18
65	2 1/2	27	19	36	73	70	75	10	19
80	3	28	21	41	89	70	90	10	21
100	4	32	25	65	114	76	115	13	25

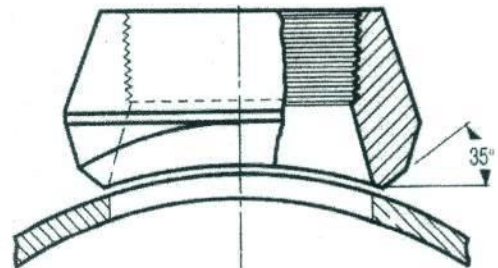
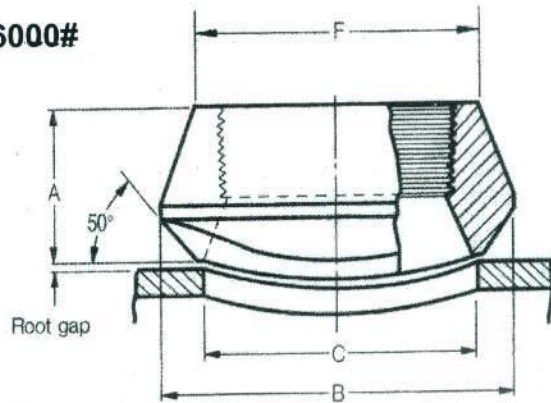
GENERALNOTE: Dimensions are in millimeters.

NOTE:

(1) Cautionary Note Regarding Hex Bushings: Hex head bushings of one-size reduction should not be used in services where they might be subject to harmful loads and forces other than internal pressures.

FORGED STEEL OUTLET FITTINGS SOCKOLETS / THREADOLETS

3000#, 6000#



Outlet Size	A		B		C	
	3000#	6000#	3000#	6000#	3000#	6000#
1/2	25.4	31.8	34.9	44.5	23.8	19.1
3/4	27.0	36.5	44.5	50.8	30.2	25.4
1	33.3	39.7	54.0	61.9	36.5	33.3
1 1/4	33.3	41.3	65.1	69.9	44.5	38.1
1 1/2	34.9	42.9	73.0	82.6	50.8	49.2
2	38.1	52.4	88.9	103.2	65.1	69.9
2 1/2	46.0	-	103.2	-	76.2	-
3	50.8	-	122.2	-	93.7	-
4	57.2	-	152.4	-	120.7	-

Applicable Run Pipe Sizes are From out-Let to 36"

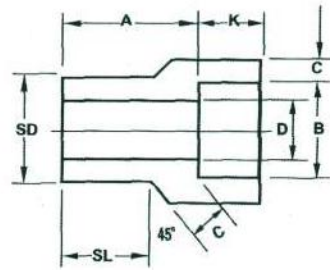
For the 3000# and 6000# Socketlets and Thredolets, Inside Bore, Thread, Socket Bore and Socket depth Dimensions are According to ANSI B16.11

Pipe Schedule Numbers and Weight Designation are in Accordance With ANSI B36.10

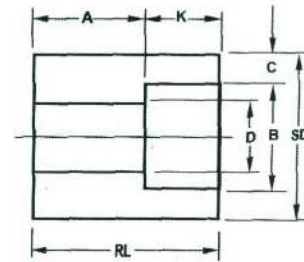
When Ordering Socketlets and Thredolets, Include The Quantity, Run and Out-Let Size, Item And Rating (or Schedule Number) and Material

FORGED STEEL SOCKET WELDING FITTINGS REDUCER INSERT

3000#, 6000#



Type1

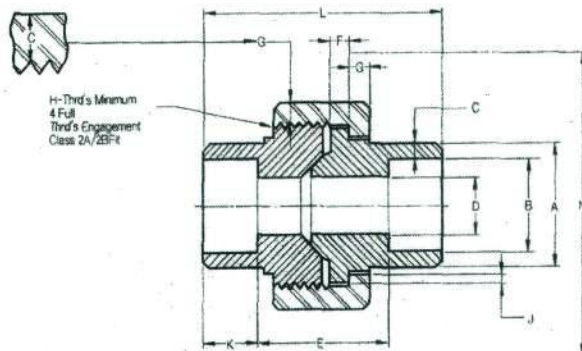


Type2[®]

