



GRF ALLOYS INDUSTRIES

AN ISO 9001 : 2015 CERTIFIED COMPANY



“We Almost Deliver Everything in **STEEL**”





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Quality Policy



To strive for customer satisfaction by service and technological Integration.

All departments are fully atomized for better supply chain management to offer best product quality & prompt service to customers.

To Train, Motivate and Encourage Employees in achieving Company's Goals.

All our products passes through best of quality systems for material control, process control, testing, finishing and marking.

Create a sense of responsibility amongst all members of the organization

To maintain a competent work force through training and continual improvement of Quality Management Skills.

Continually improve our Quality Management System to ensure its continuing suitability to enable us to stay ahead of competition.

Third Party Inspection

GRF ALLOYS INDUSTRIES can offer you material with inspection of anythird party. Third party Inspection offers quality and thorough Inspection for buyers.

The Inspection Agency can be nominated by client or we can arrange the third party inspection by various world class reputed agency like below....





Company Profile

GRF ALLOYS INDUSTRIES is a formidable player and one of the leading manufactures, exporters & stockists of all kinds of Stainless Steel, Carbon Steel & Alloy Steel products. We have set up our business empire since last three decades serving many core industries all through out most satisfactorily.

We always strive to meet the exacting standards of quality for our products, which are as per accepted International standards. We supply better quality and better value for money to our customers using best quality control, state of the art machines, technology, trained manpower coupled with cost effectiveness that will sustain our future growth.

Today we are one of the leading manufacturers, exporters and stockists of stainless steel, carbon steel, alloy steel in the shape of entire range of forged flanges, entire range of Butt weld and socket weld pipe fittings supplying to various core industries like

- Refineries & Petrochemicals
- Oil & Gas
- Chemicals & Fertilisers Cement
- Engineering
- Construction
- Sugar
- Nuclear & Thermal
- Paper & Pulp

We are also certified and approved by many third party inspection agencies.

Exports

Having established our presence in the Indian market, we are now aggressively venturing into exporting of our products to various countries. We are already exporting our products to Europe, Middle East, Far East and African countries .

ISO 9001-2008 : In recognition of our efforts in quality control we have been awarded the coveted ISO 9001-2008 : quality certification from reputed agency.

Product Range



BUTT-WELD FITTINGS :-

- Stainless Steel** : ASTM A403 WP 304/ 304L/ 304H/ 316/ 316L/ 317/ 317L/ 321/ 310/ 347/ 904L etc.
- Carbon Steel** : ASTM A234 WPB / A420 WPL3/ A420 WPL6/ MSS-SP-75 WPHY 42/46/52/ 56/60/65/70
- Alloy Steel** : ASTM A234 WP1/ WP5/ WP9/ WP11/ WP22/WP91 etc.
- Others** : Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead, etc.
- Types** : Elbow, Tee, Reducer, Return Bends, Stub Ends, Cap, Collar, Cross, Insert etc.
- Size** : 1/4" NB TO 32" NB. (Seamless & Welded)
- Wall Thickness** : Sch. 5S To Sch. XXS.



FLANGES :-

- Stainless Steel** : ASTM A182 F304/304L/ 304H/ 316/ 316L/ 317/ 317L/ 321/ 310/ 347/ 904L etc.
- Carbon Steel** : ASTM A105/A694/F42/46/ 52/ 56/ 60/ 65/ 70/A350 LF3/A350 LF2, etc.
- Alloy Steel** : ASTM A182 F1/ F5/ F9/ F11/ F22/F91 etc.
- Others** : Monel, Nickel, Inconel, Hastalloy, Titanium, etc.
- Types** : Weldneck, Slipon, Blind, Socket Weld, Lap Joint, Spectacles, Ring Joint, Oriface, Long Weldneck, Deck Flange, etc.
- Size** : 1/2" NB TO 24" NB.
- Class** : 150#, 300#, 400#, 600#, 900#, 1500# & 2500#.
- DIN - STD** : PN6, PN10, PN16, PN25, PN40, PN100



SCREWED & FORGED FITTINGS

- Stainless Steel** : ASTM A182 F304/ 304L/ 304H/ 316/ 316 317/ 317L/ 321/310/ 347/ 904L etc.
- Carbon Steel** : ASTM A105 / A694 F42/46/ 52/56/ 60/ 65/ 70 / A350 LF3/ A350 LF2.
- Alloy Steel** : ASTM A182 F1/ F5/ F9/ F11/ F22/F91 etc.
- Others** : Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead, etc.
- Types** : Elbow, Tee, Union, Cross, CoupBushing, Plug, Swage Nipple, Welding Boss, Hexagon Nipple, Barrel Nipple, Welding Nipple, Parraler Nipple, Street Elbow, Hexagon Nut, Hose Nipple, Bend, Adapter, Insert, Weldolet, Elbowlet, Sockolet, Thredolet, Nipolet, Letrolet, etc.
- Size** : 1/4" NB TO 4" NB. (Socketweld & Threaded)
- Class** : 3000#, 6000#, 9000#.



Product Range

SPECIAL PRODUCTS



Spectacle Flanges

- Stainless Steel** : ASTM A182 F304/304L/ 304H/ 316/ 316L/ 317/317L/321/310/347/ 904L etc.
- Carbon Steel** : ASTM A105/A694/F42/46/ 52/ 56/ 60/ 65/ 70/A350 LF3/A350 LF2, etc.
- Alloy Steel** : ASTM A182 F1/ F5/ F9/ F11/ F22/ F91 etc.
- Others** : Monel, Nickel, Inconel, Hastalloy, Titanium, etc.
- Size** : 1/2" NB TO 12" NB.



Flanges With Weldolet



Long Weldneck

- Stainless Steel** : ASTM A182 F304/304L/ 304H/ 316/ 316L/ 317/317L/321/310/347/ 904L etc.
- Carbon Steel** : ASTM A105/A694/F42/46/ 52/ 56/ 60/ 65/ 70/A350 LF3/A350 LF2, etc.
- Alloy Steel** : ASTM A182 F1/ F5/ F9/ F11/ F22/ F91 etc.
- Others** : Monel, Nickel, Inconel, Hastalloy, Titanium, etc.
- Size** : 1/2" NB TO 12" NB.



Orifice Flanges

PIPES :-



- Stainless Steel** : ASTM A312 TP 304/ 304U 304H/ 316/ 316U 317/ 317U 321/310/ 347/ 904L etc.
- High Nickel Alloy:** Monel, Nickel, Inconel, Hastalloy, Copper, Brass , Bronze, Titanium, Tantalum, Bismuth, Aluminium , High Speed Steel, Zinc, Lead, etc.
- Carbon Steel** : ASTM A53 GR. B/ A106 GR. B/API 5L GRADE B/ API 5L GR.X 42/ 46/52/ 56/ 60/65/70/ A333 GR. 3/ GR.6 etc.
- Alloy Steel** : ASTM A335 GR. P1/ P5/ P9/ P11/ P22/ P91 etc.
- Types** : Round , Square, Rectangular.
- Size** : Upto 24" NB. (Seamless & Welded)
- Wall Thickness** : Sch. 5S to Sch. XXS

STAINLESS STEEL SCHEDULE PIPE DIMENSION, WALL THICKNESS & WEGHT / METER

DESIGNATION		O/D	NOMINAL WALL THICKNESS														
OF DIAMETER		DIA	SCH.5S		SCH.5		SCH.10S		SCH.10		SCH.20S.		SCH.30		SCH.40S		SCH.40
(A)	(B)	METER MM	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK
6	1/8	10.3	1.0	0.23			1.2	0.27			1.5	.33			1.73	0.37	
8	1/4	13.72	1.2	0.37			1.65	0.49			2.00	.58			2.24	0.64	
10	3/8	17.2	1.2	0.47			1.65	0.63			2.00	.74			2.31	0.87	
15	1/2	21.3	1.65	0.81	1.65	0.81	2.11	1.02	2.11	1.02	2.5	1.15			2.77	1.29	
20	3/4	26.7	1.65	1.03	1.65	1.03	2.11	1.30	2.11	1.30	2.5	1.49			2.87	1.71	
25	1	33.4	1.65	1.31	1.65	1.31	2.77	2.12	2.77	2.12	3.00	2.24			3.38	2.54	
32	1-1/4	42.2	1.65	1.67	1.65	1.67	2.77	2.73	2.77	2.73	3.00	2.90			3.56	3.44	
40	1-1/2	48.3	1.65	1.93	1.65	1.93	2.77	3.15	2.77	3.15	3.00	3.35			3.68	4.11	
50	2	60.3	1.65	2.42	1.65	2.42	2.77	3.99	2.77	3.99	3.5	4.90			3.91	5.52	
65	2-1/2	73.0	2.11	3.75	2.11	3.75	3.05	5.34	3.05	5.34	3.5	6.00			5.16	8.77	
80	3	88.9	2.11	4.59	2.11	4.59	3.05	6.56	3.05	6.56	4.00	8.37			5.49	11.50	
90	3-1/2	101.6	2.11	5.25	2.11	5.25	3.05	7.53	3.05	7.53	4.00	9.62			5.74	13.78	
100	4	114.3	2.11	5.93	2.11	5.93	3.05	8.50	3.05	8.50	4.5	12.18			6.02	16.32	
125	5	141.3	2.77	9.61	2.77	9.61	3.40	11.74	3.40	11.74	5.00	16.80			6.55	22.10	
150	6	168.3	2.77	11.47	2.77	11.47	3.40	14.04	3.40	14.04	5.5	22.08			7.11	28.69	
200	8	219.1	2.77	15.00	2.77	15.00	3.76	20.27	3.76	20.27	6.35	33.82	7.04	37.38	8.18	43.20	
250	10	273.1	3.40	22.95	3.40	22.95	4.19	28.20	4.19	28.20	6.35	42.41	7.80	51.81	9.27	61.22	
300	12	323.9	3.96	31.72	4.19	33.60	4.57	36.54	4.57	36.54	6.35	50.48	8.38	66.20	9.53	75.01	10.31
350	14	355.6	3.96	34.86			4.78	41.99	6.35	55.53	7.92	68.95	9.53	82.58	9.53	82.58	11.13
400	16	406.4	4.19	42.20			4.78	48.07	6.35	63.61	7.92	79.03	9.53	94.70	9.53	94.70	12.70
450	18	457.2	4.19	47.46			4.78	54.15	6.35	71.69	7.92	89.10	11.13	124.32	9.53	106.83	14.27
500	20	508.0	4.78	60.23			5.54	69.70	6.35	79.76	9.53	118.93	12.70	157.51	9.53	118.93	15.06
550	22	558.8	4.78	65.95			5.54	76.75	6.35	87.84	9.53	131.07	12.70	173.66	9.53	131.07	15.88
600	24	609.6	5.54	83.80			6.35	95.92	6.35	95.92	9.53	143.20	14.27	212.72	9.53	143.20	17.45
650	26	660.4							7.92	129.40	12.70	205.97			9.53	155.32	
700	28	711.2							7.92	139.47	12.70	222.13	15.88	276.48	9.53	167.44	
750	30	762.0	6.35	120.15			7.92	149.55	7.92	149.55	12.70	238.28	15.88	296.68	9.53	179.56	
800	32	812.8							7.92	159.62	12.70	254.44	15.88	316.88	9.53	191.69	17.48
850	34	863.6							7.92	169.64	12.70	270.50	15.88	336.96	9.53	203.74	17.48
900	36	914.4							7.92	179.77	12.70	286.75	15.88	357.28	9.53	215.93	19.05

