



PIPE

FITTINGS

FLANGES



Guide to Pipe and Fittings

Pipe Tolerances

Pipe Weights & Dimensions

Flange & Fitting Dimensions

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ASTM A999/A999M-12

Standard Specification for Alloy and Stainless Pipe

16. Straightness

16.1 The finished pipe shall be reasonably straight.

16.2 For metal-arc welded pipe, the maximum deviation from a 10-ft [3.0-m] straight edge placed so that both ends are in contact with the pipe shall be 1/8 in. [3.2 mm]. For metal-arc welded pipe with lengths shorter than 10 ft. [3.0 m], this maximum deviation shall be prorated with respect to the ratio of the actual length to 10 ft. [3.0 m].

ASTM A999/A999M - 12

Standard Specification for General Requirements for Alloy Stainless Steel Pipe

Table 1-Permissible Variations in Outside Diameter

NPS / DN Designator	Over (inches)	Over (mm)	Under (inches)	Under (mm)
1/8" to 1 1/2" incl (6mm to 40mm)	0.015	0.4	0.031	0.8
Over 1 1/2" to 4" incl (40mm to 100mm)	0.031	0.7	0.031	0.8
Over 4" to 8" incl (100mm to 200mm)	0.062	1.6	0.031	0.8
Over 8" to 18" incl (200mm to 450mm)	0.093	2.4	0.031	0.8
Over 18" to 26" incl (450mm to 650mm)	0.125	3.2	0.031	0.8
Over 26" to 34" incl (450mm to 850mm)	0.156	4.0	0.031	0.8
Over 34" to 48" incl (850mm to 1200mm)	0.187	4.8	0.031	0.8

Minimum Wall thickness on inspection for nominal (average) pipe wall thickness is covered under Appendix X1. of ASTM A999/A999m – 12

The following equation, may be applied to calculate minimum wall thickness from nominal (average) wall thickness:

$$tn \times 0.875 = tm$$

where:

tn = nominal (average) wall thickness,

and

tm = minimum wall thickness

The nominal plain end mass, in kilograms per meter, is calculated using the following formula:

$$Wpe = 0.0246615(D - t)t$$

where:

D = outside diameter to the nearest 0.1 mm for outside diameters that are 16 in. (406.4 mm) and smaller and to the nearest 1.0 mm for outside diameters larger than 16 in. (406.4mm) (the symbol D is to be used for OD only in mathematical equations or formulas)

and;

Wpe = nominal plain end mass, rounded to the nearest 0.01 kg/m

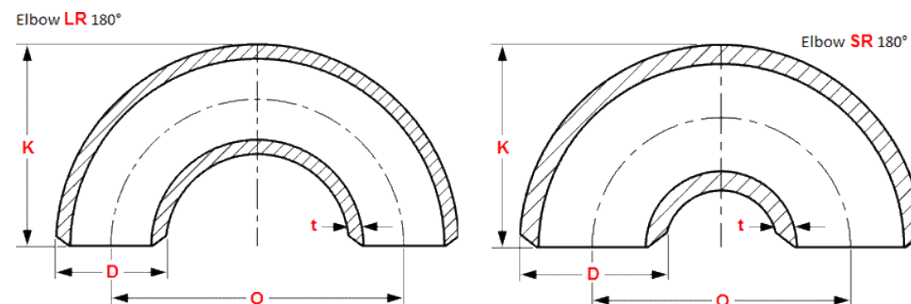
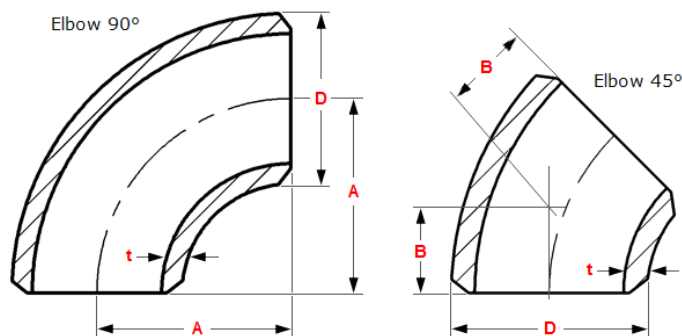
and;

t = specified wall thickness, rounded to the nearest 0.01 mm

Please note that the relevant standard must be checked for specific information in each situation. All contents of this document are a guide only.

Nominal Size		OD	Welded & Seamless Wrought Steel Pipe to ASME B36.10M (Weights are in kg/Lm)																
			Welded & Seamless Wrought Stainless Steel Pipe to ASME B36.19M (Weights are in kg/Lm)																
DN	NPS	mm	Schedule																
			5S	10S	10	20	30	40S	STD	40	60	80S	XS	80	100	120	140	160	XXS
6	1/8	10.3	-	0.28	0.28	-	0.32	0.37	0.37	0.37	-	0.47	0.47	0.47	-	-	-	-	-
8	1/4	13.7	-	0.49	0.49	-	0.54	0.63	0.63	0.63	-	0.80	0.80	0.80	-	-	-	-	-
10	3/8	17.1	-	0.63	0.63	-	0.70	0.84	0.84	0.84	-	1.10	1.10	1.10	-	-	-	-	-
15	1/2	21.3	0.80	1.00	1.00	-	1.12	1.27	1.27	1.27	-	1.62	1.62	1.62	-	-	-	1.95	2.55
20	3/4	26.7	1.02	1.28	1.28	-	1.44	1.69	1.69	1.69	-	2.20	2.20	2.20	-	-	-	2.90	3.64
25	1	33.4	1.29	2.09	2.09	-	2.18	2.50	2.50	2.50	-	3.24	3.24	3.24	-	-	-	4.24	5.45
32	1 1/4	42.2	1.65	2.69	2.69	-	2.87	3.39	3.39	3.39	-	4.47	4.47	4.47	-	-	-	5.61	7.77
40	1 1/2	48.3	1.90	3.11	3.11	-	3.54	4.05	4.05	4.05	-	5.41	5.41	5.41	-	-	-	7.25	9.55
50	2	60.3	2.39	3.93	3.93	-	4.48	5.44	5.44	5.44	-	7.48	7.48	7.48	-	-	-	11.11	13.44
65	2 1/2	73.0	3.69	5.26	5.26	-	8.04	8.63	8.63	8.63	-	11.41	11.41	11.41	-	-	-	14.92	20.39
80	3	88.9	4.52	6.46	6.46	-	9.92	11.29	11.29	11.29	-	15.27	15.27	15.27	-	-	-	21.35	27.68
90	3 1/2	101.6	5.18	7.41	7.41	-	11.41	13.57	13.57	13.57	-	18.64	18.64	18.64	-	-	-	-	-
100	4	114.3	5.84	8.37	8.37	-	12.91	16.08	16.08	16.08	-	22.32	22.32	22.32	-	28.32	-	33.54	41.03
125	5	141.3	9.46	11.56	11.56	-	-	21.77	21.77	21.77	-	30.97	30.97	30.97	-	40.28	-	49.12	57.43
150	6	168.3	11.31	13.83	13.83	-	-	28.26	28.26	28.26	-	42.56	42.56	42.56	-	54.21	-	67.57	79.22
200	8	219.1	14.78	19.97	19.97	33.32	36.81	42.55	42.55	42.55	53.09	64.64	64.64	64.64	75.92	90.44	100.93	111.27	107.93
250	10	273.1	22.61	27.79	27.79	41.77	51.03	60.31	60.31	60.31	81.56	81.56	81.56	96.02	114.76	133.06	155.16	172.34	155.16
300	12	323.9	31.25	35.99	35.99	49.73	65.20	73.88	73.88	79.73	108.96	97.47	97.47	132.09	159.92	186.98	208.15	238.78	186.98
350	14	355.6	34.34	41.36	54.69	67.91	81.33	81.33	81.33	94.55	126.72	107.4	107.4	158.11	194.98	224.66	253.58	281.72	-
400	16	406.4	41.56	47.34	62.65	77.83	93.27	93.27	93.27	123.31	160.13	123.31	123.31	203.54	245.57	286.66	333.21	365.38	-
450	18	457	46.79	53.31	70.57	87.71	122.38	105.17	105.17	155.81	205.75	139.16	139.16	254.57	309.64	363.58	408.28	459.39	-
500	20	508	59.32	68.65	78.56	117.15	155.12	117.15	117.15	183.43	247.84	155.13	155.13	311.19	381.55	441.52	508.15	564.85	-
550	22	559	65.33	75.62	86.55	129.14	171.09	-	129.14	-	294.27	-	171.10	373.85	451.45	527.05	600.67	672.30	-
600	24	610	82.58	94.53	94.53	141.12	209.64	141.12	141.12	255.43	355.28	187.07	187.07	442.11	547.74	640.07	720.19	808.27	-
650	26	660	-	-	127.36	202.74	-	-	152.88	-	-	-	202.74	-	-	-	-	-	-
700	28	711	-	-	137.32	218.71	271.21	-	164.86	-	-	-	218.71	-	-	-	-	-	-
750	30	762	118.34	147.29	147.29	234.68	292.18	-	176.85	-	-	-	234.68	-	-	-	-	-	-
800	32	813	-	-	157.25	250.65	312.15	-	188.83	342.94	-	-	250.65	-	-	-	-	-	-
850	34	864	-	-	167.21	266.63	332.12	-	200.82	364.92	-	-	266.63	-	-	-	-	-	-
900	36	914	-	-	176.97	282.29	351.70	-	212.57	420.45	-	-	282.29	-	-	-	-	-	-