Nom. Pipe Size	Type		Socket		Shank Dia SD	Laying Length A		Bore D		Wall Min. C		Length Min			
			Dia B	Depth Min. K		3M	6M	3M	6M	3M	6M	3M	6M	SL		RL
	3M	6M			3M									3M	3M
3/8 x 1/4	1	1	14.22	9.52	17.14	19.0	20.6	9.14	6.35	3.78	4.60	14.22	15.75		
1/2 x 3/8	1	1	17.65	9.52	21.34	20.6	22.2	12.45	9.14	4.01	5.03	15.75	17.27		
x 1/4	2	1	14.22	9.52	21.34	15.8	20.6	9.14	6.35	3.78	4.60	17.27	17.27		
3/4 x 1/2	1	1	21.84	9.52	26.67	22.2	25.4	15.75	11.68	4.67	5.97	17.53	19.05		
x 3/8	2	1	17.65	9.52	26.67	15.8	22.2	12.45	9.14	4.01	5.03		19.05	26.92	
x 1/4	2	2	14.22	9.52	26.67	17.5	22.2	9.14	6.35	3.78	4.60			26.92	29.97
1 x 3/4	1	1	27.18	12.70	33.35	23.8	28.5	20.83	15.49	4.90	6.96	19.05	20.57		
x 1/2	2	2	21.84	9.52	33.35	15.8	20.6	15.75	11.68	4.67	5.97		20.57	28.45	
x 3/8	2	2	17.65	9.52	33.35	17.5	22.2	12.45	9.14	4.01	5.03			28.45	33.27
x 1/4	2	2	14.22	9.52	33.35	19.0	23.8	9.14	6.35	3.78	4.60			28.45	33.27
1 1/4 x 1	1	1	33.86	12.70	42.16	25.4	30.2	26.67	20.57	5.69	7.92	20.57	22.35		
x 3/4	2	2	27.18	12.70	42.16	17.5	20.6	20.88	15.49	4.90	6.96			31.75	34.80
x 1/2	2	2	21.84	9.52	42.16	19.0	22.2	15.75	11.68	4.67	5.97			31.75	34.80
x 3/8	2	2	17.65	9.52	42.16	20.6	23.8	12.45	9.14	4.01	5.03			31.75	34.80
x 1/4	2	2	14.22	9.52	42.16	22.2	25.4	9.14	6.35	3.78	4.60			31.75	34.80
1 1/2 x 1 1/4	1	1	42.67	12.70	48.26	28.5	35.1	35.05	29.46	6.07	7.92	22.22	25.40		
x 1	2	1	33.86	12.70	48.26	17.5	28.5	26.67	20.57	5.69	7.92		25.40	33.27	
x 3/4	2	2	27.18	12.70	48.26	19.0	25.4	20.83	15.49	4.90	6.96			33.27	39.62
x 1/2	2	2	21.84	9.52	48.26	20.6	26.9	15.75	11.68	4.67	5.97			33.27	39.62
x 3/8	2	2	17.65	9.52	48.26	22.2	28.5	12.45	9.14	4.01	5.03			33.27	39.62
2 x 1 1/2	1	1	48.77	12.70	60.32	31.7	46.0	40.89	34.04	6.35	8.91	25.40	39.62		
x 1 1/4	2	2	42.67	12.70	60.32	20.6	23.8	34.92	29.46	6.07	7.92			38.10	45.97
x 1	2	2	33.91	12.70	60.32	22.2	25.4	26.67	20.83	5.69	7.92			38.10	45.97
x 3/4	2	2	27.18	12.70	60.32	23.8	26.9	20.83	15.49	4.90	6.96			38.10	45.97
x 1/2	2	2	21.84	9.52	60.32	25.4	28.5	15.87	11.68	4.67	5.97			38.10	45.97

FORGED STEEL SOCKET WELDING FITTINGS UNION

3000#



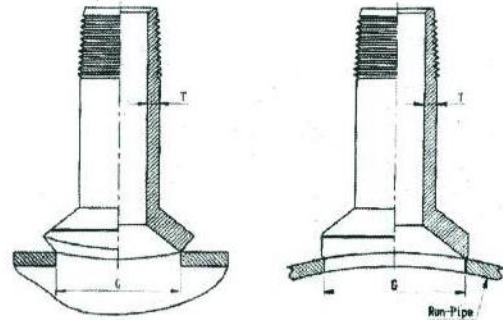
Nom. Pipe Size	Pipe End Min.	Socket Bore Dia.	Socket Wall Min.	Water Way Bore	Laying Length	Male Flange Min.	Nut Min.	Thrds Per 25.4 Max	Bearing Min.	Depth of Socket Min.	Length Assem. Nominal	Clear Assem. Nut
	A	B	C	D	E	F	G	H	J	K	L	N
1/8	21.8	10.92		6.83	22.4							
		10.67	3.17	6.43	19.0	3.17	3.17	16	1.24	9.6	41.1	49.0
1/4	21.8	14.22		9.85	22.4							
		13.97	3.30	9.45	19.0	3.17	3.17	16	1.24	9.6	41.4	49.0
3/8	25.9	17.78		13.92	26.9							
		17.53	3.48	13.51	20.6	3.43	3.43	14	1.37	9.6	46.0	55.0
1/2	31.2	21.84		17.47	26.9							
		21.59	4.06	17.07	20.6	3.68	3.68	14	1.50	9.6	49.0	57.0
3/4	37.1	27.18		21.79	31.8							
		26.92	4.27	21.39	25.4	4.06	4.06	11	1.68	12.7	56.9	67.0
1	45.5	34.04		28.14	34.3							
		33.78	4.95	27.74	26.2	4.57	4.44	11	1.85	12.7	62.0	79.0
1 1/4	54.9	42.67		35.76	40.6							
		42.42	5.28	35.36	32.5	5.33	5.21	11	2.13	12.7	71.1	94.0
1 1/2	61.5	48.77		41.61	42.2							
		48.51	5.54	41.20	34.0	5.84	5.59	10	2.31	12.7	76.5	111.0
2	75.2	61.47		52.53	45.5							
		61.21	6.05	52.12	37.3	6.60	6.35	10	2.69	15.8	86.1	132.0
2 1/2	91.7	74.17		64.72	61.7							
		73.66	7.65	64.31	52.1	7.49	7.11	8	3.07	15.8	102.4	148.0
3	109.2	90.17		77.67	63.8							
		89.66	8.31	77.27	53.6	8.25	8.00	8	3.53	15.8	109.0	175.0