STAINLESS STEEL SCHEDULE PIPE DIMENSION, WALL THICKNESS & WEGHT / METER

WEIGHT KG/MTR	SCH 60		SCH 80 S		NOMINAL WALL THICKNESS						SCH.140		SCH.160		SCH.XXS						
	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	SCH.80		SCH.100		SCH.120		WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR					
					WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR											
			2.41	0.47																	
			3.02	0.82																	
			3.20	1.12																	
			3.73	1.64									4.78	1.98	7.47	2.59					
			3.91	2.23									5.56	2.94	7.82	3.69					
			4.55	3.29									6.35	4.30	9.09	5.53					
			4.85	4.53									6.35	5.59	9.70	7.88					
			5.08	5.49									7.14	7.35	10.16	9.69					
			5.54	7.60									8.74	11.29	11.07	13.65					
			7.01	11.60									9.53	15.15	14.02	20.72					
			7.62	15.51									11.13	21.67	15.24	28.11					
			8.08	18.92											16.15	34.56					
			8.56	22.66					11.13	28.75			13.49	34.05	17.12	41.66					
			9.53	31.44					12.70	40.90			15.88	49.87	19.05	58.31					
			10.97	43.21					14.27	55.03			18.26	68.59	21.95	79.2					
	10.81	53.90	12.70	65.63			15.06	76.93	18.24	91.73	20.62	102.47	23.01	112.97	22.23	108.00					
	12.20	82.80	12.70	82.80	15.06	97.27	18.24	116.38	21.41	134.90	25.40	155.50	28.58	174.95	25.40	155.5					
80.94	14.27	110.62	12.70	98.95	17.45	133.88	21.41	162.14	25.40	189.82	28.58	211.31	33.32	242.40	25.40	189.82					
96.00	15.06	128.42	12.70	109.04	19.05	160.54	23.80	197.74	27.76	227.88	31.75	257.47	35.71	286.04							
125.20	16.66	162.59	12.70	125.20	21.41	206.40	26.19	249.34	30.94	290.88	36.53	338.32	40.46	370.74							
158.27	19.05	209.00	12.70	141.35	23.80	258.29	29.36	314.54	34.93	369.34	39.67	414.74	45.24	466.67							
185.89	20.62	251.65	12.70	157.51	26.19	315.97	32.54	387.41	38.10	448.30	44.45	515.94	49.99	573.31							
216.04	22.23	298.55	12.70	173.66	28.57	379.70	34.92	457.83	41.27	535.17	47.62	609.30	53.97	682.57							
258.74	24.59	360.21	12.70	189.82	30.94	448.30	38.89	555.76	46.02	649.44	52.37	730.72	59.51	819.70							
			12.70	205.97	24.66D-t) t 1000 Wt/pam + formula Weight stainless steel pipe OD (mm) - W.T. (mm) XW.T. (mm) X 0.02466 = Kg. per mtr.																
			12.70	222.13																	
			1270	238.28																	
348.11			12.70	254.44																	
370.22			12.70	270.50																	
427.09			12.70	286.75																	

BUTT-WELDING FITTINGS ASTM

MATERIAL SPECIFICATION FOR SEAMLESS/WELDED BUTT-WELDING PIPE-FITTINGS.

SPECIFICATION (ASTM-2002)	CHEMICAL PROPERTIES						MECHANICAL PROPERTIES						OTHERS
	C%	Min%	P% (Max)	S% (Max)	Si%	Cr%	Mn%	Mo%	Ni%	U.T.S. (Min) Mpa	Y.S. (Min) Mpa	ELONG. (Min) L		Hardness (Max) BHN
STAINLESS STEEL													
A 403 Gr. WP 304L	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	-	8.0-12.0		485	170	28 20	-
A 403 Gr. WP 304LN	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	-	8.0-11.0		515	205	28 20	-
A 403 Gr. WP 309	0.20 Max	2.00 Max	0.045	0.030	1.00 Max	22.0-24.0	-	12.0-15.0		515	205	28 20	N% = 0.10-0.16
A 403 Gr. WP 310S	0.080 Max	2.00 Max	0.045	0.030	1.00 Max	24.0-26.0	-	19.0-22.0		515	205	28 20	-
A 403 Gr. WP 316L	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	16.0-18.0	2.0-3.0	10.0-14.0		485	170	28 20	-
A 403 Gr. WP 316LN	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	16.0-18.0	2.0-3.0	10.0-13.0		515	205	28 20	N% = 0.10-0.16
A 403 Gr. WP 317L	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	3.0-4.0	11.0-15.0		515	205	28 20	-
A 403 Gr. WP 321H	0.04-0.10	2.00 Max	0.045	0.030	1.00 Max	17.0-19.0	-	9.0-12.0		515	205	28 20	T1% = (5XC) - 0.70 T1% = (4XC) - 0.70
A 403 Gr. WP 347H	0.04-0.10	2.00 Max	0.045	0.030	1.00 Max	17.0-19.0	-	9.0-12.0		515	205	28 20	Cb% = (10XC) - 1.10 Cb% = (8XC) - 1.10
CARBON STEEL													
A 234 Gr. WPC	0.35 Max	0.29-1.06	0.050	0.058	0.10 Min	0.40 Max	0.15 Max	0.40 Max		485-655	275	30 20 197	Cu% = 0.40 Max, Va% = 0.08 Max, Ct% = 0.02 Max Cu% = 0.40 Max, Va% = 0.08 Max, Ct% = 0.02 Max
LOW TEMPERATURE CARBON STEEL													
A 420 Gr. WPL 3	0.20 Max	0.31-0.64	0.050	0.050	0.13-0.37	-	-	3.20-3.80		450-620	240	30 20 197	Cu% = 0.40 Max, Va% = 0.08 Max, Ct% = 0.02 Max Impact Test = -45°C, J = 17.3-18.6 Impact Test = -45°C, J = 17.3-18.6
ALLOY STEEL													
A 234 Gr. WP 5	0.15 Max	0.30-0.60	0.040	0.030	0.50 Max	4.0-6.0	0.44-0.65	-		415-585	205	30 20 217	
A 234 Gr. WP 11 CL1	0.05-0.15	0.30-0.60	0.030	0.030	0.50-1.0	1.0-1.5	0.44-0.65	-		415-585	205	30 20 197	
A 234 Gr. WP 11 CL3	0.05-0.20	0.30-0.80	0.040	0.040	0.50-1.0	1.0-1.5	0.44-0.65	-		520-690	310	30 20 197	
A 234 Gr. WP 12 CL2	0.05-0.20	0.30-0.80	0.045	0.045	0.60 Max	0.80-1.25	0.44-0.65	-		485-655	275	30 20 197	
A 234 Gr. WP 22 CL3	0.05-0.15	0.30-0.60	0.040	0.040	0.50 Max	1.90-2.60	0.87-1.13	-		520-690	310	30 20 197	Va% = 0.18-0.25, Cb% = 0.05-0.10, N% = 0.03-0.07, A% = 0.04 Max

BUTT WELD FITTINGS



Stainless Steel: ASTM A403 WP 304/ 304L/ 304H/310S/ 310H/ 316/ 316L/ 317/ 317L/ 321/310/347/ 347H/ 904L etc.

Carbon Steel: ASTM A234 WPB / A420 WPL3/ A420 WPL6/ MSS-SP-75 WPHY 42/46/52 /56/60/65/70

Alloy Steel: ASTM A234 WP1/ WP5/ WP9/ WP11/ WP22/WP91 etc.

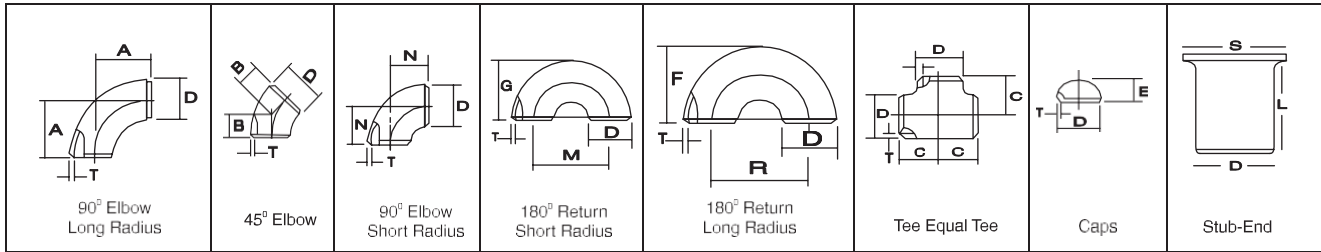
Others: Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead, etc.

Types: Elbow, Tee, Reducer, Return Bends, Stub-Ends, Cap, Collar, Cross, Insert etc.

Size: 1/4" NB TO 32" NB. (Seamless & Welded)

Wall Thickness: Sch. 5S To Sch. XXS.

DIMENSION OF BUTT-WELDING FITTING ANSI B-16.9 / B - 16.29

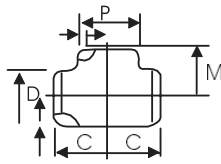


Nominal Pipe Size		Outside Diameter	Center to Face				Back to Face			Center to Center			Length 'L' MSS SP 43 B16.9	
INCH	MM	D	A R=1.5D	B	C	N R=1D	E	F	G	R	M	S	Short L	Long L
1/2	15	21.3	38.00	16.0	25.0		25.0	48.0		76.0		35.0	50.8	76.2
3/4	20	26.7	29.00	11.0	29.0	-	25.0	43.0	-	57.0		43.0	50.8	76.2
1	25	33.4	38.00	22.0	38.0		38.0	56.0		76.0	51.0	51.0	50.8	101.6
1.1/4	32	42.2	48.00	25.0	48.0	32.0	38.0	70.0	52.0	95.0	64.0	64.0	50.8	101.6
1.1/2	40	48.3	57.15	29.0	57.0		38.0	83.0		114.0	76.0	73.0	50.8	101.6
2	50	60.3	76.00	35.0	64.0	51.0	38.0	106.0	81.0	152.0	102.0	93.0	63.5	152.4
2.1/2	65	73.0	95.25	44.0	76.0		38.0	132.0		191.0	127.0	105.0	63.5	152.4
3	80	88.9	114.30	51.0	86.0	76.0	51.0	159.0	121.0	229.0	152.0	127.0	63.5	152.4
3.1/2	90	101.6	133.35	57.0	95.0		64.0	184.0		267.0	178.0	140.0	76.2	152.4
4	100	114.3	152.0	64.0	105.0	102.0	64.0	210.0	159.0	305.0	203.0	157.0	76.2	152.4
5	125	141.3	190.0	79.0	123.0		76.0	262.0		381.0	254.0	186.0	76.2	203.2
6	150	168.3	229.0	95.0	143.0	152.0	102.0	313.0	237.0	457.0	305.0	218.0	88.9	203.2
8	200	219.1	305.0	127.0	178.0		89.0	414.0		610.0	406.0	270.0	101.6	203.2
10	250	273.1	381.0	159.0	216.0	254.0	102.0	515.0	391.0	762.0	508.0	324.0	127.0	254.0
12	300	323.8	457.0	190.0	254.0		127.0	619.0		914.0	610.0	381.0	152.4	254.0
14	350	355.6	533.0	222.0	279.0	356.0	152.0	711.0	533.0	1067.0	711.0	413.0	152.4	305.0
16	400	406.4	610.0	254.0	305.0		165.0	813.0		1219.0	813.0	470.0	152.4	305.0
18	450	457.2	686.0	286.0	343.0	457.0	178.0	914.0	686.0	1372.0	914.0	533.0	152.4	305.0
20	500	508.0	762.0	318.0			203.0	1016.0		1524.0	1016.0	584.0	152.4	305.0
22	550	559.0	838.0	343.0	419.0	559.0	229.0	1118.0	838.0	1676.0	1118.0	614.4	152.4	305.0
24	600	610.0	914.0				254.0	1219.0		1829.0	1219.0	692.0	152.4	305.0
26	650	660.0	991.0	405.0	495.0	660.0	267.0							
28	700	711.0	1067.0				267.0							
30	750	762.0	1143.0	470.0	559.0	762.0	267.0							
32		813.0	1219.0				267.0							
34	850	864.0	1295.0	533.0	635.0	864.0	267.0							
36		914.4	1372.0				267.0							