Nominal Size		OD	Nominal Wall Thickness For Welded & Seamless Wrought Steel Pipe To ASME B36.10 (In Millimeters)																
			Nominal Wall Thickness For Welded & Seamless Wrought Stainless Steel Pipe To ASME B36.19 (In Millimeters)																
DN	NPS	mm	Schedule																
			5S	10S	10	20	30	40S	STD	40	60	80S	XS	80	100	120	140	160	XXS
6	1/8	10.3	-	1.24	1.24	-	1.45	1.73	1.73	1.73	-	2.41	2.41	2.41	-	-	-	-	-
8	1/4	13.7	-	1.65	1.65	-	1.85	2.24	2.24	2.24	-	3.02	3.02	3.02	-	-	-	-	-
10	3/8	17.1	-	1.65	1.65	-	1.85	2.31	2.31	2.31	-	3.20	3.20	3.20	-	-	-	-	-
15	1/2	21.3	1.65	2.11	2.11	-	2.41	2.77	2.77	2.77	-	3.73	3.73	3.73	-	-	-	4.78	7.47
20	3/4	26.7	1.65	2.11	2.11	-	2.41	2.87	2.87	2.87	-	3.91	3.91	3.91	-	-	-	5.56	7.82
25	1	33.4	1.65	2.77	2.77	-	2.90	3.38	3.38	3.38	-	4.55	4.55	4.55	-	-	-	6.35	9.09
32	1 1/4	42.2	1.65	2.77	2.77	-	2.97	3.56	3.56	3.56	-	4.85	4.85	4.85	-	-	-	6.35	9.70
40	1 1/2	48.3	1.65	2.77	2.77	-	3.18	3.68	3.68	3.68	-	5.08	5.08	5.08	-	-	-	7.14	10.15
50	2	60.3	1.65	2.77	2.77	-	3.18	3.91	3.91	3.91	-	5.54	5.54	5.54	-	-	-	8.74	11.07
65	2 1/2	73.0	2.11	3.05	3.05	-	4.78	5.16	5.16	5.16	-	7.01	7.01	7.01	-	-	-	9.53	14.02
80	3	88.9	2.11	3.05	3.05	-	4.78	5.49	5.49	5.49	-	7.62	7.62	7.62	-	-	-	11.13	15.24
90	3 1/2	101.6	2.11	3.05	3.05	-	4.78	5.74	5.74	5.74	-	8.08	8.08	8.08	-	-	-	-	-
100	4	114.3	2.11	3.05	3.05	-	4.78	6.02	6.02	6.02	-	8.56	8.56	8.56	-	11.13	-	13.49	17.12
125	5	141.3	2.77	3.40	3.40	-	-	6.55	6.55	6.55	-	9.53	9.53	9.53	-	12.70	-	15.88	19.05
150	6	168.3	2.77	3.40	3.40	-	-	7.11	7.11	7.11	-	10.97	10.97	10.97	-	14.27	-	18.26	21.95
200	8	219.1	2.77	3.76	3.76	6.35	7.04	8.18	8.18	8.18	10.31	12.70	12.70	12.70	15.09	18.26	20.62	23.01	22.23
250	10	273.1	3.40	4.19	4.19	6.35	7.80	9.27	9.27	9.27	12.70	12.70	12.70	15.09	18.26	21.44	25.40	28.58	25.40
300	12	323.9	3.96	4.57	4.57	6.35	8.38	9.53	9.53	10.31	14.27	12.70	12.70	17.48	21.44	25.40	28.58	33.32	25.40
350	14	355.6	3.96	4.78	6.35	7.92	9.53	9.53	9.53	11.13	15.09	12.70	12.70	19.05	23.83	27.79	31.75	35.71	-
400	16	406.4	4.19	4.78	6.35	7.92	9.53	9.53	9.53	12.70	16.66	12.70	12.70	21.44	26.19	30.96	36.53	40.49	-
450	18	457	4.19	4.78	6.35	7.92	11.13	9.53	9.53	14.27	19.05	12.70	12.70	23.83	29.36	34.93	39.67	45.24	-
500	20	508	4.78	5.54	6.35	9.53	12.70	9.53	9.53	15.09	20.62	12.70	12.70	26.19	32.54	38.10	44.45	50.01	-
550	22	559	4.78	5.54	6.35	9.53	12.70	-	9.53	-	22.23	-	12.70	28.58	34.93	41.28	47.63	53.98	-
600	24	610	5.54	6.35	6.35	9.53	14.27	9.53	9.53	17.48	24.61	12.70	12.70	30.96	38.89	46.02	52.37	59.54	-
650	26	660	-	-	7.92	12.70	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-
700	28	711	-	-	7.92	12.70	15.88	-	9.53	-	-	-	12.70	-	-	-	-	-	-
750	30	762	6.35	7.92	7.92	12.70	15.88	-	9.53	-	-	-	12.70	-	-	-	-	-	-
800	32	813	-	-	7.92	12.70	15.88	-	9.53	17.48	-	-	12.70	-	-	-	-	-	-
850	34	864	-	-	7.92	12.70	15.88	-	9.53	17.48	-	-	12.70	-	-	-	-	-	-
900	36	914	-	-	7.92	12.70	15.88	-	9.53	19.05	-	-	12.70	-	-	-	-	-	-



Long and Short Radius Elbows

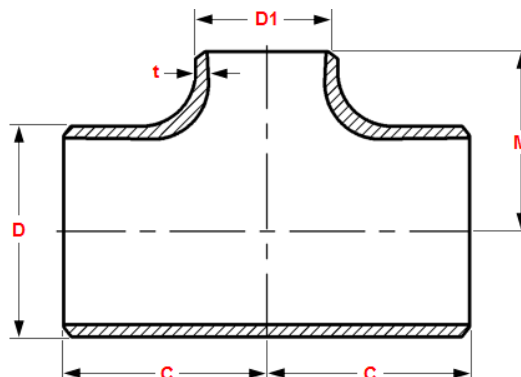
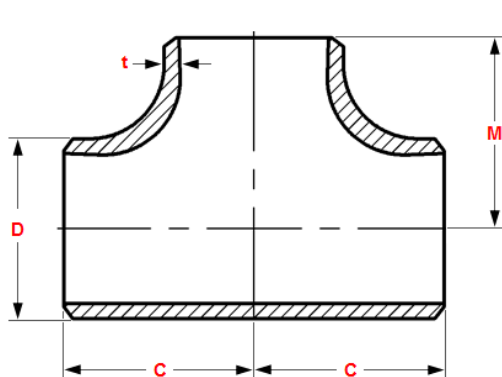
Nominal Pipe Size mm	Outside Diameter at Bevel D	Centre to End		
		Long Radius Elbow		Short Radius Elbow
		90 Deg A	45 Deg B	90 Deg A
15	21.3	38.1	15.7	—
20	26.7	28.4	11.2	—
25	33.5	38.1	22.4	25.4
32	42.2	47.8	25.4	31.8
40	48.3	57.2	28.4	38.1
50	60.3	76.2	35.1	50.8
65	73.0	95.2	44.4	63.5
80	88.9	114.3	50.8	76.2
100	114.3	152.4	63.5	101.6
125	141.3	190.5	79.2	127.0
150	168.3	228.6	95.2	152.4
200	219.1	304.8	127.0	203.2
250	273.1	381.0	158.8	254.0
300	323.8	457.2	190.5	304.8
350	355.6	533.4	222.2	355.6
400	406.4	609.6	254.0	406.4
450	457.2	685.8	285.8	457.2
500	508.0	762.0	317.5	508.0
600	609.6	914.4	381.0	609.6

Note: "t" = wall thickness and is designated by linepipe schedule

Return (180deg) Elbows

Nominal Pipe Size mm	Outside Diameter at Bevel D	Long Radius		Short Radius	
		Centre to Centre O	Back to Face K	Centre to Centre O	Back to Face K
15	21.3	76.2	47.8	—	—
20	26.7	57.2	42.9	—	—
25	33.5	76.2	55.6	50.8	41.1
32	42.2	95.2	69.8	63.5	52.3
40	48.3	114.3	82.6	76.2	62.0
50	60.3	152.4	106.4	101.6	81.0
65	73.0	190.5	131.8	127.0	100.1
80	88.9	228.6	158.8	152.4	120.7
100	114.3	304.8	209.6	203.2	158.8
125	141.3	381.0	261.9	254.0	196.9
150	168.3	457.2	312.7	304.8	236.5
200	219.1	609.6	414.3	406.4	312.7
250	273.1	762.0	517.7	508.0	390.7
300	323.8	914.4	619.3	609.6	466.9
350	355.6	1066.8	711.2	711.2	533.4
400	406.4	1219.2	812.8	812.8	609.6
450	457.2	1371.6	914.4	914.4	685.8
500	508.0	1524.0	1016.0	1016.0	762.0
600	609.6	1828.8	1219.2	1219.2	914.4

Note: "t" = wall thickness and is designated by linepipe schedule



Tees: Equal and Reducing

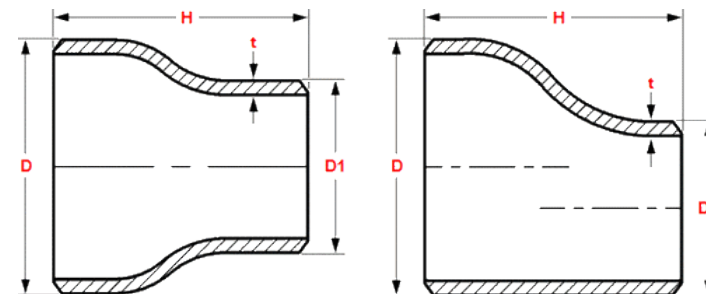
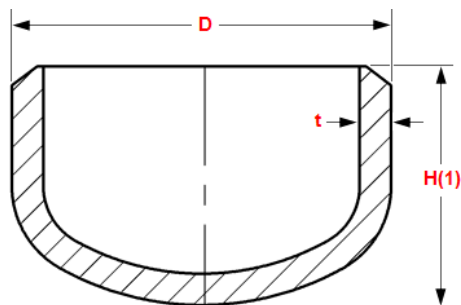
Nominal Pipe Size mm	Outside Diameter at Bevel D		Centre-to-end		Nominal Pipe Size mm	Outside Diameter at Bevel D		Centre-to-end	
	Run	Outlet	Run C	Outlet M		Run	Outlet	Run C	Outlet M
15x15	21.3	21.3	25.4	25.4	80x80		88.9		85.9
20x20	26.7	26.7	28.4	28.4	80x65	88.9	73.0	85.9	82.6
20x15		21.3		28.4	80x50		60.3		76.2
25x25	33.5	33.5	38.1	38.1	80x40		48.3		73.0
25x20		26.7		38.1	80x32		42.2		69.8
25x15		21.3		38.1	100x100		114.3		104.6
32x32	42.2	42.2	47.8	47.8	100x80	114.3	88.9	104.6	98.6
32x25		33.5		47.8	100x65		73.0		95.2
32x20		26.7		47.8	100x50		60.3		88.9
32x15		21.3		47.8	100x40		48.3		85.9
40x40	48.3	48.3	57.2	57.2	125x125	141.3	141.3	124.0	124.0
40x32		42.2		57.2	125x100		114.3		117.3
40x25		33.5		57.2	125x80		88.9		111.3
40x20		26.7		57.2	125x65		73.0		108.0
40x15		21.3		57.2	125x50		60.3		104.6
50x50	60.3	60.3	63.5	63.5	150x150	168.3	168.3	142.7	142.7
50x40		48.3		63.5	150x125		141.3		136.7
50x32		42.2		63.5	150x100		114.3		130.0
50x25		33.5		63.5	150x80		88.9		124.0
50x20		26.7		63.5	150x65		73.0		120.6
65x65	73.0	73.0	76.2	76.2	200x200	219.1	219.1	177.8	177.8
65x50		60.3		76.2	200x150		168.3		168.3
65x40		48.3		76.2	200x125		141.3		162.1
65x32		42.2		76.2	200x100		114.2		155.4
65x25		33.5		76.2					