FORGED STEEL OUTLET FITTINGS NIPPOLETS

3000#

(in millimeters)

Run-Pipe Size	Outlet Size	Wall-T	G	Unit Weight (kg)
36-3/4	1/2	7.3	23.9	0.36
36-1	3/4	7.9	30.2	0.56
36-1 1/4	1	8.9	36.6	0.84
36-1 1/2	1 1/4	9.7	44.5	1.22
36-2	1 1/2	10.2	50.8	2.00
36-2 1/2	2	11.2	65.0	3.12

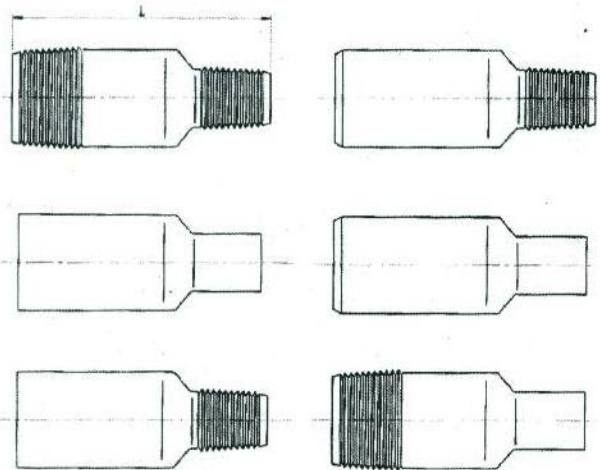


MSS SP- 97

SWAGED NIPPOLETS

(in millimeters)

Large and Size	Small and Size	Length-L
1/2	3/8-1/8	70
3/4	1/2-1/8	76
1	3/4-1/8	89
1 1/4	1 - 1/8	102
1 1/2	1 1/4-1/8	114
2	1 1/2-1/8	165
2 1/2	2-1/8	178
3	2 1/2-1/8	203
3 1/2	3-1/8	203
4	3 1/2-1/8	229

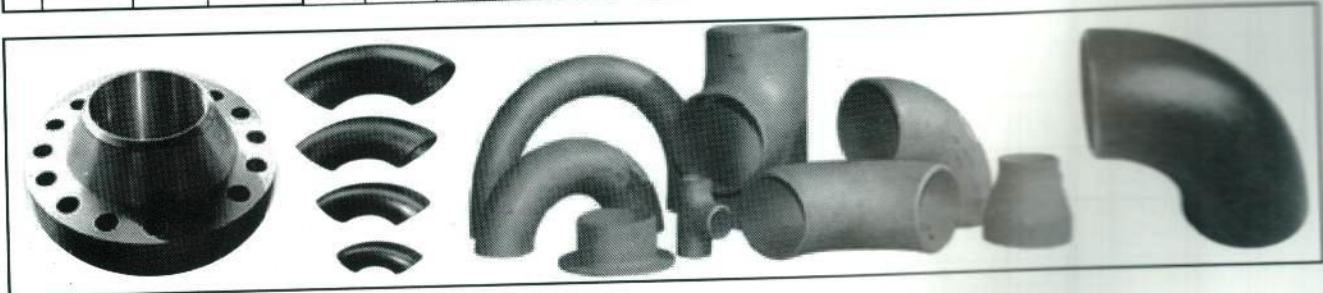


MSS SP-95

- TBE Threaded both end
- PBE Plain both end
- PLE/TSE Plain large end-Threaded small end
- BLE/TSE Beveled large end - Threaded small end
- BLE/PSE Beveled large end - Plain small end
- TLE/PSE Threaded large end - Plain small end