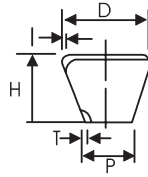


All Dimensions in Millimeters

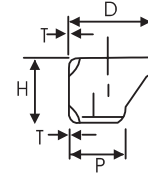
DIMENSION OF BUTT-WELDING FITTING ANSI B-16.9 / B - 16.28



REDUCING TEES



CONCENTRIC REDUCERS



ECCENTRIC REDUCERS

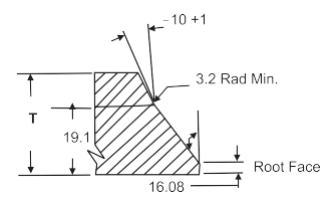
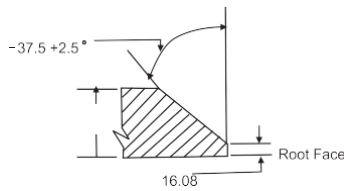
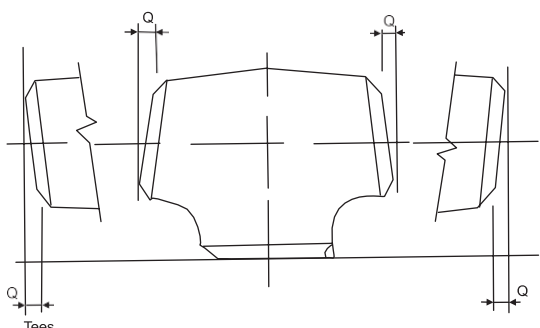
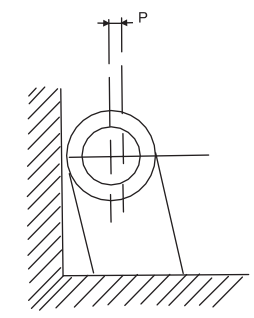
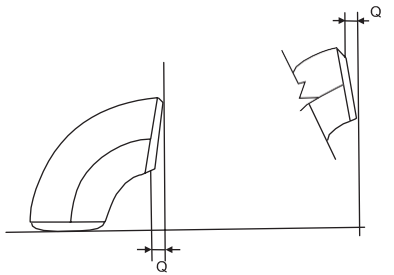
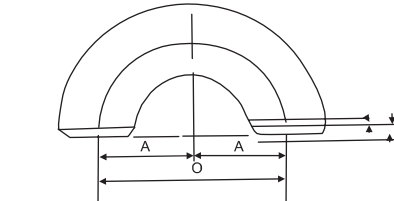
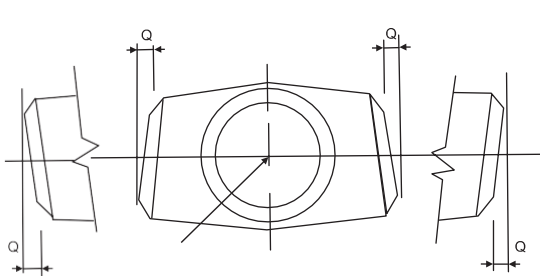
Nominal Pipe Size		Outside Diameter		Center to End		Length
INCH	MM				M	
1/2 x 3/8	15 x 10	21.3	17.1	25	25	-
						-
3/4 x 1/2	20 x 15	26.7	21.3	29	29	38
		26.7				38
1 x 3/4	25 x 20	33.4	26.7	38	38	51
		33.4				51
1 1/4 x 1	32 x 25	42.2	33.4	48	48	51
						51
1 1/4 x 1/2	32 x 15	42.2	21.3	48	48	51
						64
1 1/2 x 1	40 x 25	48.3	33.4	57	57	64
						64
1 1/2 x 1/2	40 x 15	48.3	21.3	57	57	64
						76
2 x 1 1/4	50 x 32	60.3	42.2	64	57	76
						76
2 x 3/4	50 x 20	60.3	26.7	64	44	76
						89
2 1/2 x 1 1/2	65 x 40	73.0	48.3	76	67	89
						89
2 1/2 x 1	65 x 25	73.0	33.4	76	57	89
						89
3 x 2	80 x 50	88.9	60.3	86	76	89
						89
3 x 1 1/4	80 x 32	88.9	42.2	86	70	89
						102
4 x 3	100 x 80	114.3	88.9	105	98	102
						102
4 x 2	100 x 50	114.3	60.3	105	89	102
						102
5 x 4	125 x 100	141.3	114.3	124	117	127
						127
5 x 3	125 x 80	141.3	88.9	124	111	127
						127
5 x 2	125 x 50	141.3	60.3	124	105	127
						140
6 x 4	150 x 100	168.3	114.3	143	130	140
						140
6 x 3	150 x 80	168.3	88.9	143	124	140
						140

Nominal Pipe Size		Outside Diameter		Center to End		Length
INCH	MM				M	
8 x 6	200 x 150	219.1	168.3	178	168	152
8 x 5	200 x 125	219.1	141.3	178	162	152
8 x 4	200 x 100	219.1	114.3	178	156	152
8 x 3 1/2	200 x 90	219.1	101.6	178	152	152
10 x 8	250 x 200	273.1	219.1	216	203	178
10 x 6	250 x 150	273.1	168.1	216	194	178
10 x 5	250 x 125	273.1	141.3	216	191	178
10 x 4	250 x 100	273.1	114.3	216	184	178
12 x 10	300 x 250	323.9	273.1	254	241	203
12 x 8	300 x 200	323.9	219.1	254	229	203
12 x 6	300 x 150	323.9	168.3	254	219	203
12 x 5	300 x 125	323.9	141.3	254	216	203
14 x 12	350 x 300	355.6	323.9	279	270	330
14 x 10	350 x 250	355.6	273.1	279	257	330
14 x 8	350 x 200	355.6	219.1	279	248	330
14 x 6	350 x 150	355.6	168.3	279	238	330
16 x 14	400 x 350	406.4	355.6	305	305	356
16 x 12	400 x 300	406.4	323.9	305	295	356
16 x 10	400 x 250	406.4	273.1	305	283	356
16 x 8	400 x 200	406.4	219.1	305	273	356
16 x 6	400 x 150	406.4	168.3	305	264	356
18 x 16	450 x 400	457.0	406.4	343	330	381
18 x 14	450 x 350	457.0	355.6	343	330	381
18 x 12	450 x 300	457.0	323.9	343	321	381
18 x 10	450 x 250	457.0	273.1	343	308	381
18 x 8	450 x 200	457.0	219.1	343	298	381
20 x 18	500 x 450	508.0	457.0	381	368	508
20 x 16	500 x 400	508.0	406.4	381	356	508
20 x 14	500 x 350	508.0	355.6	381	356	508
20 x 12	500 x 300	508.0	323.9	381	346	508
20 x 10	500 x 250	508.0	273.1	381	333	508
20 x 8	500 x 200	508.0	219.1	381	324	508
24 x 22	600 x 550	610.0	559.0	432	432	508
24 x 20	600 x 500	610.0	508.0	432	432	508
24 x 18	600 x 450	610.0	457.0	432	419	508
24 x 16	600 x 400	610.0	406.4	432	406	508
24 x 14	600 x 350	610.0	355.6	432	406	508
24 x 12	600 x 300	610.0	323.9	432	397	508
24 x 10	600 x 250	610.0	273.1	432	384	508

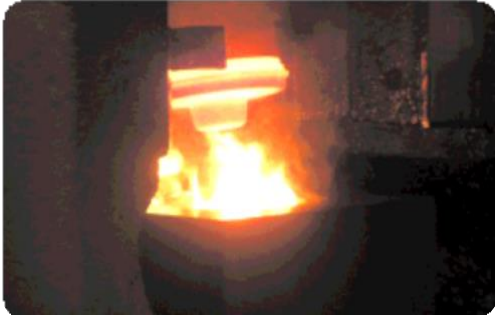
All Dimensions in Millimeters

DIMENSION TOLERANCE ANSI B 16.9/B 16.28 / MSS SP - 43

ALL FITTINGS				90°/60°/45° 30° ELBOWS & TEES		REDUCERS		180° RETURNS				CAPS		ANGULARITY TOLERANCE				
Nominal Pipe size INCH/MM	Outside Diameter at Bevel	Inside Dia Meter	Wall Thickness at End	Center to End	Overall Lenth Dimension	Center to End	Back to Face Dimension	Alignment of End Dimentions	Overall Lenth	Nominal Pipe Size	Off Angel Inch/mm	Off Plane						
				A,B,C,M		O					Q							
	(1) B16.9	MSS Sp43	(2) B16.9	B16.9	MSS SP43	B16.9	MSS SP43	B16.9	MSS SP43	B16.9	MSS SP43	B16.9	MSS SP43		B16.9	MSS SP75	B16.9	
1/2" - 2 1/2" 15 - 65	+1.6 - 0.8		±0.8		FROM 1/2" TO 18 15 TO 600	FROM 3/4"	FROM 1/2" - 24" 15 - 600	FROM 1/2" - 8" 15 - 200					±3	±3.17	1/2" - 4" 15 - 100	±1		±2
3" - 3 1/2" 80 - 90	±1.6	±0.80													5" - 8" 125 - 200	±2		±4
4" 100			±1.6		±2	±1.60	±2	±1.60	±6	±6.35	±6.0	±6.4	±1	±0.8	10" - 12" 250 - 300	±3	16" - 24" 400 - 600 1.6	±5
5" - 6" 125 - 150																		±7
8" 200	+2.4 -1.6	+1.60 -0.80													18" - 24" 450 - 600	±4		±10
10" - 18" 250 - 450	+4 -3.2	+2.38 -0.80	±3.2		±2.40		10" - 24" +2.38 250 - 600		±10	±10							26" - 36" 650 - 900 2.4	
20" - 24" 500 - 600	+6.4 -4.8	3.17 0.79													32" - 42" 800 - 1050	±5		±13
26" - 30" 650 - 750	+6.4 -4.8	±4.8	±4.8										±10		44" - 48" 1100 - 1200	±5	32" - 48" 950 - 1200 3.2	±20
32" - 48" 800 - 1200	+6.4 -4.8						FROM 26" - 48" 650 NB - 701200 NB ±5								42 - 48" 1050 - 1200	±5		±20



FORGED FLANGES



Stainless Steel : ASTM A182 F304/ 304L/ 304H/ 316/ 316L/ 317/ 317L/ 321/ 310/ 347/904L/ Etc.