Note: "t" = wall thickness and is designated by linepipe schedule

Tees: Equal and Reducing

Nominal Pipe Size mm	Outside Diameter at Bevel D		Centre-to-end		Nominal Pipe Size mm	Outside Diameter at Bevel D		Centre-to-end	
	Run	Outlet	Run C	Outlet M		Run	Outlet	Run C	Outlet M
250x250	273.1	273.1	215.9	215.9	450x450	457.2	457.2	342.9	342.9
250x200		219.1		203.2	450x400		406.4		330.2
250x150		168.3		193.5	450x350		355.6		330.2
250x125		141.3		190.5	450x300		323.8		320.5
250x100		114.3		184.2	450x250		273.1		307.8
300x300	323.8	323.8	254.0	254.0	450x200		219.1		298.4
300x250		273.1		241.3	500x500	508.0	508.0	381.0	381.0
300x200		219.1		228.6	500x450		457.2		368.3
300x150		168.3		219.1	500x400		406.4		355.6
300x125		141.3		215.9	500x350		355.6		355.6
350x350	355.6	355.6	279.4	279.4	500x300		323.8		345.9
350x300		323.8		269.7	500x250		273.1		333.2
350x250		273.1		257.0	500x200		219.1		323.8
350x200		219.1		247.6	600x600	609.6	609.6	431.8	431.8
350x150		168.3		238.3	600x500		508.0		431.8
400x400	406.4	406.4	304.8	304.8	600x450		457.2		419.1
400x350		355.6		304.8	600x400		406.4		406.4
400x300		323.8		295.1	600x350		355.6		406.4
400x250		273.1		282.4	600x300		323.8		396.7
400x200		219.1		273.0	600x250		273.1		384.0
400x150		168.3		263.7					

Note: "t" = wall thickness and is designated by linepipe schedule



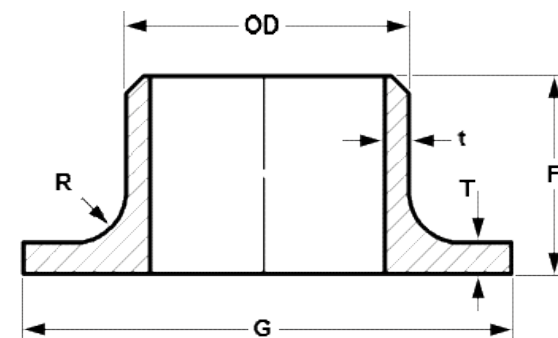
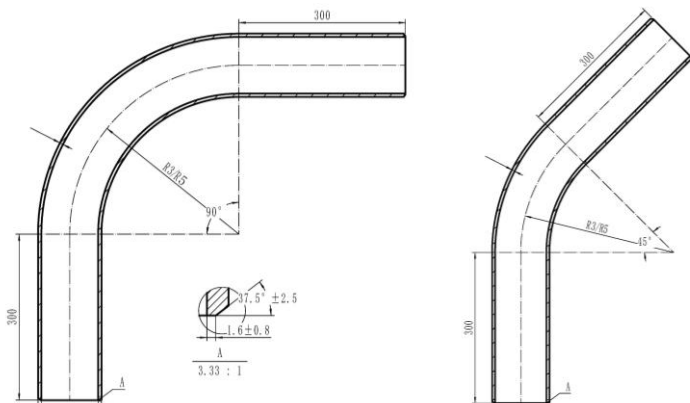
Caps			
Nominal Pipe Size mm	Outside Diameter at Bevel D	Length* H (1)	Limiting Wall Thickness for Length H (1)
15	21.3	25.4	4.6
20	26.7	25.4	3.8
25	33.5	38.1	4.6
32	42.2	38.1	4.8
40	48.3	38.1	5.1
50	60.3	38.1	5.6
65	73.0	38.1	7.1
80	88.9	50.8	7.6
100	114.3	63.5	8.6
125	141.3	76.2	9.7
150	168.3	88.9	10.9
200	219.1	101.6	12.7
250	273.1	127.0	12.7
300	323.8	152.4	12.7
350	355.6	165.1	12.7
400	406.4	177.8	12.7
450	457.2	203.2	12.7
500	508.0	228.6	12.7
600	609.6	266.7	12.7

Note: "t" = wall thickness and is designated by linepipe schedule

* Length applies for thickness not exceeding that given in column

Reducers Concentric and Eccentric											
NB Pipe Size	Outside Diameter at Bevel		End to End H	NB Pipe Size	Outside Diameter at Bevel		End to End H	NB Pipe Size	Outside Diameter at Bevel		End to End H
	Large End D	Small End D1			Large End D	Small End D1			Large End D	Small End D1	
20x15	26.7	21.3	38.1	100x80	114.3	88.9	101.6	350x300	355.6	323.8	330.2
25x20	33.5	26.7	50.8	100x65		73.0		350x250		273.1	
25x15		21.3		100x50		60.3		350x200		219.1	
				100x40		48.3		350x150		168.3	
32x25	42.2	33.5	50.8	125x100	141.3	114.3	127	400x350	406.4	355.6	355.6
32x20		26.7		125x80		88.9		400x300		323.8	
32x15		21.3		125x65		73.0		400x250		273.1	
				125x50		60.3		400x200		219.1	
40x32	48.3	42.2	63.5	150x125	168.3	141.3	139.7	450x400	457.2	406.4	381
40x25		33.5		150x100		114.3		450x350		355.6	
40x20		26.7		150x80		88.9		450x300		323.8	
40x15		21.3		150x65		73.0		450x250		273.1	
50x40	60.3	48.3	76.2	200x150	219.1	168.3	152.4	500x450	508	457.2	508
50x32		42.2		200x125		141.3		500x400		406.4	
50x25		33.5		200x100		114.3		500x350		355.6	
50x20		26.7		200x80		88.9		500x300		323.8	
65x50	73	60.3	88.9	250x200	273.1	219.1	177.8	600x500	609.6	508.0	508
65x40		48.3		250x150		168.3		600x450		457.2	
65x32		42.2		250x125		141.3		600x400		406.4	
65x25		33.5		250x100		114.3					
80x65	88.9	73.0	88.9	300x250	323.8	273.1	203.2				
80x50		60.3		300x200		219.1					
80x40		48.3		300x150		168.3					
80x32		42.2		300x125		141.3					

Note: "t" = wall thickness and is designated by linepipe schedule



Induction 3D & 5D Bend

Nominal Pipe Size	Outside Diameter at Bevel	3D Centre Line Radius		5D Centre Line Radius		Tangent *
		90 Deg R3 *	45 Deg R3 *	90 Deg R5 *	45 Deg R5 *	
15	21.3	38.1	38.1	63.5	63.5	300
20	26.7	57.2	57.2	95.3	95.3	300
25	33.5	76.2	76.2	127.0	127.0	300
32	42.2	95.3	95.3	158.8	158.8	300
40	48.3	114.3	114.3	190.5	190.5	300
50	60.3	152.4	152.4	254.0	254.0	300
65	73.0	190.5	190.5	317.5	317.5	300
80	88.9	228.6	228.6	381.0	381.0	300
100	114.3	304.8	304.8	508.0	508.0	300
125	141.3	381.0	381.0	635.0	635.0	300
150	168.3	457.2	457.2	762.0	762.0	300
200	219.1	609.6	609.6	1,016	1,016	300
250	273.1	762.0	762.0	1,270	1,270	300
300	323.8	914.4	914.4	1,524	1,524	300
350	355.6	1,067	1,067	1,778	1,778	300
400	406.4	1,219	1,219	2,032	2,032	300
450	457.2	1,372	1,372	2,286	2,286	300
500	508.0	1,524	1,524	2,540	2,540	300
600	609.6	1,829	1,829	3,048	3,048	300

Note: wall thickness is designated by nominal pipe wall thickness.

* SPFA standard dimensions; according to ASME B16.49 the BEND RADIUS (R3 & R5) and TANGENT are specified by the purchaser.