MATERIALS CHEMICAL COMPOSITION & MECHANICAL PROPERTIES

Steel type	ASTM Grade	C% max	Mn%	Chemical composition							Mechanical properties					
				P% max	S% max	Si%	Cr%	Mo%	Ni%	Others	R.min. Tensile Strength MPa	S.min. Yield Strength MPa	A% min.(2" /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	-10°C 17.6/13.6	
	WP1	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	0.3-0.8	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	-	
A234	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	0.5-0.2	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	-	
	WP22CL3	0.05-0.15	0.3-0.6	0.04	0.04	0.5	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=0.08-0.10 Ni=0.03-0.07 Al=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	-	515	205	28	20	-	
WP316		0.08	2	0.045	0.03	1	18-20	2.0-3.0	11.0-14.0	-	515	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%	515	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=10xC max 0.10%	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=8xC max 0.10%	515	205	28	20	-	
WPS 31254		0.02	1	0.03	0.01	0.8	19.5-20.5	6.0-6.5	17.5-18.5	N=0.18-0.22 Cu=0.5-1.0	515	205	28	20	-	
A815	S 31803	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. Al+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 & Aluminium 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.

TEE STRAINERS :

PERFECTT Tee Strainer is custom fabricated to remove solids form Pipe Line where a Compact accessible strainer is needed for protection of pumps, Valves, and other similar equipment .Tee Strainer is fabricated from pipes and plates or equal Tee and Flange. Strainer made of CS and SS. Strainer Elements are made of SS perforated sheet & wire mesh.



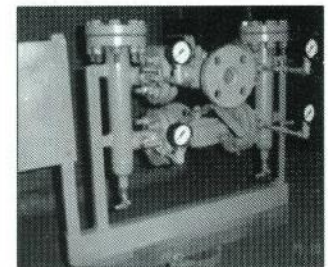
Y -TYPE STRAINERS :

PERFECTT strainers are named after their shape. Y Strainers are your most economical choice for large debris removal. It helps in the removal of foreign bodies in pipe line and use line trouble free service and freedom costly repairs or replacement for large area straining perforated screen lined with wire mesh can be used. They are used in high temperature and pressure lines gas or liquid and even in suction areas. The screening element or "leg" must be on the "downside" of the strainer body so that entrapped solids can be properly collected.



BASKET TYPE STRAINERS :

PERFECTT Basket type Strainers are used to filter foreign matter from Pipe Line by using screen removable from top. The screen is in the form of a basket with a lifting handle. All the clogged material retained by the screen can be easily removed and made ready for next change over. They are available in variety of materials and finds application in various chemical process industry. They are designed for application where easy maintenance and large capacity straining area are needed. Most models have standard or optional "Quick Release Cover" to allow fast and easy screen removal without the use of tools. For easily flushable solids, a modified cone-bottom basket can be fitted, with automatic or manual blow-down through the drain port. This will allow clean-out without removal of the screen, and without interrupting the process flow.



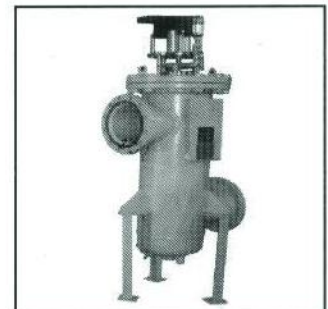
DUPLEX STRAINERS - BASKET TYPE:

PERFECTT Duplex Filters provide ease of cleaning the element without interruption to the process where the flow cannot be shut down for cleaning the screen. Change over is accomplished by use of butterfly valves or three way Ball Valve. Duplex Strainers feature a single shaft drive to operate the flow diverter valves Baskets are gasketed and surely positioned to prevent particles by - pass. They are available in fabricated and cast construction. Manual change over and automatic change over is possible in Duplex Strainer.



SELF CLEANING / AUTOMATIC SCRAPER STRAINERS

PERFECTT Automatic Scraper Strainer is a motorized unit designed for the continuous removal of suspended solids from process and wastewater flows. These strainers can handle heavy solids size upto 150mm dia stone. Cleaning is done by a spring-loaded blade and brush fully automatic control system. A separate blowdown timer allows the accumulated solids to be discharged from the bottom of the strainer where they are collected during scraping cycle. The strainers are available in sizes upto 36" infabricated construction.