Carbon Steel : ASTM A105/ A694 F42/ 46/ 52/ 56/ 60/ 65/ 70/ A350 LF3/ A350 LF2, Etc.

Alloy Steel : ASTM A 182 F1/ F5/ F9/ F11/ F22/ F91/ Etc.

Duplex Steel : 2205 (Duplex), 2507 (Super Duplex)
UNS - 31803, 32750, 32990

Others : Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead, etc.

Types : Weldneck, Slipon, Blind, Socket Weld, Lap Joint, Spectacles, Ring Joint, Oriface, Long Weldneck, Deck Flange, Etc.

Size : 1/8" NB TO 48" NB

Class : 150#, 300#, 400#, 600#, 900#, 1500# & 2500#.



Also as per the National & International Standard.



MANUFACTURING PROCESS



RAW - MATERIAL



CUTTING



HEAT TREATMENT



FORGING



MACHINING



TESTING



MARKING

PACKING

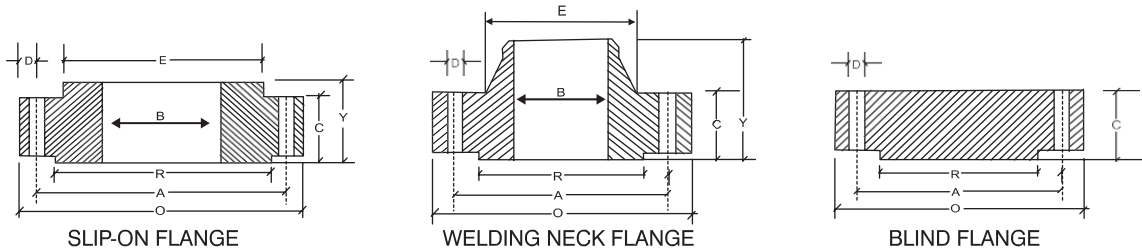
SHIPPING

FORGED FITTINGS & FLANGES ASTM

MATERIAL SPECIFICATION FOR FORGED FITTINGS & FLANGES

SPECIFICATION (ASTM-2002)	CHEMICAL PROPERTIES					MECHANICAL PROPERTIES					OTHERS			
	C%	Min%	P% (Max)	S% (Max)	Si%	Cr%	Ni%	Mo%	U.T.S. (Min) Mpa	Y.S. (Min) Mpa		ELONG. (Min) %	RED. AREA %	Hardness (Max) BHN
STAINLESS STEEL														
A 182 Gr. F 304	0.080 Max	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	8.0-11.0	-	515	205	30	50	-	
A 182 Gr. F 304L	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	8.0-13.0	-	485	170	30	50	-	
A 182 Gr. F 304H	0.04-0.10	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	8.0-11.0	-	515	205	30	50	-	
A 182 Gr. F 304LN	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	8.0-10.5	-	515	205	30	50	N ₂ =0.10-0.16	
A 182 Gr. F 309H	0.04-0.10	2.00 Max	0.045	0.030	1.00 Max	22.0-24.0	12.0-15.0	-	515	205	30	50	-	
A 182 Gr. F 310	0.25 Max	2.00 Max	0.045	0.030	1.00 Max	24.0-26.0	19.0-22.0	-	515	205	30	50	-	
A 182 Gr. F 316	0.080 Max	2.00 Max	0.045	0.030	1.00 Max	16.0-18.0	10.0-14.0	2.0-3.0	515	205	30	50	-	
A 182 Gr. F 316L	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	16.0-18.0	10.0-15.0	2.0-3.0	485	170	30	50	-	
A 182 Gr. F 316H	0.04-0.10	2.00 Max	0.045	0.030	1.00 Max	16.0-18.0	10.0-14.0	2.0-3.0	515	205	30	50	-	
A 182 Gr. F 316LN	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	16.0-18.0	11.0-14.0	2.0-3.0	515	205	30	50	N ₂ =0.10-0.16	
A 182 Gr. F 317	0.080 Max	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	11.0-15.0	3.0-4.0	515	205	30	50	-	
A 182 Gr. F 317L	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	11.0-15.0	3.0-4.0	485	170	30	50	-	
A 182 Gr. F 321	0.080 Max	2.00 Max	0.045	0.030	1.00 Max	17.0-19.0	9.0-12.0	-	515	205	30	50	TT%=(5xC)-0.70	
A 182 Gr. F 321H	0.04-0.10	2.00 Max	0.045	0.030	1.00 Max	17.0-19.0	9.0-12.0	-	515	205	30	50	TT%=(4XC)-0.70	
A 182 Gr. F 347	0.080 Max	2.00 Max	0.045	0.030	1.00 Max	17.0-20.0	9.0-13.0	-	515	205	30	50	Cb%=(10XC)-1.10	
A 182 Gr. F 347H	0.04-0.10	2.00 Max	0.045	0.030	1.00 Max	17.0-20.0	9.0-13.0	-	515	205	30	50	Cb%=(8XC)-1.10	
CARBON STEEL														
A 105	0.035 Max	0.60-1.05	0.035	0.040	0.10-0.35	0.30 Max	0.40 Max	0.12 Max	485	250	22	30	187	Cu%=0.40 Max, Va %= 0.08 Max
LOW TEMPERATURE CARBON STEEL														
A 350 Gr. LF 1	0.30 Max	0.60-1.35	0.035	0.040	0.15-0.30	0.30 Max	0.40 Max	0.12 Max	415-585	205	25	38	197	C ₁₀ %=0.40Max, C ₁₅ %=0.02 Max, Va %= 0.05 Max, Impact Test =-28.9°C, J=18 Min
A 350 Gr. LF 2	0.30 Max	0.60-1.35	0.035	0.040	0.15-0.30	0.30 Max	0.40 Max	0.12 Max	485-655	250	22	30	197	C ₁₀ %=0.40Max, C ₁₅ %=0.02 Max, Va %= 0.05 Max, Impact Test =-45.6°C, J=18 Min
A 350 Gr. LF 3	0.20 Max	0.90 Max	0.035	0.040	0.20-0.35	0.30 Max	3.30-3.70	0.12 Max	485-655	260	22	35	197	C ₁₀ %=0.40Max, C ₁₅ %=0.02 Max, Va %= 0.03 Max, Impact Test =-101°C, J=20 Min
ALLOY STEEL														
A 182 Gr. F 1	0.28 max	0.60-0.90	0.045	0.045	0.15-0.35	-	-	0.44-0.65	485	275	20	30	143-192	-
A 182 Gr. F 2	0.05-0.21	0.30-0.80	0.040	0.040	0.10-0.60	0.50-0.81	-	0.44-.65	485	275	20	30	143-192	-
A 182 Gr. F 5	0.15 max	0.30-0.60	0.030	0.030	0.50 Max	4.0-6.0	0.5 Max	0.44-0.65	485	275	20	35	143-217	-
A 182 Gr. F 9	0.15 max	0.30-0.60	0.030	0.030	0.50-1.00	8.0-10.0	-	0.30-1.10	585	380	20	40	179-217	-
A 182 Gr. F 11 CL1	0.05-0.15	0.30-0.60	0.030	0.030	0.50-1.00	1.0-1.50	-	0.44-0.65	415	205	20	45	121-174	-
A 182 Gr. F 11 CL2	0.10-0.20	0.30-0.80	0.040	0.040	0.50-1.0	1.0-1.50	-	0.40-0.65	485	275	20	30	143-207	-
A 182 Gr. F 11 CL3	0.10-0.20	0.30-0.80	0.040	0.040	0.50-1.0	1.0-1.50	-	0.44-0.65	515	310	20	30	156-207	-
A 182 Gr. F 12 CL1	0.05-0.15	0.30-0.60	0.045	0.045	0.50 Max	0.80-1.25	-	0.44-0.65	415	220	20	45	121-174	-
A 182 Gr. F 12 CL2	0.10-0.20	0.30-0.80	0.040	0.040	0.10-0.60	0.80-1.25	-	0.44-0.65	485	275	20	30	143-207	-
A 182 Gr. F 22 CL1	0.05-0.15	0.30-0.60	0.040	0.040	0.50 Max	2.0-2.5	-	0.87-1.13	415	205	20	35	170	-
A 182 Gr. F 22 CL3	0.05-0.15	0.30-0.60	0.040	0.040	0.50 Max	2.0-2.50	-	0.87-1.13	515	310	20	30	156-207	-
A 182 Gr. F 91	0.08-0.12	0.30-0.60	0.020	0.010	0.20-0.50	8.0-9.5	0.40 Max	0.85-1.05	585	415	20	40	248	C ₁₀ %=0.06-0.10, N ₂ %=0.03-0.07, Va %=0.18-0.25

DIMENSIONS OF FORGED FLANGES ANSI B 16.5



ASA 150 CLASS

Nominal Pipe Size (MM) (INCH.)								Lenght through Hub			Dia of Bore			Pipe Dia X	
15	1/2	88.9	60.3	15.9	4	11.1	30.2	15.9	47.6	15.9	22.3	22.9	34.9	9.5	21.33
25	1	107.9	79.4	15.9	4	14.3	49.2	17.5	55.6	17.5	34.5	35.0	50.8	12.7	33.40
40	1 1/2	127.0	98.4	15.9	4	17.5	65.1	22.2	61.9	22.2	49.5	50.0	73.0	15.9	48.26
65	2 1/2	177.8	139.7	19.0	4	22.2	90.5	28.6	69.8	28.6	74.7	75.4	104.8	19.0	73.02
100	4	228.6	190.5	19.0	8	23.8	134.9	33.3	76.2	33.3	116.1	116.8	157.2	23.8	114.30
150	6	279.4	241.3	22.2	8	25.4	192.1	39.7	88.9	39.7	170.7	171.4	215.9	27.0	168.27
250	10	406.4	361.9	25.4	12	30.2	304.8	49.2	101.6	49.2	276.3	277.4	323.8	33.3	273.05
350	14	533.4	476.2	28.6	12	34.9	400.0	57.1	127.0	79.4	359.1	360.2	412.7	41.3	355.60
450	18	635.0	577.8	31.7	16	39.7	504.8	68.3	139.7	96.8	461.8	462.3	533.4	49.2	457.20
600	24	812.8	749.3	34.9	20	47.6	663.6	82.5	152.4	111.1	615.9	615.9	692.1	63.5	609.60

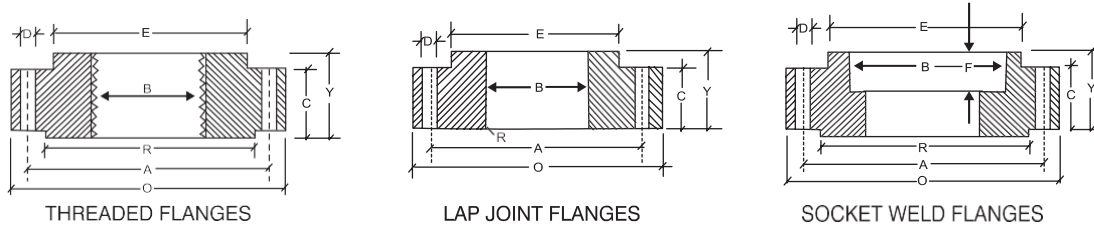
All Dimensions are in Millimeters • Flanges except Lap Joint will be furnished with (1.6mm) Raised Face, which is included in Thickness(C) and Lenght through Hub(Y).