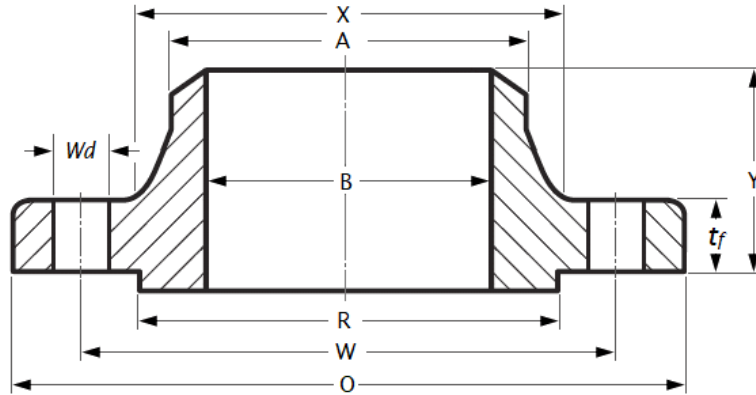
Stub Ends

Type A Radius for Lap Joint Type B Square for Slip On				& MSS Type A	MSS Type B	Long Pattern		Short Pattern		MSS SP43 Type A & B	
NB	OD <i>max</i>	OD <i>min</i>	G	R	R <i>max</i>	F	Approx kg	F	Approx kg	F	Approx kg
15	22.8	20.5	35	3	0.76	76	0.12	51	0.07	51	0.07
20	28.1	25.9	43	3	0.76	76	0.16	51	0.10	51	0.10
25	35.0	32.6	51	3	0.76	102	0.31	51	0.16	51	0.16
32	43.6	41.4	64	5	0.76	102	0.44	51	0.22	51	0.22
40	49.9	47.5	73	6	0.76	102	0.54	51	0.25	51	0.25
50	62.4	59.5	92	8	0.76	152	1.02	64	0.43	64	0.43
65	75.3	72.2	105	8	0.76	152	1.54	64	0.57	64	0.57
80	91.3	88.1	127	10	0.76	152	2.11	64	0.73	64	0.73
90	104.0	100.8	140	10	0.76	152	2.67	76	0.86	76	0.86
100	116.7	113.5	157	11	0.76	152	3.10	76	1.09	76	1.09
125	114.3	140.5	186	11	1.52	203	5.39	76	1.47	76	1.47
150	171.3	167.5	216	13	1.52	203	6.89	89	2.15	89	2.15
200	222.1	218.3	270	13	1.52	203	10.80	102	3.22	102	3.22
250	277.2	272.3	324	13	1.52	254	17.92	127	5.13	127	5.13
300	328.0	323.1	381	13	1.52	254	22.00	152	8.16	152	8.16
350	359.9	354.8	413	13	1.52	305	28.58	152	10.89	152	10.89
400	411.0	405.6	470	13	1.52	305	33.34	152	12.70	152	12.70
450	462.0	456.0	533	13	1.52	305	44.91	152	17.24	152	17.24
500	514.0	507.0	584	13	1.52	305	48.99	152	21.77	152	21.77
550	565.0	558.0	641	13	1.52	305	56.02	152	24.50	152	24.50
600	616.0	609.0	692	13	1.52	305	63.05	152	27.22	152	27.22

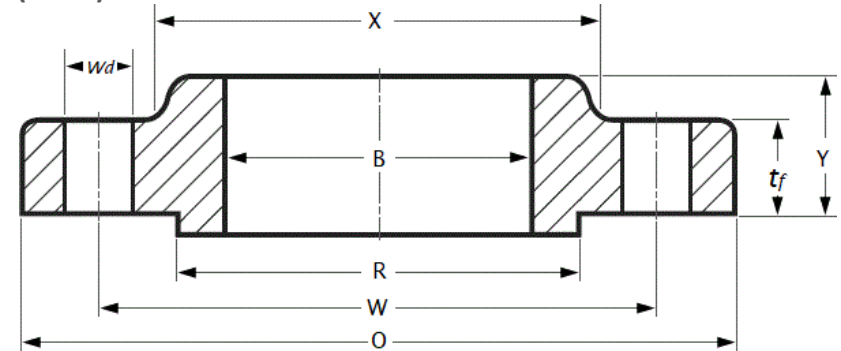
Note: the lap thickness "T" shall not be less than nominal pipe wall thickness "t"

Dimensional arrangements for ASME B16.5 Flanges

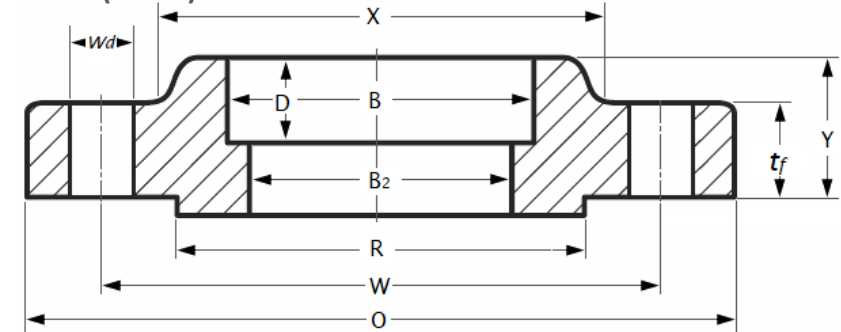
WELD NECK (WNRF)



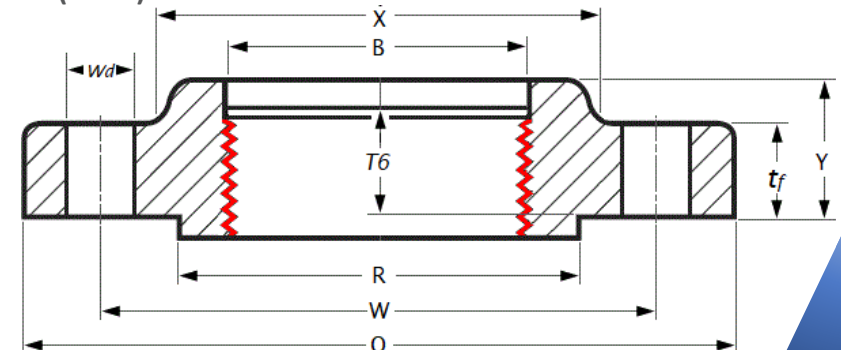
SLIP ON (SORF)



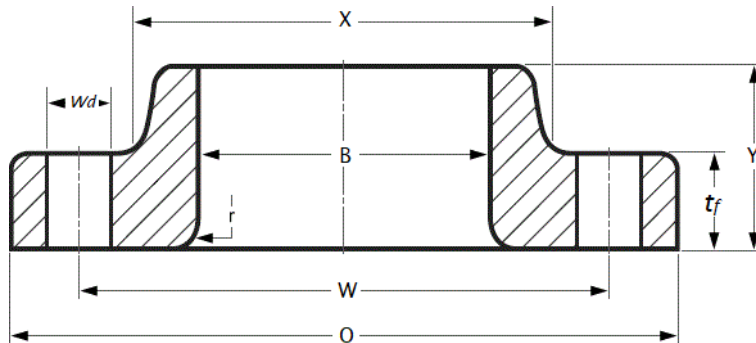
SOCKET WELD (SWRF)



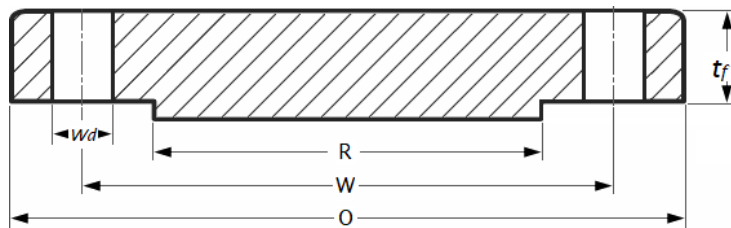
THREADED (THRF)



LAP JOINT (LJFF)



BLIND (BLRF)



Dimensional tables for ASME B16.5 Flanges

CLASS 150		15	20	25	32	40	50	65	80	90	100	125	150	200	250	300	350	400	450	500	600
OD	O	90	100	110	120	130	150	180	190	215	230	255	280	345	405	485	535	595	635	700	815
MIN THICK *	t_f	11.2	12.7	14.3	15.9	17.5	19.1	22.3	23.9	23.9	23.9	23.9	25.4	28.6	30.2	31.8	35.0	36.6	39.7	42.9	47.7
HUB LENGTH **	Y	16	16	17	21	22	25	29	30	32	33	36	40	44	49	56	57	64	68	73	83
HUB LENGTH W/N	Y	48	52	56	57	62	64	70	70	71	76	89	89	102	102	114	127	127	140	145	152
PCD	W	60.3	69.9	79.4	88.9	98.4	120.7	139.7	152.4	177.8	190.5	215.9	241.3	298.5	362.0	431.8	476.3	539.8	577.9	635.0	749.3
BOLT HOLE DIA	wd	16	16	16	16	16	19	19	19	19	19	22	22	22	25	25	29	29	32	32	35
No. BOLTS	n	4	4	4	4	4	4	4	4	4	8	8	8	8	12	12	12	16	16	20	20
WEIGHT ***	kg	0.5	0.7	0.9	1.1	1.4	2.2	3.2	3.6	5.0	5.9	6.8	8.0	12.8	18.0	27.7	37.7	48.2	59.0	67.0	96.0
WEIGHT W/N	kg	0.9	0.9	1.4	1.4	1.8	2.8	4.6	5.2	5.5	7.8	9.6	12.5	19.9	24.6	40.0	52.0	65.0	76.0	89.4	123.0
WEIGHT BLIND	kg	0.9	0.9	0.9	1.4	1.8	2.3	3.2	5.5	5.9	7.7	9.1	12.0	21.4	30.5	50.0	63.0	85.0	99.0	129.0	190.0
CLASS 300		15	20	25	32	40	50	65	80	90	100	125	150	200	250	300	350	400	450	500	600
OD	O	95	115	125	135	155	165	190	210	230	255	280	320	380	445	520	585	650	710	775	915
MIN THICK *	t_f	12.7	14.3	15.9	19.1	20.7	22.3	25.4	28.6	30.2	31.8	35.0	36.6	41.3	47.7	50.8	54.0	57.2	60.4	63.5	69.9
HUB LENGTH **	Y	22	25	25	27	30	33	38	43	44	48	51	52	62	67	73	76	83	89	95	106
HUB LENGTH W/N	Y	52	57	60	65	68	70	76	79	81	86	98	98	111	117	130	143	146	159	162	168
PCD	W	66.7	82.6	88.9	98.4	114.3	127.0	149.2	168.3	184.2	200.0	235.0	269.9	330.2	387.4	450.8	514.4	571.5	628.6	685.8	812.8
BOLT HOLE DIA	wd	16	19	19	19	22	19	22	22	22	22	22	22	25	29	32	32	35	35	35	41
No. BOLTS	n	4	4	4	4	4	8	8	8	4	8	8	12	12	16	16	20	20	24	24	24
WEIGHT ***	kg	0.7	1.1	1.4	2.1	3.0	3.2	4.6	5.9	7.3	10.5	13.2	16.3	25.0	35.0	51.0	72.0	95.0	115.0	140.0	223.0
WEIGHT W/N	kg	0.9	1.4	1.8	2.3	3.2	3.6	5.5	6.9	9.1	12.1	16.4	21.1	31.4	44.0	65.0	94.0	113.0	139.0	168.0	236.0
WEIGHT BLIND	kg	0.9	1.4	1.8	2.7	3.2	3.6	5.5	7.3	9.6	12.7	16.8	21.8	35.9	55.0	83.0	110.0	143.0	188.0	234.0	364.0
CLASS 600		15	20	25	32	40	50	65	80	90	100	125	150	200	250	300	350	400	450	500	600
OD	O	95	115	125	135	155	165	190	210	230	275	330	355	420	510	560	605	685	745	815	940
MIN THICK *	t_f	14.3	15.9	17.5	20.7	22.3	25.4	28.6	31.8	35.0	38.1	44.5	47.7	55.6	63.5	66.7	69.9	76.2	82.6	88.9	101.6
HUB LENGTH **	Y	22	25	27	29	32	37	41	46	49	54	60	67	76	86	92	94	106	117	127	140
HUB LENGTH W/N	Y	52	57	62	67	70	73	79	83	86	102	114	117	133	152	156	165	178	184	190	203
PCD	W	66.7	82.6	88.9	98.4	114.3	127.0	149.2	168.3	184.2	215.9	266.7	292.1	349.2	431.8	489.0	527.0	603.2	654.0	723.9	838.2
BOLT HOLE DIA	wd	16	19	19	19	22	20	22	22	25	25	29	29	32	35	35	38	41	45	45	51
No. BOLTS	n	4	4	4	4	4	8	8	8	8	8	12	12	12	16	20	20	20	20	24	24
WEIGHT ***	kg	0.9	1.4	1.6	2.1	3.2	3.6	5.5	6.8	9.6	15.0	28.6	36.4	44.1	80.0	98.0	118.0	166.0	216.0	278.0	398.0
WEIGHT W/N	kg	1.4	1.6	1.8	2.5	3.6	4.6	6.4	8.2	11.8	16.8	30.9	33.2	51.0	86.0	103.0	125.0	200.0	252.0	314.0	444.0
WEIGHT BLIND	kg	0.9	1.4	1.8	2.7	3.6	4.6	6.8	9.1	13.2	18.6	30.9	39.1	63.0	105.0	134.0	172.0	240.0	302.0	389.0	534.0