**FABRICATED STRAINERS
QUALITY ASSURANCE PLAN**

QAP NO. : QP / 001 Rev 0)

Sl.No.	Component / Operation	Characteristics	Classification	Quantum of Check	Type of Check	Ref. Document	Acceptance Norms	Format of Record	Agency		
									I	II	III
1	2	3	4	5	6	7	8	9	10		
1.0 MATERIAL											
1.1	Connection Flanges	Mechanical & Chemical Properties	Major	Lot	Mechanical & Chemical Analysis	Customer Approved Drawing & Data Sheet	Same as Column No. 7	Mechanical & Chemical Test Report	R		R
1.2	Casing Top & Cover Flanges										
1.3	Connection Pipe										
1.4	Casing Pipe										
1.5	Perforated Sheet / Mesh	Chemical (S.S.)	Major	1 Lot	Chemical Analysis	ASTM	Same as Column No. 7	Chemical Analysis Report	R		R
1.6	Perforated Sheet / Mesh	(Hole Size) dimensional & Mechanical Properties	Major	1 Lot	(Hole Size) dimensional Report, Tensile test			Manufacturer Standard	R		R
2.0 IN PROCESS INSPECTION											
2.1	Components	Dimensions / Finish	Major	100%	Measurement / Visual	Manufacturer Drawing	Same as Column No. 7	Internal Inspection Report	D		
2.2	Surface Preparation	Cleaning, Deburring	Major	100%	Visual	Manufacturer Standard	Same as Column No. 7	Internal Inspection Report	V		
2.3	Assembly	Dimensional Check	Major	100%	Measurement	Customer Approved Drawing	Same as Column No. 7	Internal Inspection Report	D		
2.4	Welding	Welder's Qualification/ Records	Major	100%	DP Test	WPQ	ASME Sec IX	Internal Inspection Report	W		R
3.0 ASSEMBLY TESTING											
3.1	Flow Test (Internal Pressure)	Capability to withstand Internal Pressure	Critical	100%	Hydro Test	Customer approved drg.	Same as Column No. 7	Internal Inspection Report	P		W
3.2	Flow Test (External Pressure)	Capability to withstand External Pressure	Major	100%	Vacuum Test	Customer approved drg.	Same as Column No. 7	Internal Inspection Report	P		W
3.3	Performance Test	Pressure Loss (?p - Q)	50% Clogging	One/ Lot	Type Test (Model Test)	Internal Inspection Report	Same as Column No. 7	Internal Inspection Report	P		R
3.4	Final Assy	Packing	Major	100%	Visual	Manufacturer Standard Procedure	Same as Column No. 7	Internal Inspection Report			
4.0 PAINTING											
4.1	Surface Preparation	Cleaning Surface	Major	100%	Visual	Manufacturer Drawing	Same as Column No. 7	Internal Inspection Report	P		
4.2	Primary Painting	Uniformity	Major	100%	Visual	Manufacturer Drawing	Same as Column No. 7		P		
4.2	Finish Painting	Uniformity	Major	100%	Visual	Manufacturer Drawing	Same as Column No. 7		P		V

LEGEND:

I = Manufacturer
V = Visual Inspection

II = Client
R = Document Review

III = Inspection Agency
W = Witness

D = Dimension Checking

P = PERFORMED BY

PERFECTT SERVICES [MADRAS]				QUALITY ASSURANCE PLAN					Doc. No. : PSM/776/09-10			
				Project:				Date				
# 28/2, Jones Street, Chennai - 600 001				Client :				Revision:				
Item:	CS FLANGES A105 BLRF/SORF/WNRF/SWRF			Contractor				P.O. No.				
				Insp. By:				Date				
Sl.No.	Component & Operation	Specific-ation	Characteristics checked	Category	Type/Method Checked	Quantum of Check	Reference Document	Format of Record	Agency			Remarks
									PSM	TPI	CLIENT	
01	02		03	04	05	06	07	09	10	11	12	13
01	Forged Blank for Flange	SA 105	Mechanical Properties (TS, YS, EL%)	Major	Mech. Testing	1 test piece per lot	ASME Sec. VIII	Mech. Test Report/ Work Test Certificate	W	R	R*	
			Chemical Compostion	Major	Chem. Analysis				W	R	R*	
			Hardness	Major	Hardness Test				W	R	R*	
02	Finish Flange	ANSI B 16.5 Class 150,	Forging defect/Crack	Major	Ultrasonic Testing	10% per lot	AM 203.2	W.T.C *& Ultrasonic Report	W	R	R*	
			Clean Surface & Check Visual	Major	Visual	10%						
03	Final Inspection	125AARH	Dimension, Marking	Major	Visual/ Measurement	10%	P.O.	Dimensional Report format	W	W	R*	
04	Marking, Dispatch	-	Visual	Major	Visual	100%	P.O.	Packing List	W	W	R*	
Abb. : PS: M/s. Perfectt Services (Madras); TC : Test Certificate, W = Witness R= Review * Documents/Reports to be furnished. * W.T.C = Works Test Certificates												
Prepared by:				Reviewed by				Approved by				
Perfectt Services (Madras)												