ASA 300 CLASS

Nominal Pipe Size (MM) (INCH.)								Lenght through Hub			Dia of Bore			Pipe Dia X	
15	1/2	95.2	66.7	15.9	4	14.3	38.1	22.2	52.4	22.2	22.3	22.9	34.9	9.5	21.33
25	1	123.8	88.9	19.0	4	17.5	54.0	27.0	61.9	27.0	34.5	35.0	50.8	12.7	33.40
40	1 1/2	155.6	114.3	22.2	4	20.6	69.8	30.2	68.3	30.2	49.5	50.0	73.0	15.9	48.26
65	2 1/2	190.5	149.2	22.2	8	25.4	100.0	38.1	76.2	38.1	74.7	75.4	104.8	19.0	73.02
100	4	254.0	200.0	22.2	8	31.8	146.0	47.6	85.7	47.6	116.1	116.8	157.2	23.8	114.30
150	6	317.5	269.9	22.2	12	36.5	206.4	52.4	98.4	52.4	170.7	171.4	215.9	-	168.27
250	10	444.5	387.3	28.6	16	47.6	320.7	66.7	117.5	95.2	276.3	277.4	323.8	-	273.05
350	14	584.2	514.3	31.7	20	54.0	425.4	76.2	142.9	111.1	359.1	360.2	412.7	-	355.60
450	18	711.2	628.5	34.9	24	60.3	533.4	88.9	158.7	130.2	461.8	462.3	533.4	-	457.20
600	24	914.4	812.8	41.3	24	69.8	701.7	106.4	168.3	152.4	615.9	615.9	692.1	-	609.60

All Dimensions are in Millimeters • Flanges except Lap Joint will be furnished with (1.6mm) Raised Face, which is included in Thickness(C) and Lenght through Hub(Y).

DIMENSIONS OF FORGED FLANGES ANSI B 16.5



ASA 600 CLASS

Nominal Pipe Size (MM)	Flange Dia O	Dia of Bolt Circle A	Dia of Bolt Holes D	No. of Holes	Thk of Flange C	Dia of Hub E	Length through Hub			Dia of Bore		Dia of R/F R	Depth of Socket F	Pipe Dia X
							S/O & S/W Y	W/N Y	L/J Y	S/O & S/W B	L/J B			
15	95.2	66.7	15.9	4	14.3	38.1	22.2	52.4	22.3	22.3	22.8	34.9	9.5	21.33
25	123.8	88.9	19.0	4	17.5	54.0	27.0	61.9	26.9	34.5	35.0	50.8	12.7	33.40
40	155.6	114.3	22.2	4	22.2	69.8	31.7	69.8	31.7	49.5	50.0	73.0	15.8	48.26
65	190.5	149.2	22.2	8	28.6	100.0	41.3	79.4	41.1	74.7	75.4	104.8	19.0	73.02
100	273.0	215.9	25.4	8	38.1	152.4	54.0	101.6	53.8	116.1	116.8	157.2	-	114.30
150	355.6	292.1	28.6	12	47.6	222.2	66.7	117.5	66.5	170.7	171.4	215.9	-	168.27
250	508.0	431.8	34.9	16	63.5	342.9	85.7	152.4	111.2	276.3	277.4	323.8	-	273.05
350	603.2	527.0	38.1	20	69.9	431.8	93.7	165.1	127.0	359.1	360.1	412.7	-	355.60
450	742.9	654.0	44.4	20	82.6	546.1	117.5	184.1	152.4	461.8	462.3	533.4	-	457.20
600	939.8	838.2	50.8	24	101.6	717.5	139.7	203.2	184.1	615.9	615.9	692.1	-	609.60

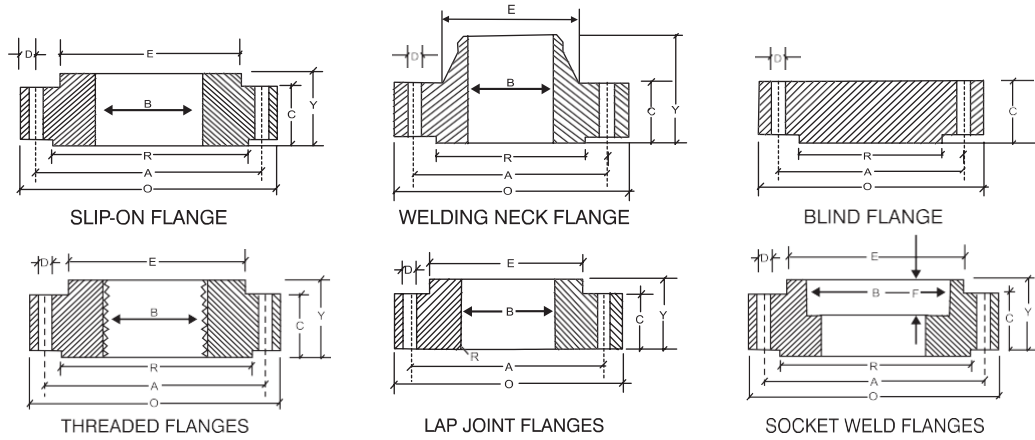
All Dimensions are in Millimeters • Flanges except Lap Joint will be furnished with(6.35mm) Raised Face, which is not included in Thickness(C) and Length through Hub(Y).

ASA 900 CLASS

Nominal Pipe Size (MM)	Flange Dia O	Dia of Bolt Circle A	Dia of Bolt Holes D	No. of Holes	Thk of Flange C	Dia of Hub E	Length through Hub			Dia of Bore		Dia of R/F R	Depth of Socket F	Pipe Dia X
							S/O & S/W Y	W/N Y	L/J Y	S/O & S/W B	L/J B			
15	120.6	82.5	22.2	4	22.2	38.1	31.7	60.3	31.7	22.3	22.8	34.9	9.5	21.33
25	149.2	101.6	25.4	4	28.6	52.4	41.3	73.0	41.1	34.5	35.0	50.8	12.7	33.40
40	177.8	123.8	28.6	4	31.8	69.8	44.4	82.5	44.4	49.5	50.0	73.0	15.8	48.26
65	244.5	190.5	28.6	8	41.3	123.8	63.5	104.8	63.5	74.7	75.4	104.8	19.0	73.02
100	292.1	234.9	31.7	8	44.4	158.7	69.8	114.3	69.8	116.0	116.8	157.2	-	114.30
150	381.0	317.5	31.7	12	55.6	234.9	85.8	139.7	85.8	170.6	171.4	215.9	-	168.27
250	546.1	469.9	38.1	16	69.8	368.3	107.9	184.1	127.0	276.3	277.3	323.8	-	273.05

All Dimensions are in Millimeters • Flanges except Lap Joint will be furnished with(6.35mm) Raised Face, which is not included in Thickness(C) and Length through Hub(Y).

DIMENSIONS OF FORGED FLANGES ANSI B 16.5



ASA 1500 CLASS

Nominal Pipe Size	Flange Dia	Dia of Bolt Circle	Dia of Bolt Holes	No. of Holes	Thk of Flange	Dia of Hub	Length Through Hub			Dia of Bore		Dia of R/F	Depth of Socket	Pipe Dia	
							S/O & S/W	W/N	L/J	S/O & S/W	L/J				
(MM) (INCH.)	O	A	D		C	E	Y	Y	Y	B	B	R	F	X	
For Dimensions from 1/2" to 2 1/2" kindly refer ASA 900 LBS Table.															
100	4	311.1	241.3	34.9	8	54.0	161.9	90.5	123.0	90.4	116.1	116.8	157.2	-	114.30
150	6	393.7	317.5	38.1	12	82.6	228.6	119.1	171.4	119.1	170.7	171.4	215.9	-	168.27
250	10	584.2	482.6	50.8	12	107.9	368.3	158.7	254.0	177.8	276.3	277.3	323.8	-	273.05

All Dimensions are in Millimeters • Flanges except Lap Joint will be furnished with(6.35mm) Raised Face, which is not included in Thickness(C) and Length through Hub(Y).

ASA 2500 CLASS

All Dimensions are in Millimeters • Flanges except Lap Joint will be furnished with(6.35mm) Raised Face, which is not included in Thickness(C) and Length through Hub(Y).

DIMENSIONS TOLERANCES OF FORGED FLANGES ANSI B 16.5

Threaded, Slipon, Lapjoint,
Socket Welding & Blind

Welding Neck

Outside Diameter	O.D. is 600 or smaller O. D. over 600	± 1.6 ± 3.1	Outside Diameter	O.D. is 50 or smaller O. D. over 600	± 1.6 ± 3.1
Inside Diameter (bore)	250 and smaller 12 through 450 500 and larger	± 0.7 ± 1.6 ± 3.1 -1.6	Inside Diameter slip lap joint:	threaded: to standard gauge limits socket-welding: 250 and larger 300 and larger	(bore) +0.7 -0.0 +1.6 -0.0
Diameter of contact face	1.6 raise face 6.3 raised face: tongue & grooved male & female	± 0.7 ± 0.4	Diameter of counter bore	threaded 250 and smaller 300 and larger	+0.7 -0.0 +1.6 -0.0
Diameter of hub at base	When E is 600 or smaller When E is over 600	± 1.6 ± 3.1	Outside diameter hub	300 and smaller 350 and larger	+2.3 -1.6 ± 3.1
Diameter hub at point of welding	125 and smaller 150 and larger	+0.7 ± 0.7 +4.0 ± 0.0	Diameter of contact face	1.6 raised face 6.3 raised: tongue & grooved male & female	± 0.7 ± 0.4
Thickness	450 and smaller 500 and larger	+3.1 ± 0.0 +4.7 ± 0.0	Thickness	450 and smaller 500 and larger	+3.1 -0.0 +4.7 -0.0
Length through hub	250 and smaller 300 and larger	± 1.6 ± 3.1	Length through hub	250 and smaller 300 and larger	± 1.6 ± 3.1
Drilling	bolt circle bolt hole spacing	± 1.6 ± 0.7	Drilling	bolt circle bolt hole spacing	± 1.6 ± 0.7
	essentricity with respect to bore	0.7 max		essentricity with respect to bore	0.7 max

WELDING NECK FLANGE BORE

NPS (NB)	O.D. (MM)	Sch. 10	Sch. 20	Sch. 30	Sch. Std	Sch. 40	Sch. XS	Sch. 80	Sch. 120	Sch. 160	Sch. XXS
15	21.33	17.1	-	-	15.7	15.7	13.8	13.8	-	11.7	6.4
25	33.40	27.9	-	-	26.6	25.4	24.3	24.3	-	20.7	15.2
40	48.26	42.7	-	-	40.8	40.8	38.1	38.1	-	33.7	27.9
65	73.02	66.9	-	-	62.4	62.4	59.0	59.0	-	53.9	44.9
100	114.30	108.2	-	-	102.2	102.2	97.1	97.1	92.0	87.3	80.0
150	168.27	161.5	-	-	154.0	154.0	146.3	146.3	139.7	131.7	124.3
250	273.05	264.7	260.3	257.4	254.5	254.5	247.6	242.8	230.1	215.9	222.2
350	355.60	346.2	337.8	336.5	336.5	333.3	330.2	317.5	300.0	284.1	-
450	457.20	447.5	441.1	434.9	438.1	428.6	431.8	409.5	387.3	366.7	-
600	609.60	596.9	590.5	581.0	590.5	574.6	584.2	547.6	517.5	490.5	-