Note: * Min thickness includes raised face but not hub or WN

** Hub length for slip on and threaded flanges

*** Approximate weight SW, SO, LJ & THD (excludes WN) - ALL weights are approximate only

Dimensional tables for ASME B16.5 Flanges

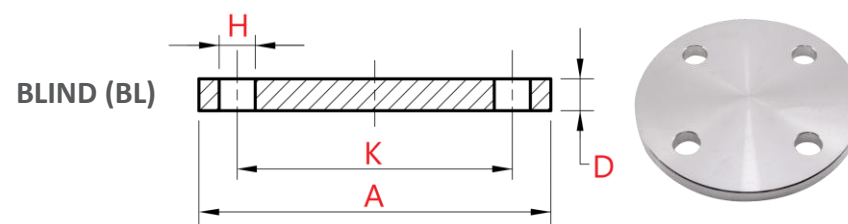
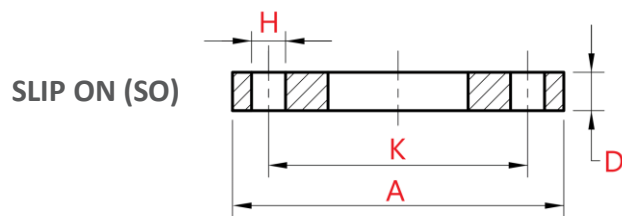
CLASS 900		15	20	25	32	40	50	65	80	90	100	125	150	200	250	300	350	400	450	500	600
OD	O	Use CLASS 1500 Dimensions							240	Size is not defined by ASME B16.5	290	350	380	470	545	610	640	705	785	855	1040
MIN THICK *	t_f								38.5		44.5	51.0	56.0	63.5	70.0	79.5	86.0	89.0	102.0	108.0	140.0
HUB LENGTH **	Y								54		70	79	86	102	108	117	130	133	152	159	203
HUB LENGTH W/N	Y								102		114	127	140	162	184	200	213	216	229	248	292
PCD	W								190.5		235.0	279.4	317.5	393.7	469.9	533.4	558.8	616.0	685.8	749.3	901.7
BOLT HOLE DIA	w_d								25		32	35	32	38	38	38	41	45	51	54	66
No. BOLTS	n								8		8	8	12	12	16	20	20	20	20	20	20
WEIGHT ***	kg								14.1		24.1	37.7	49.0	78.1	111.2	148.0	172.5	208.4	293.7	359.6	671.9
WEIGHT W/N	kg								13.2		23.2	39.0	49.9	84.9	121.7	168.9	255.2	311.0	419.5	528.5	956.6
WEIGHT BLIND	kg								14.0		24.6	39.6	51.0	90.0	132.0	188.0	225.0	281.0	400.0	503.0	954.0
CLASS 1500		15	20	25	32	40	50	65	80	90	100	125	150	200	250	300	350	400	450	500	600
OD	O	120	130	150	160	180	215	245	265	Size is not defined by ASME B16.5	310	375	395	485	585	675	750	825	915	985	1170
MIN THICK *	t_f	22.5	25.5	29.0	29.0	32.0	38.5	41.5	48.0		54.0	73.5	83.0	92.0	108.0	124.0	133.5	146.5	162.0	178.0	203.5
HUB LENGTH **	Y	32	35	41	41	44	57	64	-		-	-	-	-	-	-	-	-	-	-	-
HUB LENGTH W/N	Y	60	70	73	73	83	102	105	117		124	156	171	213	254	283	298	311	327	356	406
PCD	W	82.6	88.9	101.6	111.1	123.8	165.1	190.5	203.2		241.3	292.1	317.5	393.7	482.6	571.5	635.0	704.8	774.7	831.8	990.6
BOLT HOLE DIA	w_d	22	22	25	25	29	25	29	35		35	41	38	45	51	55	58	67	73	80	92
No. BOLTS	n	4	4	4	4	4	8	8	8		8	8	12	12	12	16	16	16	16	16	16
WEIGHT ***	kg	2.7	2.7	3.8	4.6	6.4	10.0	16.4	-		-	-	-	-	-	-	-	-	-	-	-
WEIGHT W/N	kg	2.3	3.2	3.9	4.6	6.4	10.9	16.4	21.8		31.4	60.0	75.0	124.0	206.0	314.0	380.0	775.0	644.0	775.0	1232
WEIGHT BLIND	kg	1.8	2.7	4.1	4.6	6.4	11.4	15.9	21.8		33.2	65.0	72.0	137.0	230.0	352.0	420.0	558.0	760.0	965.0	1558

Note: * Min thickness includes raised face but not hub or WN

** Hub length for slip on and threaded flanges

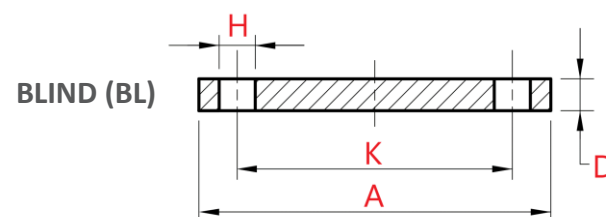
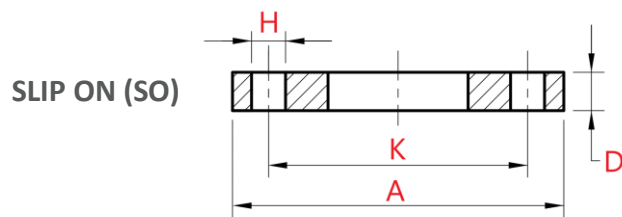
*** Approximate weight SW, SO, LJ & THD (excludes WN) - ALL weights are approximate only