PERFECTT SERVICES [MADRAS]				QUALITY ASSURANCE PLAN					Doc. No. :	PSM/I		
# 28/2, Jones Street, Chennai - 600 001				Project :					Date			
Item : Carbon Steel Butt Weld Fittings				Client :					Revision :			
				PMC :					P.O. No.			
				Insp. By :					Date			
Sl. No.	Component & Operation	Specification	Characteristics checked	Category	Type/Method Checked	Quantum of Check	Reference Document	Format of Record	Agency			Remarks
									PSM	TPI	client	
01	02		03	04	05	06	07	09	10	11	12	13
01	Seamless Pipe	A 106 Gr. B	Dimension	Major	Measurement	100%	PO/ A 106 Gr. B	Mech. Test Report/Work Test Certificate	W	R	R*	
			Mech. Properties (TS, YS, EL%)	Major	Mech. Testing	1 test piece per lot/ per heat			W	R	R*	
			Chemical Composition	Major	Chem. Analysis				W	R	R*	
02	Formed Fitting		Mech. Properties	Major	-	1 test piece per heat No.	TC Review	-do-	W	R	R*	
			Hardness	Major	Hardness Testing		P.O. Specification	-do-				
03	Finished Fittings	SA 234, Gr. WPB	Cracks	Major	Ultrasonic Testing	10% per lot	ASME Sec VIII AM 203.2	W.T.C. & Ultrasonic Report	W	R	R*	
			Clean Surface & Check Visual	Major	Visual	100%						
04	Final Inspection	ANSI B 16.9	Visual Dimension & Marking	Major	Visual / Measurement	100%	P.O.	Dimensional Report format	W(10%)	W	R*	Identification mark of to be specified
05	Marking	-	Visual	Major	Visual	100%	P.O.	Packing List	W(10%)	W	R*	
06	Final Documentation / Issue of Inspection Certificate / Dispatch	PO / PR	Completeness	Major	Visualise	100%	PO / PMS	MTC / Report / IRN	W	H*	R*	*Ref. : TPI
Abb. :				PS: M/s. Perfectt Services (Madras); TC : Test Certificate,								
				W = Witness R = Review H = Hold * Documents/Reports to be furnished.								
Prepared by :				Reviewed by				Approved by				
Perfectt Services (Madras)												

NOTE :- STOCK FITTINGS : RANDOM SAMPLES TO BE TAKEN FOR CHECK TEST FOR PHYSICAL & CHEMICAL. PHYSICAL WITNESSED BY TPIA.

PERFECTT SERVICES [MADRAS]				QUALITY ASSURANCE PLAN					Doc. No. :		PSM/2	
# 28/2, Jones Street, Chennai - 600 001				Project :					Date			
				Client :					Revision :			
Item : C.S. FORGED SW FITTINGS				PMC :					P.O. No.			
				Insp. By :					Date			
Sl. No.	Component & Operation	Specification	Characteristics checked	Category	Type/Method Checked	Quantum of Check	Reference Document	Format of Record	Agency			Remarks
									PSM	TPI	CLIENT	
01	02		03	04	05	06	07	09	10	11	12	13
01	Raw Material INGOT / BILLET / BLOOM	SA 105	Mechanical Properties (TS, YS, EL%)	Major	Mech. Testing	1 test piece per lot/ per heat	PO/ As per ASME SA 105	Mech. Test Report/Work Test Certificate	W	R	R*	
			Chemical Composition	Major	Chem. Analysis				W	R	R*	
			Hardness	Major	Hardness Test					R	R*	
02	In Process 1. Cuttings & Forging 2. Heat treatment	B16.11	Forging defect/Crack	Major	Ultrasonic Testing	10% per heat	Supplier forging procedure	M.T.C. & Ultrasonic Report HT Chart	W	R	R*	
			Hardness	Major	Major	1% per heat						
			Clean Surface & Check Visual	Major	Visual	100%						
03	Final Inspection	SA 105	Chemical checking	Major	Chemical Approved	1% per heat Random	Original MTC	MTC	W	W(10%)	R*	Identification mark of .....to be specified.
		Visual Dimensional	Dimension, Marking	Major	Visual / Measurement	100%	P.O.	Dimensional Report format				
04	Marking	Visual	Visual	Major	Visual	100%	P.O.	Packing List	W	W(10%)	R*	
05	Final Documentation / Issue of Inspection Certificate / Dispatch	PO/PR	Completeness	Major	Visual	100%	PO / PMS	MTC / Report / IRN	W	H*	R*	*Ref. : TPI
Abb. :				PS: M/s. Perfectt Services (Madras); TC : Test Certificate,								
				W = Witness R = Review H = Hold * Documents/Reports to be furnished.								
Prepared by :				Reviewed by				Approved by				
Perfectt Services (Madras)												

NOTE :- STOCK FITTINGS : RANDOM SAMPLES TO BE TAKEN FOR CHECK TEST FOR PHYSICAL & CHEMICAL. PHYSICAL WITNESSED BY TPIA.