ANSI FLANGES WEIGHTS (KGS)

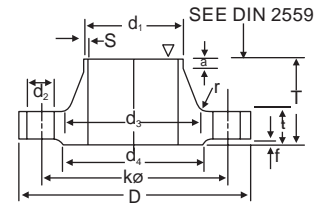
N. B.	150 lbs		300 lbs		600 lbs		900 lbs	
Size	WN	SO	WN	SO	WN	SO	WIN	SO
3/4"	0.9	0.7	1.4	1.2	1.6	1.4	2.7	2.5
1 1/4"	1.5	1.2	2.2	1.8	2.6	2.1	4.5	4.1
2"	2.7	2.2	3.6	3.2	4.7	3.8	11.3	10.3
3"	5.1	4.1	7.3	6.1	8.7	7.3	15	12.3
4"	7.5	5.6	11.9	10	18.3	15.8	24	20.5
6"	11	7.8	20	16.2	37	29.5	50	43
10"	25	18	44.3	35	91	71	125	105
14"	51	37	88	72	150	96	198	158
18"	71	50	138	115	240	175	320	258
24"	120	90	240	210	363	315	680	608





6BAR

**DIN 2573 SLIP - ON FLANGES
 DIN 2527 BLIND FLANGES
 DIN 2631 WELDING NECK FLANGES**



WELDING NECK

Unit : mm

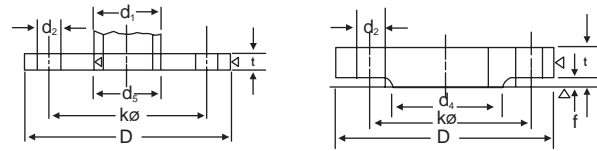
Welding Neck Flanges For Nominal Pressure 6

Bore		Common Dimension					Hub				Raise Face		Drilling			Approx Weight (kg)			
Nominal Bore	d ₁	D	t			K	T	d ₃	s	r	a ≈	d ₄	f	No. of Bolt	Dia. of Bolt		d ₂	DIN 2573	DIN 2631
			Welding neck	slip-on	Blind														
10	14 17.2*)	75	12	12	12	50	28	22 26	1.8	4	6	35	2	4	M10	-	11.5	0.036	0.335
15	20 21.3*)	80	12	12	12	55	30	28 30	2.0	4	6	40	2	4	M10	-	11.5	0.410	0.392
20	25 26.9*)	90	14	14	14	65	32	35 38	2.3	4	6	50	2	4	M10	-	11.5	0.600	0.592
25	30 33.7*)	100	14	14	14	75	35	40 42	2.6	4	6	60	2	4	M10	-	11.5	0.740	0.747
32	38 42.4*)	120	14	16	14	90	35	50 55	2.6	6	6	70	2	4	M12	(1/2")	14	1.19	1.05
40	44.5 48.3*)	130	14	16	14	100	38	58 62	2.6	6	7	80	3	4	M12	(1/2")	14	1.39	1.18
50	57 60.3*)	140	14	16	14	110	38	70 74	2.9	6	8	90	3	4	M12	(1/2")	14	1.53	1.34
65	76.1*)	160	14	16	14	130	38	88	2.9	6	9	110	3	4	M12	(1/2")	14	1.89	1.67
80	88.9*)	190	16	18	16	150	42	102	3.2	8	10	128	3	4	M16	(5/8")	18	2.98	2.71
100	108 114.3*)	210	16	18	16	170	45	122 130	3.6	8	10	148	3	4	M16	(5/8")	18	3.46	3.24
125	133 139.7*)	240	18	20	18	200	48	148 155	4.0	8	10	178	3	8	M16	(5/8")	18	4.60	4.49
150	159 168.3*)	265	18	20	18	225	48	172 184	4.5	10	12	202	3	8	M16	(5/8")	18	5.22	5.15
200	216 219.1*)	320	20	22	20	280	55	230 236	5.9	10	15	258	3	8	M16	(5/8")	18	7.15	7.78
250	267 273*)	375	22	24	22	335	60	282 290	6.2	12	15	312	3	12	M16	(5/8")	18	9.61	10.8
300	381 323.9*)	440	22	24	22	395	62	335 342	7.1	12	15	365	4	12	M20	(3/4")	23	12.6	14.0
350	355.6*)	490	22	26	22	445	62	385	7.1	12	15	415	4	12	M20	(3/4")	23	15.6	16.1
400	406.4*)	540	22	28	22	495	65	438	7.1	12	15	455	4	16	M20	(3/4")	23	18.4	18.3
500	508*)	645	24	30	24	600	68	538	7.1	12	15	570	4	20	M20	(3/4")	23	24.5	24.6
600	609.6*)	755	24			705	70	640	7.1	12	16	670	5	20	M24	(7/8")	27		
700	711.2*)	860	24			810	70	740	7.1	12	16	775	5	24	M24	(7/8")	27		
800	812.8*)	975	24			920	70	842	7.1	12	16	880	5	24	M27	(1")	30		
900	914.4*)	1075	26			1020	70	942	7.1	12	16	980	5	24	M27	(1")	30		
1000	920 1016*) 1020	1175	26			1120	70	1045	7.1	16	16	1080	5	28	M27	(1")	30		

Out side diameter of pipe complies with ISO recommendation R64

10BAR

DIN 2576 SLIP - ON FLANGES
DIN 2527 BLIND FLANGES
DIN 2632 WELDING NECK FLANGES



Welding Neck Flanges For Nominal Pressure 10

SLIP-ON

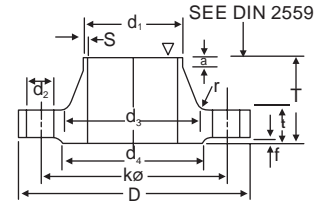
BLIND

Unit : mm

Bore		Common Dimension					Hub				Raise Face		Drilling			Approx Weight (kg)		
Nominal Bore	d ₁	D	t			K	T	d ₃	s	r	a ≈	d ₄	f	No. of Bolt	Dia. of Bolt	d ₂	DIN 2576	DIN 2632
			Welding neck	slip-on	Blind													
10	14 17.2*)	90	14	14	14	60	35	25 28	1.8	4	6	40	2	4	M12 (1.2")	14	0.163	0.580
15	20 21.3*)	95	14	14	14	65	35	30 32	2.0	4	6	45	2	4	M12 (1.2")	14	0.675	0.648
20	25 26.9*)	105	16	16	16	75	38	38 40	2.3	4	6	58	2	4	M12 (1.2")	14	0.947	0.952
25	30 33.7*)	115	16	16	16	85	38	42 45	2.6	4	6	68	2	4	M12 (1.2")	14	1.14	1.14
32	38 42.4*)	140	16	16	16	100	40	52 56	2.6	6	6	78	2	4	M16 (5/8")	18	1.66	1.69
40	44.5 48.3*)	150	16	16	18	110	42	60 64	2.6	6	7	88	3	4	M16 (5/8")	18	1.89	1.86
50	57 60.3*)	165	18	18	18	125	45	72 75	2.9	6	8	102	3	4	M16 (5/8")	18	2.51	2.53
65	76.1*)	185	18	18	18	145	45	90	2.9	6	10	122	3	4	M16 (5/8")	18	3.00	3.06
80	88.9*)	200	20	20	20	160	50	105	3.2	8	10	138	3	4	M16 (5/8")	18	3.79	3.70
100	108 114.3*)	220	20	20	20	180	52	125 131	3.6	8	12	158	3	8	M16 (5/8")	18	4.20	4.62
125	133 139.7*)	250	22	22	22	210	55	150 156	4.0	8	12	188	3	8	M16 (5/8")	18	5.71	6.30
150	159 168.3*)	285	22	22	22	240	55	175 184	4.5	10	12	212	3	8	M20 (3/4")	23	6.72	7.75
200	216 219.1*)	340	24	24	24	295	62	232 235	5.9	10	16	268	3	8	M20 (3/4")	23	9.50	11.3
250	267 273*)	395	26	26	26	350	68	285 292	6.3	12	16	320	3	12	M20 (3/4")	23	12.5	14.7
300	381 323.9*)	445	26	26	28	400	68	335 344	7.1	12	16	370	4	12	M20 (3/4")	23	14.4	17.6
350	355.6*)	505	26	28	30	460	68	385	7.1	12	16	430	4	16	M20 (3/4")	23	20.6	21.4
400	406.4*)	565	26	32	32	515	72	440	7.1	12	16	482	4	16	M24 (7/8")	27	27.9	26.1
500	508*)	670	28	38	34	620	75	542	7.1	12	16	585	4	20	M24 (7/8")	27	41.1	34.7
600	609.6*)	780	28			725	80	642	7.1	12	18	685	5	20	M27 (1")	30		
700	711.2*)	895	30			840	80	754	8.0	12	18	800	5	24	M27 (1")	30		
800	812.8*)	1015	32			950	90	850	8.0	12	18	905	5	24	M30 (1.1/8")	30		
900	914.4*)	1115	34			1050	95	950	10.0	12	20	1005	5	28	M30 (1.1/8")	33		
1000	1016*)	1230	34			1160	95	1052	10.0	16	20	1110	5	28	M33 (1 1/4")	36		