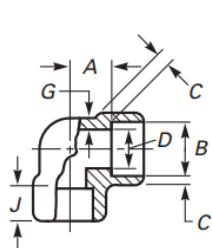


AS2129 TABLE D	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
THICKNESS * D	5	5	5	6	6	8	8	10	10	13	13	13	16	19	22	22	25	29	32
O D A	95	100	115	120	135	150	165	185	215	255	280	335	405	455	525	580	640	705	825
PCD K	67	73	83	87	98	114	127	146	178	210	235	292	356	406	470	521	584	641	756
No BOLTS n	4	4	4	4	4	4	4	4	4	8	8	8	8	12	12	12	12	16	16
BOLT SIZE H	M12	M12	M12	M12	M12	M16	M16	M16	M16	M16	M16	M16	M20	M20	M24	M24	M24	M24	M27
I WEIGHT SO kg	0.30	0.30	0.40	0.50	0.60	0.90	1.10	1.60	2.10	3.70	4.10	5.10	8.80	11.90	20.20	23.10	30.70	42.40	60.20
WEIGHT BL kg	0.28	0.31	0.41	0.54	0.68	1.12	1.36	2.14	2.89	5.28	6.36	9.11	16.39	24.56	37.86	46.21	63.94	90.00	136.00
AS2129 TABLE E	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
THICKNESS * D	6	6	7	8	9	10	10	11	13	14	17	19	22	25	29	32	35	38	48
O D A	95	100	115	120	135	150	165	185	215	255	280	335	405	455	525	580	640	705	825
PCD K	67	73	83	87	98	114	127	146	178	210	235	292	356	406	470	521	584	641	756
No BOLTS n	4	4	4	4	4	4	4	4	8	8	8	8	12	12	12	12	16	16	16
BOLT SIZE H	M12	M12	M12	M12	M12	M16	M16	M16	M16	M16	M20	M20	M20	M24	M24	M24	M24	M24	M30
WEIGHT SO kg	0.30	0.40	0.50	0.60	0.90	1.20	1.30	1.80	2.70	3.90	5.30	7.50	12.10	15.60	26.60	33.6	42.90	55.50	90.30
WEIGHT BL kg	0.34	0.37	0.58	0.72	1.02	1.40	1.70	2.35	3.75	5.68	8.32	13.31	22.53	32.32	49.91	67.22	89.50	117.93	204.00
AS2129 TABLE F	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
THICKNESS * D	10	10	10	13	13	16	16	16	19	22	22	25	29	32	35	41	44	51	57
O D A	95	100	120	135	140	165	185	205	230	280	305	370	430	490	550	610	675	735	850
PCD K	67	73	87	98	105	127	146	165	191	235	260	324	381	438	495	552	610	673	871
No BOLTS n	4	4	4	4	4	4	8	8	8	8	12	12	12	16	16	20	20	24	24
BOLT SIZE H	M12	M12	M16	M16	M16	M16	M16	M16	M16	M20	M20	M20	M24	M24	M27	M27	M30	M30	M33
WEIGHT SO kg	0.50	0.54	0.77	1.26	1.32	2.27	2.68	3.21	4.49	7.61	8.21	13.17	18.72	25.15	35.76	48.87	62.33	82.15	114.19
WEIGHT BL kg	0.53	0.59	0.84	1.41	1.53	2.66	3.25	4.05	6.14	10.53	12.32	21.05	32.93	47.12	64.76	93.24	122.59	168.38	253.10
AS2129 TABLE H	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
THICKNESS D	13	13	14	17	17	19	19	22	25	29	29	32	35	41	48	54	60	67	76
O D A	115	115	120	135	140	165	185	205	230	280	305	370	430	490	550	610	675	735	850
PCD K	83	83	87	98	105	127	146	165	191	235	260	324	381	438	495	552	610	673	781
No BOLTS n	4	4	4	4	4	4	8	8	8	8	12	12	12	16	16	20	20	24	24
BOLT SIZE H	M16	M16	M16	M16	M16	M16	M16	M16	M16	M20	M20	M20	M24	M24	M27	M27	M30	M30	M33
WEIGHT SO kg	1.00	1.00	1.20	1.70	1.80	2.80	3.40	4.70	6.20	10.60	11.80	17.60	23.70	34.10	52.10	68.70	90.80	115.90	162.90
WEIGHT BL kg	1.01	1.07	1.26	1.93	2.08	3.23	4.06	5.77	8.26	14.31	16.84	27.35	40.41	61.47	90.66	125.47	170.7	226.00	343.00

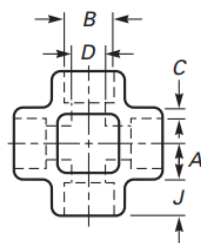
Note: * Plate flanges less than 12.0mm thickness may suffer unacceptable distortion after welding. these items are typically stocked in 10 or 12mm thickness



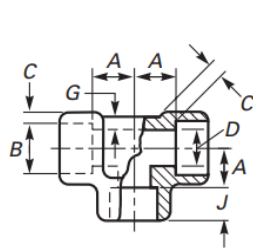
AS4087 PN16		15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
THICKNESS	D						11	11	11	13		13	19	19	23	30	30	30	38	48
O D	A						150	165	185	215		280	335	405	455	525	580	640	705	825
PCD	K						114	127	146	178		235	292	356	406	470	521	584	641	756
No BOLTS	n	-	-	-	-	-	4	4	4	4	-	8	8	8	12	12	12	12	16	16
BOLT SIZE	H						M16	M16	M16	M16		M16	M16	M20	M20	M24	M24	M24	M24	M27
WEIGHT SO	kg						1.23	1.44	1.75	2.63		3.90	7.39	10.23	13.93	26.68	30.78	36.27	54.41	88.40
WEIGHT BL	kg						1.50	1.83	2.33	3.75		6.33	13.38	19.54	29.72	51.54	63.25	77.35	118.66	205.37
AS4087 PN21		15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
THICKNESS	D						15	15	15	19		24	24	30	30	30	38	38	48	58
O D	A						165	185	205	230		305	370	430	490	550	610	675	735	850
PCD	K						127	146	165	191		260	324	381	438	495	552	610	673	781
No BOLTS	n	-	-	-	-	-	4	8	8	8	-	12	12	12	16	16	20	20	24	24
BOLT SIZE	H						M16	M16	M16	M16		M20	M20	M24	M24	M27	M27	M30	M30	M33
WEIGHT SO	kg						2.13	2.51	3.01	4.49		8.95	12.64	19.36	23.57	30.65	45.29	53.83	77.32	116.19
WEIGHT BL	kg						2.50	3.05	3.80	6.14		13.44	20.21	34.06	44.18	55.51	86.42	105.88	158.48	257.54
EN1092 PN16		15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
THICKNESS	D	14	16	16	18	18	20	20	20	22	22	24	26	29	32	35	38	42	46	55
O D	A	95	105	115	140	150	165	185	200	220	250	285	340	405	460	520	580	640	715	840
PCD	K	65	75	85	100	110	125	145	160	180	210	240	295	355	410	470	525	585	650	770
No BOLTS	n	4	4	4	4	4	4	8	8	8	8	8	12	12	12	16	16	20	20	20
BOLT SIZE	H	M12	M12	M12	M16	M16	M16	M16	M16	M16	M16	M20	M20	M24	M24	M24	M27	M27	M30	M33
WEIGHT SO	kg	0.69	0.97	1.16	1.90	2.17	2.84	3.35	3.75	4.57	4.57	7.43	10.14	14.83	19.84	29.35	37.46	48.10	66.82	106.05
WEIGHT BL	kg	0.74	1.05	1.28	2.12	2.45	3.33	4.06	4.80	6.47	6.47	11.92	18.33	29.04	41.82	58.35	78.58	105.63	144.59	240.08
EN1092 PN25		15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
THICKNESS	D	14	16	16	18	18	20	22	24	26	28	30	32	35	38	42	48	54	58	68
O D	A	95	105	115	140	150	165	185	200	235	270	300	360	425	485	555	620	670	730	845
PCD	K	65	75	85	100	110	125	145	160	190	220	250	310	370	430	490	550	600	660	770
No BOLTS	n	4	4	4	4	4	4	8	8	8	8	8	12	12	16	16	16	20	20	20
BOLT SIZE	H	M12	M12	M12	M16	M16	M16	M16	M16	M20	M24	M24	M24	M27	M27	M30	M33	M33	M33	M36
WEIGHT SO	kg	0.69	0.97	1.16	1.90	2.17	2.84	3.68	4.50	6.32	8.42	10.68	14.88	21.03	27.80	43.58	60.16	72.73	90.78	132.82
WEIGHT BL	kg	0.74	1.05	1.28	2.12	2.45	3.33	4.47	5.77	8.57	12.14	16.30	24.97	38.17	53.89	78.38	112.11	146.69	188.84	298.54



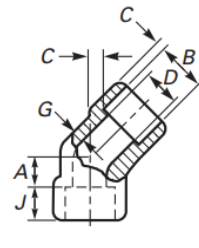
90-deg Elbow



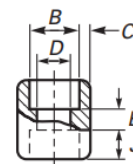
Cross



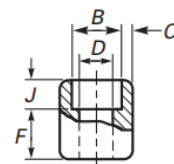
Tee



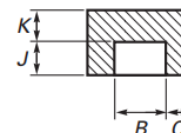
45-deg Elbow



Coupling



Half-Coupling



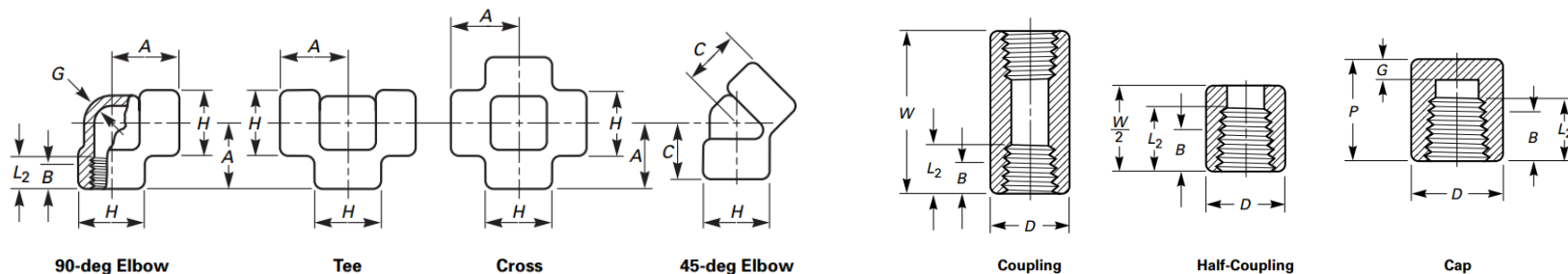
Cap

Class 3000		Centre-to-bottom of Socket	Centre-to-bottom of Socket	Socket Bore		Socket Wall		Bore Diameter		Laying Length	Laying Length	Body Wall	End Wall	Tolerances +/- mm		
Note:		1	2			3										
DN	NPS	A	A	B Max Min		C Avg Min		D Max Min		E	F	G	K	A	E	F
6	1/8	11.0	8.0	11.2	10.8	3.18	3.18	7.6	6.1	6.5	16.0	2.41	4.8	1.0	1.5	1.0
8	1/4	11.0	8.0	14.6	14.2	3.78	3.30	10.0	8.5	6.5	16.0	3.02	4.8	1.0	1.5	1.0
10	3/8	13.5	8.0	18.0	17.6	4.01	3.50	13.3	11.8	6.5	17.5	3.20	4.8	1.5	3.0	1.5
15	1/2	15.5	11.0	22.2	21.8	4.67	4.09	16.6	15.0	9.5	22.5	3.73	6.4	1.5	3.0	1.5
20	3/4	19.0	13.0	27.6	27.2	4.90	4.27	21.7	20.2	9.5	24.0	3.91	6.4	1.5	3.0	1.5
25	1	22.5	14.0	34.3	33.9	5.69	4.98	27.4	25.9	12.5	28.5	4.55	9.6	2.0	4.0	2.0
32	1-1/4	27.0	17.5	43.1	42.7	6.07	5.28	35.8	34.3	12.5	30.0	4.85	9.6	2.0	4.0	2.0
40	1-1/2	32.0	20.5	49.2	48.8	6.35	5.54	41.6	40.1	12.5	32.0	5.08	11.2	2.0	4.0	2.0
50	2	38.0	25.5	61.7	61.2	6.96	6.04	53.3	51.7	19.0	41.0	5.54	12.7	2.0	4.0	2.0
65	2-1/2	41.0	28.5	74.4	73.9	8.76	7.67	64.2	61.2	19.0	43.0	7.01	15.7	2.5	5.0	2.5
80	3	57.0	32.0	90.3	89.8	9.52	8.30	79.4	76.4	19.0	44.5	7.62	19.0	2.5	5.0	2.5
100	4	66.5	41.0	115.7	115.2	10.69	9.35	103.8	100.7	19.0	48.0	8.56	22.4	2.5	5.0	2.5

Note: 1 For 90deg Elbows, Tees and Crosses

2 For 45deg Elbows

3 Average socket wall thickness around periphery shall not be less than the listed value. The minimum value are permitted in localized areas.