PERFECTT SERVICES [MADRAS]				QUALITY ASSURANCE PLAN					Doc. No. :	PSM/3		
# 28/2, Jones Street, Chennai - 600 001				Project :					Date			
				Client :					Revision :			
Item : Alloy Steel Butt Weld Fittings				PMC :					P.O. No.			
				Insp. By :					Date			
Sl. No.	Component & Operation	Specification	Characteristics checked	Category	Type/Method Checked	Quantum of Check	Reference Document	Format of Record	Agency			Remarks
									PSM	TPI	Client	
01	02		03	04	05	06	07	09	10	11	12	13
01	Seamless Pipe	A335 P11	Dimension	Major	Measurement	100%	A335 P11	Mech. Test Report/Work Test Certificate	W	R	R*	
			Mech. Properties (TS, YS, EL%)	Major	Mech. Testing	1 test piece per lot			W	R	R*	
			Chemical Composition	Major	Chem. Analysis				W	R	R*	
02	Formed Fitting	-	Mech. Properties	Major	-	1 test piece per heat No.	TC Review	-do-	W	R	R*	
			Hardness	Major	Hardness Testing		P.O. Specification	-do-	W	R	R*	
03	Finished Fittings	SA 234, Gr. WP11	Cracks	Major	Ultrasonic Testing	10% per lot	AM 203.2	W.T.C. & Ultrasonic Report	W	R	R*	
			Clean Surface & Check Visual	Major	Visual	100%			W	R	R*	
04	Finished Fittings (PMI)	SA 234, Gr. WP11	X-Ray Fluorescence / Optical Emission Analyser	Major	Visual	100%	Toyo Spec.	PMI Report	W	W	R*	
05	Final Inspection		Visual Dimension & Marking	Major	Visual / Measurement	100%	P.O.	Dimensional Report format	W	W	R*	Identification mark of to be specified
06	Marking	-	Visual	Major	Visual	100%	P.O.	Packing List	W	W	R*	
07	Final Documentation / Issue of Inspection Certificate / Dispatch	PO/PR	Completeness	Major	Visual	100%	PO / PMS	MTC / Report / IRN	W	H*	R*	*Ref. : TPI
Abb. :				PS: M/s. Perfectt Services (Madras); TC : Test Certificate,								
				W = Witness R = Review H = Hold * Documents/Reports to be furnished.								
Prepared by :				Reviewed by				Approved by				
Perfectt Services (Madras)												

NOTE :- STOCK FITTINGS : RANDOM SAMPLES TO BE TAKEN FOR CHECK TEST FOR PHYSICAL & CHEMICAL. PHYSICAL WITNESSED BY TPIA.

PERFECTT SERVICES [MADRAS]				QUALITY ASSURANCE PLAN					Doc. No. :		PSM/4	
				Project :	Date			Revision :		P.O. No.		Date
# 28/2, Jones Street, Chennai - 600 001				Client :								
Item : A. S. FORGED S/W FITTINGS				PMC :								
				Insp. By :								
Sl. No.	Component & Operation	Specification	Characteristics checked	Category	Type/Method Checked	Quantum of Check	Reference Document	Format of Record	Agency			Remarks
									PSM	TPI	CLIENT	
01	02		03	04	05	06	07	09	10	11	12	13
01	Raw Material INGOT / BILLET / BLOOM	A182 F11	Mechanical Properties (TS, YS, EL%)	Major	Mech. Testing	1 test piece per lot	As per ASME A182 F11	Mech. Test Report/Work Test Certificate	W	R	R*	
			Chemical Composition	Major	Chem. Analysis				W	R	R*	
			Hardness	Major	Hardness Test					R	R*	
02	In Process 1. Cuttings & Forging 2. Heat treatment	B16.11	Forging defect/Crack	Major	Ultrasonic Testing	10% per heat	Supplier forging procedure	M.T.C. & Ultrasonic Report		R	R*	
			Hardness	Major	Major	1% per heat						
			Clean Surface & Check Visual	Major	Visual	100%						
03	Finished Fittings (PMI)	A182 F11	X-Ray Fluorescence / Optical Emission Analyser	Major	Visual	100%	Toyo Spec.	PMI Report	W	W	R*	
04	Final Inspection	A182 F11	Chemical checking	Major	Chemical Approved	1% per heat Random	Original MTC	MTC		W	R*	Identification mark of .....to be specified.
		Visual Dimensional	Dimension, Marking	Major	Visual / Measurement	100%	P.O.	Dimensional Report format				
05	Marking	Visual	Visual	Major	Visual	100%	P.O.	Packing List	W	W	R*	
06	Final Documentation / Issue of Inspection Certificate / Dispatch	PO/PR	Completeness	Major	Visual	100%	PO / PMS	MTC / Report / IRN	W	H*	R*	*Ref. : TPI
Abb. :				PS: M/s. Perfectt Services (Madras); TC : Test Certificate,								
				W = Witness R = Review H = Hold * Documents/Reports to be furnished.								
Prepared by :				Reviewed by				Approved by				
Perfectt Services (Madras)												

NOTE :- STOCK FITTINGS : RANDOM SAMPLES TO BE TAKEN FOR CHECK TEST FOR PHYSICAL & CHEMICAL. PHYSICAL WITNESSED BY TPIA.