Out side diameter of pipe complies with ISO recommendation R64

16BAR **DIN 2543 SLIP - ON FLANGES**
DIN 2527 BLIND FLANGES
DIN 2633 WELDING NECK FLANGES



WELDING NECK

Welding Neck Flanges For Nominal Pressure 16

Unit : mm

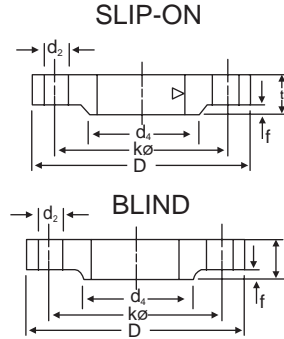
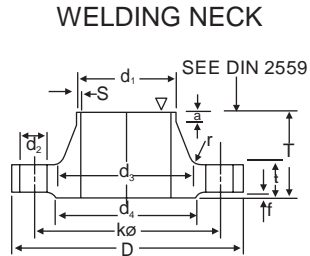
Bore		Common Dimension					Hub				Raise Face		Drilling			Approx Weight (kg)			
Nominal Bore	d ₁	D	t			K	T	d ₃	s	r	a ≈	d ₄	f	No. of Bolt	Dia. of Bolt		d ₂	DIN 2543	DIN 2633
			Welding neck	slip-on (No-hub)	Blind														
10	14 17.2*)	90	14	14	14	60	35	25 28	1.8	4	6	40	2	4	M12 (1.2")	14	0.63	0.580	
15	20 21.3*)	95	14	14	14	65	35	30 32	2.0	4	6	45	2	4	M12 (1.2")	14	0.72	0.648	
20	25 26.9*)	105	16	16	16	75	38	38 40	2.3	4	6	58	2	4	M12 (1.2")	14	1.01	0.952	
25	30 33.7*)	115	16	16	16	85	38	42 45	2.6	4	6	68	2	4	M12 (1.2")	14	1.23	1.14	
32	38 42.4*)	140	16	16	16	100	40	52 56	2.6	6	6	78	2	4	M16 (5/8")	18	1.80	1.69	
40	44.5 48.3*)	150	16	16	16	110	42	60 64	2.6	6	7	88	3	4	M16 (5/8")	18	2.09	1.86	
50	57 60.3*)	165	18	18	18	125	45	72 75	2.9	6	8	102	3	4	M16 (5/8")	18	2.88	2.53	
65	76.1*)	185	18	18	18	145	45	90	2.9	6	10	122	3	4	M16 (5/8")	18	3.66	3.06	
80	88.9*)	200	20	20	20	160	50	105	3.2	8	10	138	3	8	M16 (5/8")	18	4.77	3.70	
100	108 114.3*)	220	20	20	20	180	52	125 131	3.6	8	12	158	3	8	M16 (5/8")	18	5.65	4.62	
125	133 139.7*)	250	22	22	22	210	55	150 156	4.0	8	12	188	3	8	M16 (5/8")	18	8.42	6.30	
150	159 168.3*)	285	22	22	22	240	55	175 184	4.5	10	12	212	3	8	M20 (3/4")	23	10.4	7.75	
200	216 219.1*)	340	24	24	24	295	62	232 235	5.9	10	16	268	3	12	M20 (3/4")	23	16.1	11.0	
250	267 273*)	405	26	26	26	355	70	285 292	6.3	12	16	320	3	12	M24 (7/8")	27	24.9	15.6	
300	381 323.9*)	460	28	28	28	410	78	338 344	7.1	12	16	378	4	12	M24 (7/8")	27	35.1	22.0	
350	355.6*)	520	30	30	30	470	82	390	8.0	12	16	438	4	16	M24 (7/8")	27	47.8	28.7	
400	406.4*)	580	32	32	32	525	85	445	8.8	12	16	490	4	16	M27 (1")	30	63.5	36.3	
500	508*)	715	34	36	34	650	90	548	8.0	12	16	610	4	20	M30 (1 1/8")	33	102.0	59.3	
600	609.6*)	840	36	40		770	95	652	8.8	12	18	725	5	20	M33 (1 1/4")	36			
700	711.2*)	910	36			840	100	755	8.8	12	18	795	5	24	M33 (1 1/4")	36			
800	812.8*)	1025	38			950	105	855	10.0	12	20	900	5	24	M36 (1 3/8")	39			
900	914.4*)	1125	40			1050	110	955	10.0	12	20	1000	5	28	M36 (1 3/8")	39			

Out side diameter of pipe complies with ISO recommendation R64

1000	1016*) 1020	1255	42			1170	120	1058	10.0	16	20	1115	5	28	M39	(1 1/2")	42	
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40BAR

**DIN 2545 SLIP - ON FLANGES
 DIN 2527 BLIND FLANGES
 DIN 2635 WELDING NECK FLANGES**



Welding Neck Flanges For Nominal Pressure 40

Unit : mm

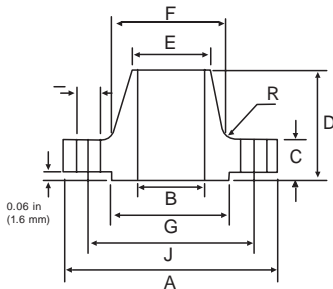
Bore		Common Dimension					Hub				Raise Face		Drilling		Approx Weight (kg)			
Nominal Bore	d ₁	D	t			K	T	d ₃	s	r	a ≈	d ₄	f	No. of Bolt	Di. of Bolt	d ₂	DIN 2545	DIN 2635
			Welding neck	slip-on (No-hub)	Blind													
10	14 17.2*)	90	16	16	16	60	35	25 28	1.8	4	6	40	2	4	M12 (1.2")	14	0.72	0.661
15	20 21.3*)	95	16	16	16	65	38	30 32	2.0	4	6	45	2	4	M12 (1.2")	14	0.81	0.746
20	25 26.9*)	105	18	18	18	75	40	38 40	2.3	4	6	58	2	4	M12 (1.2")	14	1.24	1.06
25	30 33.7*)	115	18	18	18	85	40	42 46	2.6	4	6	68	2	4	M12 (1.2")	14	1.38	1.29
32	38 42.4*)	140	18	18	18	100	42	52 56	2.6	6	6	78	2	4	M16 (5/8")	18	2.03	1.88
40	44.5 48.3*)	150	18	18	18	110	45	60 64	2.6	6	7	88	3	4	M16 (5/8")	18	2.35	2.33
50	57 60.3*)	165	20	20	20	125	48	72 75	2.9	6	8	102	3	4	M16 (5/8")	18	3.20	2.82
65	76.1*)	185	22	22	22	145	52	90	2.9	6	10	122	3	8	M16 (5/8")	18	4.29	3.74
80	88.9*)	200	24	24	24	160	58	105	3.2	8	12	138	3	8	M16 (5/8")	18	5.88	4.75
100	108 114.3*)	235	24	24	24	190	65	128 134	3.6	8	12	162	3	8	M20 (3/4")	23	7.54	6.52
125	133 139.7*)	270	26	26	26	220	68	155 162	4.0	8	12	188	3	8	M24 (7/8")	27	10.8	9.07
150	159 168.3*)	300	28	28	28	250	75	182 192	4.5	10	12	218	3	8	M24 (7/8")	27	14.5	11.80
(175)	(191) 193.7*)	350	32	30	32	295	82	251 218	5.6	10	15	260	3	12	M27 (1")	30	22.1	18.2
200	216 291.1*)	375	34	34	34	320	88	240 244	6.3	10	16	385	3	12	M27 (1")	30	27.2	21.5
250	267 273*)	450	38	38	38	385	105	298 306	7.1	12	18	345	3	12	M30 (1 1/8")	33	43.8	34.9
300	318 323.9*)	515	42	42	42	450	115	352 362	8.0	12	18	410	4	16	M30 (1 1/8")	33	63.3	49.7
350	355.6*	580	46	46	46	510	125	408	8.8	12	20	565	4	16	M33 (1 1/4")	36	89.5	68.1
400	406.4*) 419	660	50	50	50	585	135	462	11.0	12	20	535	4	16	M36 (1 1/8")	39	127.0	96.5
500	508*) 521	744	52	52	52	670	140	562	142	12	20	615	4	20	M39 (1 1/8")	42	172.0	117.0

Out side diameter of pipe complies with ISO recommendation R64

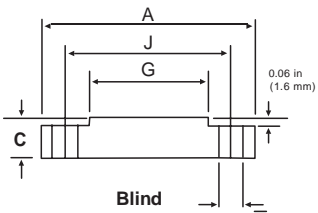


ASME B 16.47 SERIES B (API 605) FLANGES

Class 150 lb



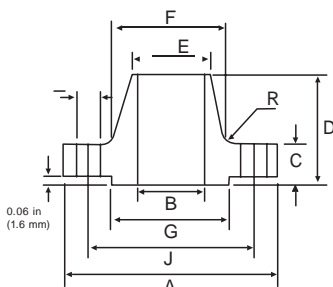
Weld Neck



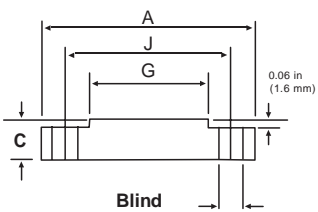
Blind

Pipe	Flange Data			Hub Data		Raised Face	Drilling Data			Radius	
Nominal Pipe Size	A	C	D	E	F	G	H	I	J	R	
	Overall Diameter	WNF Flange Thickness min	Blind Flange Thickness min	Overall Length WNF	Diameter at Weld Bevel	Hub Diameter	Face Diameter	Number of Holes	Bolt Hole Diameter	Diameter of Circle of Holes	Fillet
	mm	mm	mm	mm	mm	mm	mm		mm	mm	mm
26	785.38	41.15	44.45	88.90	661.92	684.28	711.20	36	22.35	744.47	9.65
28	836.68	44.45	47.75	95.25	712.72	735.08	762.00	40	22.35	795.27	9.65
30	887.48	44.45	50.80	100.08	763.52	787.40	812.80	44	22.35	846.07	9.65
32	941.32	45.97	53.85	107.95	814.32	839.72	863.60	48	22.35	900.18	9.65
34	1004.8	49.28	57.15	110.24	865.12	892.05	920.75	40	25.40	957.33	9.65
36	1057.1	52.32	58.67	117.35	915.92	944.63	971.55	44	25.40	1009.7	9.65
38	1124.0	53.85	63.50	123.95	968.25	996.95	1022.4	40	28.45	1069.8	9.65
40	1174.8	55.63	66.55	128.52	1019.0	1049.3	1079.0	44	28.45	1120.6	9.65
42	1225.6	58.67	68.33	133.35	1069.8	1101.9	1130.3	48	28.45	1171.4	11.18
44	1276.4	60.45	71.37	136.65	1120.6	1152.7	1181.1	52	28.45	1222.2	11.18
46	1341.4	61.98	74.68	144.53	1171.4	1205.0	1234.9	40	31.75	1284.2	11.18
48	1392.2	65.02	77.72	149.35	1222.2	1257.3	1289.1	44	31.75	1335.0	11.18

Class 300 lb



Weld Neck



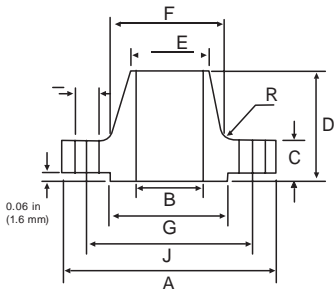
Blind

Pipe	Flange Data			Hub Data		Raised Face	Drilling Data			Radius	
Nominal Pipe Size	A	C	D	E	F	G	H	I	J	R	
	Overall Diameter	WNF Flange Thickness min	Blind Flange Thickness min	Overall Length WNF	Diameter at Weld Bevel	Hub Diameter	Face Diameter	Number of Holes	Bolt Hole Diameter	Diameter of Circle of Holes	Fillet
	mm	mm	mm	mm	mm	mm	mm		mm	mm	mm
26	866.65	88.90	88.90	144.53	665.53	701.55	736.60	32	35.05	803.15	14.22
28	920.75	88.90	88.90	149.35	716.03	755.65	787.40	36	35.05	857.25	14.22
30	990.60	93.73	93.73	157.99	768.35	812.80	844.55	36	38.10	977.90	15.75
32	1054.1	103.12	103.12	168.15	819.15	863.60	901.70	32	41.15	977.90	15.75
34	1107.9	103.12	103.12	180.85	920.75	965.20	1009.7	36	44.45	1089.2	15.75
36	1171.4	103.12	103.12	180.85	920.75	965.20	1009.7	32	44.45	1089.2	15.75
38	1222.2	111.25	111.25	192.02	971.55	1016.0	1060.5	36	44.45	1190.8	15.75
40	1273.0	115.82	115.82	198.37	1022.4	1066.8	1114.6	40	44.45	1190.8	15.75
42	1333.3	119.13	119.13	204.72	1074.7	1117.6	1168.4	36	47.75	1295.4	15.75
44	1384.3	127.00	127.00	214.38	1125.5	1173.2	1219.2	40	47.75	1295.4	15.75
46	1460.5	128.52	130.05	222.25	1176.3	1228.9	1270.0	36	50.80	1365.3	15.75
48	1511.3	128.52	128.52	134.87	223.77	1227.1	1327.2	40	50.80	1416.1	15.75

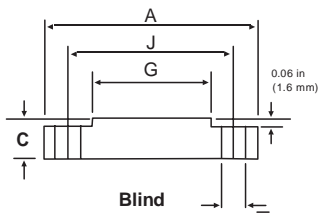
ASME B 16.47 Series B flanges are API 605 flanges. API 605 has been cancelled. Dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter. Flat face flanges may be provided at full thickness, C, or with raised face removed (the latter is nonstandard) WNF = Weld Neck Flange. The large end of the hub may be straight or tapered.