Class 3000		Centre-to-end	Centre-to-end	Minimum Length of Thread		OD of Band	Min Wall	Min End Wall	End-to-end Couplings	End-to-end Caps	OD
Note:		1	2	3			4	5			
DN	NPS	A	C	B	L2	H	G (1)	G (2)	W	P	D
6	1/8	21	17	6.4	6.7	22	3.18	4.8	32	19	16
8	1/4	25	19	8.1	10.2	25	3.30	4.8	35	25	19
10	3/8	28	22	9.1	10.4	33	3.51	4.8	38	25	22
15	1/2	33	25	10.9	13.6	38	4.09	6.4	48	32	28
20	3/4	38	28	12.7	13.9	46	4.32	6.4	51	37	35
25	1	44	33	14.7	17.3	56	4.98	9.7	60	41	44
32	1-1/4	51	35	17.0	18.0	62	5.28	9.7	67	44	57
40	1-1/2	60	43	17.8	18.4	75	5.56	11.2	79	44	64
50	2	64	44	19.0	19.2	84	7.14	12.7	86	48	76
65	2-1/2	83	52	23.6	28.9	102	7.65	15.7	92	60	92
80	3	95	64	25.9	30.5	121	8.84	19.0	108	65	108
100	4	114	79	27.7	33.0	152	11.18	22.4	121	68	140

Note: 1 For 90deg Elbows, Tees and Crosses

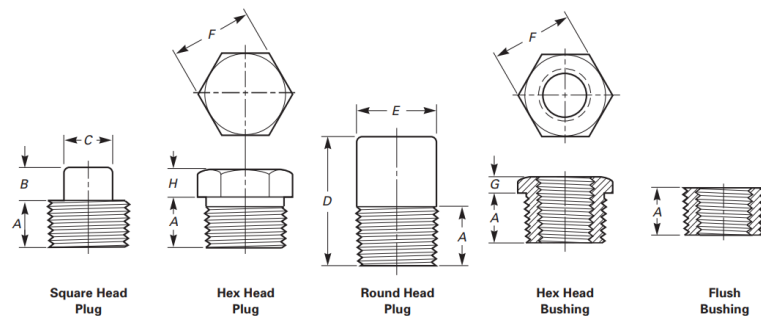
2 For 45deg Elbows

3 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).

4 For 90deg, 45deg Elbows, Tees and Crosses

5 For Couplings, Half Couplings and Caps. The wall thickness away from the threaded ends shall meet the minimum wall thickness requirements of G(1).





Class 3000		Min Length	Min Square Height	Min Width Flats	Min Length	Nominal Head Dia	Nominal Width Flats	Min Hex Height Bush	Min Hex Height Plug
Note:				2			2		
DN	NPS	A	B	C	D	E	F	G	H
6	1/8	10	6	7.15	35	10	11.11	-	6
8	1/4	11	6	9.55	41	14	15.88	3	6
10	3/8	13	8	11.11	41	18	17.46	4	8
15	1/2	14	10	14.29	44	21	22.23	5	8
20	3/4	16	11	15.88	44	27	26.99	6	10
25	1	19	13	20.64	51	33	34.93	6	10
32	1-1/4	21	14	23.81	51	43	44.45	7	14
40	1-1/2	21	16	28.58	51	48	50.80	8	16
50	2	22	18	53.34	64	60	63.50	9	18
65	2-1/2	27	19	38.10	70	73	76.20	10	19
80	3	28	21	42.86	70	89	88.90	10	21
100	4	32	25	63.50	76	114	117.48	13	25

Note: 1

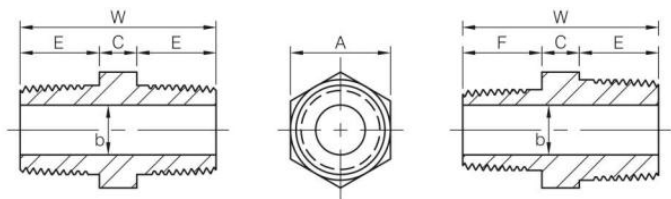
ASME B16.11 Cautionary Note Regarding Hex Bushings: Hex head bushings of one-size reduction should not be used in services where they might be subject to harmful loads and forces other than internal pressures.

2

Manufacturer's applied tolerance shall ensure dimension will fit U.S. Customary tooling.



Hex / Reducing Nipples to BS3799

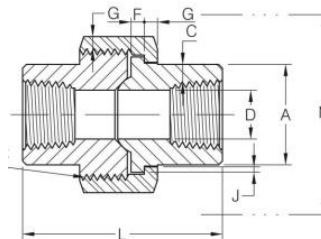


FULL SIZE

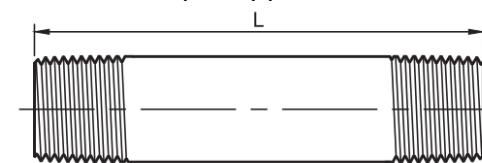
REDUCING SIZE

Class 3000		HEX NIPPLE Across Flat	HEX NIPPLE Length	HEX NIPPLE Hex Length	HEX NIPPLE End Length	RED NIPPLE Reducing End	UNION Length	UNION Clearance
Note:		Min	Min	Min	Min	Min	Min	
DN	NPS	A	W	C	E	F	L	N
6	1/8	11	26	6	10	-	41.4	50.8
8	1/4	15	36	6	15	-	41.4	50.8
8 x 6	1/4 x 1/8		31	6		10		
10	3/8	18	40	8	16	-	46.0	55.9
10 x 8	3/8 x 1/4		39	8		15		
15	1/2		48	8		-		
15 x 10	1/2 x 3/8	22	44	8	20	16	49.0	58.4
15 x 8	1/2 x 1/4		43	8		15		
20	3/4		52	10		-		
20 x 15	3/4 x 1/2	27	50	9	21	20	56.9	66.0
20 x 10	3/4 x 3/8		46	9		16		
25	1		60	10		-		
25 x 15	1 x 1/2	35	56	10	25	21	62.0	78.7
25 x 20	1 x 3/4		55	10		20		
32	1.1/4						71.1	94.0
40	1.1/2		68	16		-		
40 x 25	1.1/2 x 1	50	67	16	26	25	76.5	111.8
40 x 20	1.1/2 x 3/4		63	16		21		
40 x 15	1.1/2 x 1/2		62	16		20		
50	2		71	17		-		
50 x 40	2 x 1.1/2		70	17		26		
50 x 25	2 x 1	62	70	18	27	25	86.1	132.1
50 x 20	2 x 3/4		65	17		21		
50 x 15	2 x 1/2		65	18		20		

Unions to MSS SP-83



Pipe Nipples to



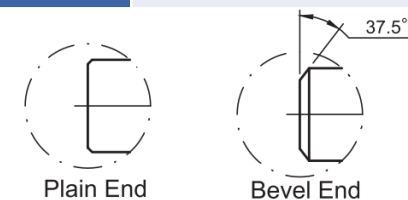
Pipe Nipples		Stock Range	Stock Range	Made to Order	Made to Order
		FROM	UP TO	FROM	UP TO
Size Range	NPS:	15	50	65	≈150
Carbon	Schedule:	STD	XS	100	XXS
Stainless	Schedule:	10S	80S	160	XXS

Standard Lengths:

All Grades / All Sizes:	75	50	Other lengths made to order
	100	150	

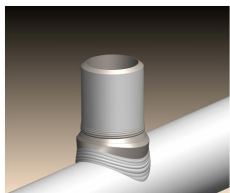
Standard Configurations:

PBE	Plain Both Ends
BBE	Bevelled Both Ends (made to order)
TOE	Threaded One End (and Plain the other)
TBE	Threaded Both Ends



Plain End

Bevel End

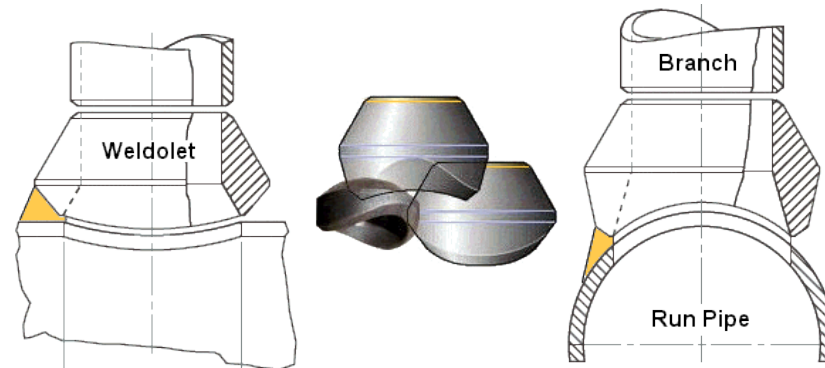


Ordering Nomenclature for Reinforced Branch Outlets

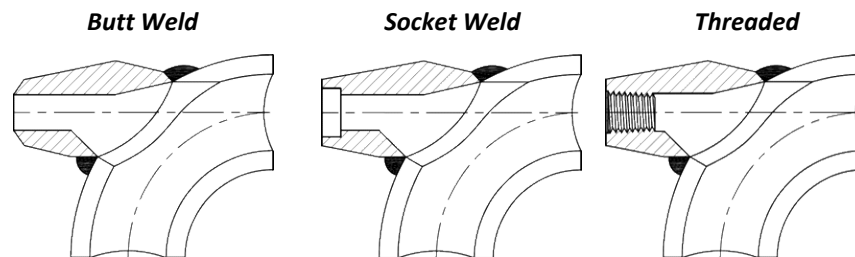
Size-1	End-1	Size-2	End-2	Type	Connection	Material
Branch	Pipe Schedule	Run	Pipe Schedule	Weldolet	Butt Weld	Grade
Branch	Pressure Class	Run	Pipe Schedule	Sockolet	Socket Weld	Grade
Branch	Pressure Class	Run	Pipe Schedule	Threadolet	Thread Type	Grade
Branch	Pipe Schedule	Run	Pipe Schedule	Elbowlet	Butt Weld	Grade
Branch	Pressure Class	Run	Pipe Schedule		Socket Weld	Grade
Branch	Pressure Class	Run	Pipe Schedule		Thread Type	Grade
Branch	Pipe Schedule	Run	Pipe Schedule	Latrolet	Butt Weld	Grade
Branch	Pressure Class	Run	Pipe Schedule		Socket Weld	Grade
Branch	Pressure Class	Run	Pipe Schedule		Thread Type	Grade
Branch	Pipe Schedule & Flange Class	Run	Pipe Schedule	Nipoflange	Butt Weld	Grade