WALL THICKNESSES OF PIPES

Nom Pipe Size	Nom Out Dia	NOMINAL WALL THICKNESS												Nom Pipe Size		
		Sch 10	Sch 20	Sch 30	STD Wall	Sch 40	Sch 60	EXT Hby	Sch 80	Sch 100	Sch 120	Sch 140	Sch 160		XX Hby	
1/2	0.840	.083	-	-	.109	.109	-	.147	.147	-	-	-	-	.188	.194	1/2
3/4	1.050	.083	-	-	.113	.113	-	.154	.154	-	-	-	-	.219	.208	3/4
1	1.315	.109	-	-	.133	.133	-	.179	.179	-	-	-	-	.250	.358	1
1 1/4	1.660	.109	-	-	.140	.140	-	.191	.191	-	-	-	-	.250	.382	1 1/4
1 1/2	1.900	.109	-	-	.145	.145	-	.200	.200	-	-	-	-	.281	.400	1 1/2
2	2.375	.109	-	-	.154	.154	-	.218	.218	-	-	-	-	.344	.436	2
2 1/2	2.875	.120	-	-	.203	.203	-	.276	.276	-	-	-	-	.375	.552	2 1/2
3	3.500	.120	-	-	.216	.216	-	.300	.300	-	-	-	-	.438	.600	3
3 1/2	4.000	.120	-	-	.226	.226	-	.318	.318	-	-	-	-	-	.636	3 1/2
4	4.500	.120	-	-	.237	.237	-	.337	.337	-	-	.438	-	.531	.674	4
5	5.563	.134	-	-	.258	.258	-	.375	.375	-	-	.500	-	.625	.750	5
6	6.625	.134	-	-	.280	.280	-	.432	.432	-	-	.562	-	.719	.864	6
8	8.625	.148	.250	.277	.322	.322	.406	.500	.500	.594	.719	.812	.906	.875	8	
10	10.75	.165	.250	.307	.365	.365	.500	.594	.594	.719	.844	1.000	1.125	1.000	10	
12	12.75	.180	.250	.330	.375	.406	.562	.688	.688	.844	1.000	1.125	1.312	1.000	12	
14	14.00	.250	.312	.375	.375	.438	.594	.750	.750	.938	1.094	1.250	1.406	-	14	
16	16.00	.250	.312	.375	.375	.500	.656	.844	.844	1.031	1.219	1.438	1.594	-	16	
18	18.00	.250	.312	.438	.375	.562	.750	.938	1.156	1.375	1.562	1.781	-	-	18	
20	20.00	.250	.375	.500	.375	.594	.812	1.031	1.281	1.500	1.750	1.969	-	-	20	
22	22.00	.250	-	-	.375	-	.500	-	-	-	-	-	-	-	22	
24	24.00	.250	.375	.562	.375	.688	.969	1.219	1.531	1.812	2.062	2.344	-	-	24	
26	26.00	-	-	-	.375	-	.500	-	-	-	-	-	-	-	26	
30	30.00	.312	.500	.625	.375	-	.500	-	-	-	-	-	-	-	30	
36	36.00	.312	.500	.625	.375	.750	.500	-	-	-	-	-	-	-	36	
40	40.00	-	-	-	.375	-	.500	-	-	-	-	-	-	-	40	
42	42.00	-	-	-	.375	-	.500	-	-	-	-	-	-	-	42	
48	48.00	-	-	-	.375	-	.500	-	-	-	-	-	-	-	48	

Dimensions are in inches.

Light Wall thicknesses are identical to stainless steel Schedule 10S in sizes thru 12", and to Schedule 10 in sizes 14" and larger.

Standard Wall thicknesses are identical to stainless steel Schedule 40S in sizes thru 12", Extra Heavy Wall thicknesses are identical to stainless steel Schedule 80S in sizes thru 12".

Other types, sizes, and thicknesses of flanges can be provided to meet application.

Stocked and manufactured in carbon steel, stainless steel, and a variety of other metals and alloys.

Inside pipe diameters are provided on the following page.

www.perfecttservices.com

PERFECTT SERVICES (MADRAS)

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