Example:	Complete Order Description:
1" 80S Weldolet to Suit 10" Stainless Pipe	25NB Sch80S x 250NB Sch10S Weldolet BW 316/316L
2" NPT Elbowlet to suit 30" Carbon Pipe	50NB 3000# x 750NB SchSTD Elbowlet NPT A105N
¾" XS Nipoflange to suite 36" CrMo Pipe	20NB SchXS ANSI 300# x 900NB SchSTD Nipoflange BW A182-F22

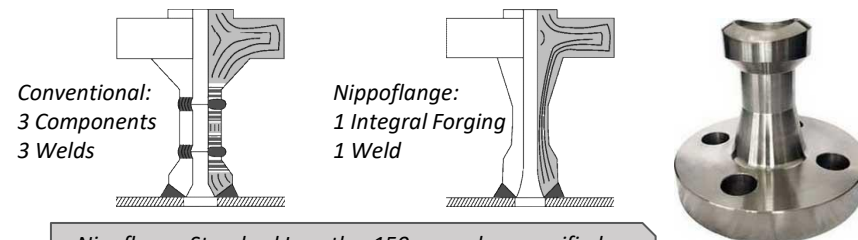
All Olets vary slightly in design between manufacturers and size combinations.
Basic dimensions comply with MSS SP-97.
Ask SPFA if specific design or manufacturer details are needed.
Design calculations may be necessary for unique configurations.



Elbowlets and Latrolets should be clearly specified with end connection type;



The Nipoflange's one piece integral construction is significantly advantageous over conventional three piece Flange/Nipple/Olet:



Nipoflange Standard Length = 150mm unless specified
Flange Dimensions to ASME B16.5

Materials

Stainless Steel

Austenitic: 304/L/H, 316/L/H, 316Ti, 310/H/S, 317/L, 321/H, 347/H, 904L (N08904), 6Mo (S31254)

Ferritic: 430, 446-2

Martensitic: 410

Duplex/Super Duplex

S31803, S32205, S32750, S32760

Nickel Alloy

Alloy 31, 59, 20, 200, 201, C-276, 400, 600, 601, 690, 693, 625, 718, 825, 800H/HT

Copper Nickel

90/10, EEMUA 7060X, 70/30

Carbon/High Yield

A, B, C, X42, X46, X52, X56, X60, X65, X70, X80, X90, X100, X120 Galvanised

Low Temp

1, 3, 6, CC60, CC65, CC70

Chrome Moly

P1, P2, P5/b/c, P9, P11, P12, P15, P21, P22, P23, P24, P36, P91, P92, P122, P911

Titanium

Commercially Pure (Grade 1, 2, 3, 4), Ti6Al-4V (Grade 5), Ti 6Al-4V ELI (Grade 23), Ti-Pd (Grade 7), Ti Code 12 (Grade 12)



Products

Pipe and Tube

Welded, Seamless, Heat Exchanger, Boiler, Super Heater, Finned

Buttweld Fittings

Elbows LR & SR
Induction Bend, Lobster Back
180, 90, 45 & Custom Angles
Tees, Reducers, Stub Ends
Caps, Crosses
45D Wye Pieces & 45D Tees

Flanges

Weld Neck, Slip On, Blind, Lap Joint, Socket Weld, Long Weld Neck, Spectacle, Orifice, Spade & Spacer
150# to 2500#, Table D to Table R, PN6 to PN40

Groove Pipe and Fittings

Roll Groove & Cut Groove Pipes
Couplings, Fittings, Flange Adaptors & Valves.

Pressure Fittings

Elbows, Tees, Couplings, Unions
Nipples, Bushes, Inserts
Weldolets, Sockolets
Threadolets, Nipolets, Latrolets
Elbolets, Sweepolets
Nipoflanges, BSPT, NPT, Socket Weld 3000#, 6000#, 9000#

Long Products

Plate, Sheet & Coil
Bars Round / Flat / Hex / Angle
Hollow Section, Channel

Custom Fittings

Transition Pieces,
Expansion Joints
Barred Tees, Nozzles

Ancillary

Stud Bolts, Gaskets, Flange Covers, Hangers, Clamps

Press-Fit Pipe

Connection Systems

Elbows, Tees, End Caps and Adaptors

Services

24 Hour, 7 days per week availability

Contract Management
Document Control

Tagging & Colour Coding
Packing & Marking
Freight, Storage & Warehousing

Technical Support
Third Party Inspection
Mechanical & NDE Testing



Specialised Pipe and Fittings Australia Pty Ltd is the premier supplier of quality pipe, pipe fittings, flanges and ancillary products.

We have the stock range and sourcing expertise to service the oil & gas, mining, mineral processing, petrochemical, power, defence, water and marine industries throughout Australia and Internationally.

Stainless Steel & Duplex

Pipe - Seamless

TP304/L & TP316/L 15-300NB
S31803/S32205 25-300NB
Schedule 10S/40S/80S/160/XXS

Buttweld Fittings -

Seamless

WP304/L & WP316/L 15-300NB
S31803/S32205 25-300NB
Schedule 10S/40S/80S/160/XXS
Elbows L/R 45D & 90D
Elbows S/R 90D
Tees Equal & reducing
Reducers Concentric & Eccentric
Caps & Stub Ends

ANSI Flanges

F304/L & F316/L 15-300NB
F51/F60 25-300NB
ASME B16.5 Class 150#, 300#,
600#, 900# & 1500#
Weld Neck & Slip On
Socket Weld & Blind
Threaded BSPT & NPT
Orifice, Lap Joint, Spectacle
Blinds, Spades & Spacers

Table Flanges

F304/L & F316/L 15-400NB
AS2129 Table D, E & PN 16
Slip On Pipe Bore & Blind
Threaded BSPT & NPT

Forged Pressure Fittings

F304/L & F316/L 15-300NB
3000# & 6000# Ratings
Socket Weld
Threaded BSPT & NPT
Elbows 45D & 90D
Tees Equal & reducing
Couplings Full, Half & Reducing
Reducing Bushes,
Reducing Inserts
Hex Nipples Equal & Reducing
Unions, Hex Plugs & Caps
Pipe Nipples PBE, TOE & TBE
Swage Nipples Concentric &
Eccentric

Branch Outlets

F304/L & F316/L 15-50NB
3000# & 6000# Ratings
Socklets, Weldolet
Thredolet BSPT & NPT
Elbolet, Latrolet
Nipolet, Nipoflange



Carbon Steel & Galvanised

Pipe - Seamless

A106-B / A53-B / API 5L-B / X42
PSL 1
15-600NB
Schedule STD / XS / 40 / 80 / 100
/ 120 / 140 / 160 / XXS

Pipe - Welded

A53-B / API 5L-B / X42 PSL 1
AS/NZS 1163 C350 LO
50-1200NB
Schedule STD / XS / 40 / 80

Buttweld Fittings

WPB Seamless 15-600NB
WPB WX 750-900NB
Schedule STD / XS / 40 / 80 / 100
/ 120 / 140 / 160 / XXS
Elbows L/R 45D & 90D
Elbows S/R 90D
Tees Equal & reducing
Reducers Concentric & Eccentric
Caps

3D Bends

A234-WPB Seamless 50-300NB
Schedule STD & XS
45D & 90D with 300mm
Tangents

Groove Pipe and Fittings

Roll Groove Pipes, Couplings,
Fittings, Flange Adaptors &
Valves.

ANSI Flanges

A105N 15-600NB
ASME B16.5 Class 150#, 300#,
600#, 900# & 1500#
Weld Neck & Slip On
Socket Weld & Blind
Threaded BSPT & NPT
Orifice, Lap Joint, Spectacle
Blinds, Spades & Spacers
ASME B16.47 Class 150# Series A
BS3293 Class 150# 750-900NB

Table Flanges

A105N 15-1200NB
AS2129 Table D, E & PN 16
Slip On Pipe Bore & Blind
Threaded BSPT & NPT

Forged Pressure Fittings

A105N 15-100NB
3000# & 6000# Ratings
Socket Weld
Threaded BSPT & NPT
Elbows 45D & 90D
Tees Equal & reducing
Couplings Full, Half & Reducing
Reducing Bushes
Reducing Inserts
Hex Nipples Equal & Reducing
Unions, Hex Plugs & Caps
Pipe Nipples PBE, TOE & TBE
Swage Nipples Conc & Ecc

Branch Outlets

A105N 15-150NB
3000# & 6000# Ratings
Socklets, Weldolet
Thredolet BSPT & NPT
Elbolet, Latrolet
Nipolet, Nipoflange

Galvanised Pipe

A106-B Pipe Seamless
Ends: Plain, BSPT & NPT
15-20NB Schedule XS
25-50NB Schedule STD & XS

Galvanised Pressure Fittings

A105N 15-50NB
3000# Rating
Threaded BSPT & NPT
Elbows 45D & 90D
Tees Equal
Couplings Full & Reducing
Reducing Bushes





PIPE

FITTINGS

FLANGES



Perth Melbourne Sydney Brisbane

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IN THE PIPING INDUSTRY**