ASME B 16.47 Series A (API 605) Flanges Class 150 lb



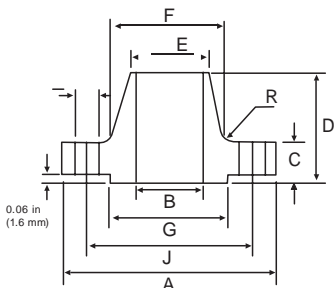
Weld Neck



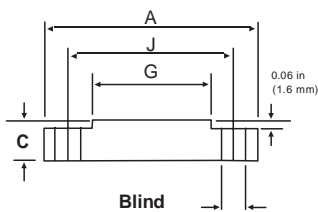
Blind

Pipe Nominal Pipe Size	Flange Data				Hub Data		Raised Face	Drilling Data			Radius
	A	C		D	E	F	G	H	I	J	R
	Overall Diameter	WNF Flange Thickness min	Blind Flange Thickness min	Overall Length WNF	Diameter at Weld Bevel	Hub Diameter	Face Diameter	Number of Holes	Bolt Hole Diameter	Diameter of Circle of Holes	Fillet
	mm	mm	mm	mm	mm	mm	mm		mm	mm	mm
22	749.30	45.97	45.97	149.35	558.80	609.60	641.35	20	35.05	692.15	9.65
26	869.95	68.33	69.33	120.65	660.40	676.15	749.30	24	35.05	806.45	9.65
28	927.10	71.37	71.37	125.48	711.20	726.95	800.10	28	35.05	863.60	11.18
30	984.75	74.68	74.68	136.65	762.00	781.05	857.25	28	35.05	914.40	11.18
32	1060.5	81.03	81.03	144.53	812.80	831.85	914.40	28	41.15	977.90	11.18
34	1111.3	82.55	82.55	149.35	863.60	882.65	965.20	32	41.15	1028.7	12.70
36	1168.4	90.42	90.42	157.23	914.40	933.45	1022.4	32	41.15	1085.9	12.70
38	1238.3	87.38	87.38	157.23	965.20	990.60	1073.2	32	41.15	1149.4	12.70
40	1289.1	90.42	90.42	163.58	1016.0	1041.4	1124.0	36	41.15	1200.2	12.70
42	1346.2	96.77	96.77	171.45	1066.8	1092.2	1193.8	36	41.15	1257.3	12.70
44	1403.4	101.60	101.60	177.80	1117.6	1143.0	1244.6	40	41.15	1314.5	12.70
46	1454.2	103.12	103.12	185.67	1168.4	1196.9	1295.4	40	41.25	1365.3	12.70
48	1511.3	107.95	107.95	192.02	1219.2	1247.7	1358.9	44	41.15	1422.4	12.70

Class 300 lb



Weld Neck



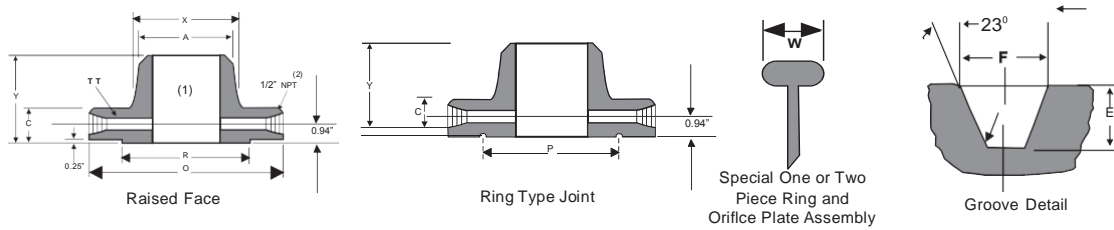
Blind

Pipe Nominal Pipe Size	Flange Data				Hub Data		Raised Face	Drilling Data			Radius
	A	C		D	E	F	G	H	I	J	R
	Overall Diameter	WNF Flange Thickness min	Blind Flange Thickness min	Overall Length WNF	Diameter at Weld Bevel	Hub Diameter	Face Diameter	Number of Holes	Bolt Hole Diameter	Diameter of Circle of Holes	Fillet
	mm	mm	mm	mm	mm	mm	mm		mm	mm	mm
22	838.20	66.65	66.65	165.10	558.80	641.35	641.35	24	41.15	742.95	9.65
26	971.55	79.25	84.07	184.15	660.40	720.85	749.30	28	44.45	876.30	9.65
28	1035.1	85.85	90.42	196.85	711.20	774.20	800.10	28	44.45	876.30	9.65
30	1092.2	91.95	95.25	209.55	762.00	827.02	857.25	28	47.75	996.95	11.18
32	1149.4	98.55	100.08	222.25	812.80	881.13	914.40	28	50.80	1054.1	11.18
34	120.50	101.60	104.65	231.65	863.60	936.75	965.20	28	50.80	1104.9	12.70
36	1270.0	104.65	111.25	241.30	914.40	990.60	1022.4	32	53.85	1168.4	12.70
38	1168.4	107.95	107.95	180.85	965.20	993.65	1028.7	32	41.15	1092.2	12.70
40	1238.3	114.30	114.30	193.55	1016.0	1047.8	1085.9	32	44.45	1155.7	12.70
42	1289.1	119.13	119.13	200.15	1066.8	1098.6	1163.7	32	44.45	1206.6	12.70
44	1352.6	123.95	123.95	206.25	1117.6	1149.4	1193.8	32	47.75	1263.7	12.70
46	1416.1	128.52	128.52	215.90	1168.4	1203.5	1244.0	28	50.80	1320.8	12.70
48	1466.9	133.35	133.35	223.77	1219.2	1254.3	1301.8	32	50.80	1371.6	12.70

ASME B 16.47 Series A flanges (> NPS 26) are MSS SP-44 flanges. MSS SP-44 also covers NPS 12 to NPS 24 flanges which are equivalent to ASME B 16.5. MSS SP-44 is the only source for the NPS 22 flange dimensions above. Dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter. Flat face flanges may be provided at full thickness, C, or with raised face removed (the latter is nonstandard). WNF =Weld Neck Flange. The large end of the hub may be straight or tapered.



WELDING NECK ORIFICE FLANGES CLASS 300. ASME B 16.36



Nominal Pipe Size NPS	Outside Diameter Flange	Thickness of Flange	Diameter of Raised Face	Diameter of Hub at Base	Diameter of Hub at Point Of Welding	Length thru Hub	Diameter of Pressure Connection	No. Of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Diameter of Bolts Circle
	O	C	R	X	A	Y	TT				
1	124.0	38.1	50.8	53.8	33.5	82.6	6.4	4	17.5	15.9	88.9
1 1/2	155.4	38.1	73.2	69.9	48.3	85.9	6.4	4	20.6	19.1	114.3
2	165.1	38.1	91.9	84.1	60.5	85.9	6.4	8	17.5	15.9	127.0
2 1/2	190.5	38.1	104.6	100.1	73.2	88.9	6.4	8	20.6	19.1	149.4
3	209.6	38.1	127.0	117.3	88.9	88.9	9.5	8	20.6	19.1	168.1
4	254.0	38.1	157.2	146.1	114.3	91.9	12.7	8	20.6	19.1	200.2
6	317.5	38.1	215.9	206.2	168.4	100.1	12.7	12	22.4	19.1	269.7
8	381.0	41.1	269.7	260.4	219.2	111.3	12.7	12	25.4	22.2	330.0
10	444.5	47.8	323.9	320.5	273.1	117.3	12.7	16	28.4	25.4	387.4
12	520.7	50.8	381.0	374.7	323.9	130.0	12.7	16	31.8	28.6	450.9

WELDING NECK ORIFICE FLANGES CLASS 600. ASME B 16.36

Nominal Pipe Size NPS	Outside Diameter Flange	Thickness of Flange	Diameter of Raised Face	Diameter of Hub at Base	Diameter of Hub at Point Of Welding	Length thru Hub	Diameter of Pressure Connection	No. Of Bolt Holes	Diameter of Bolt Holes		Diameter of Bolts	Diameter of Bolt Circle	Groove No	Pitch Diameter P	Groove Depth E	Groove Width F	Radius at Bottom max	Specia Oval R H. W
	O	C	R	X	A	Y	TT		R.F	R.J								
1	124.0	36.57	50.8	53.8	33.5	81.02	6.4	4	17.5	19.1	15.9	88.9	R16	50.80	6.35	8.738	0.8	25.4
1 1/2	155.4	36.57	73.2	69.9	48.3	84.32	6.4	4	20.6	22.4	19.1	114.3	R20	68.275	6.350	8.738	0.8	25.4
2	165.1	36.57	91.9	84.1	60.5	84.32	6.4	8	17.5	19.1	15.9	127.0	R23	82.550	7.925	11.913	0.8	26.9
2 1/2	190.5	36.57	104.6	100.1	73.2	87.37	6.4	8	20.6	22.4	19.1	149.4	R26	101.60	7.925	11.913	0.8	26.9
3	209.6	36.57	127.0	117.3	88.9	87.37	9.5	8	20.6	22.4	19.1	168.1	R31	123.825	7.925	11.913	0.8	26.9
4	273.1	38.1	157.2	152.4	114.3	101.6	12.7	8	25.4	25.4	22.2	215.90	R37	149.225	7.925	11.913	0.8	26.9
6	355.6	47.8	215.9	222.3	168.4	117.3	12.7	12	28.4	28.4	25.4	292.10	R45	211.125	7.925	11.913	0.8	26.9
8	419.1	55.6	269.7	273.1	219.2	133.4	12.7	12	31.8	31.8	28.6	349.25	R49	269.875	7.925	11.913	0.8	26.9
10	508.0	63.5	323.9	342.9	273.1	152.4	12.7	16	35.1	35.1	31.8	431.8	R53	323.850	7.925	11.913	0.8	26.9
12	558.8	66.5	381.0	400.1	323.9	155.4	12.7	20	35.1	35.1	31.8	488.95	R57	381.000	7.925	11.913	0.8	26.9

NOTE :
Other NPT Size May Be Furnished If Required. The Length Of The Stud Bolt Does Not Include The Height Of The Chamfers (points)
Bolt Lengths For Raised Face Flanges Include Allowance For Orifice And Gasket Thickness Of 6 MM (0.25 In) For NPS 1 To NPS 12.bolt
Bore (B) is To Be Specified By The Purchaser
TOLERANCES : On All Dimension Shall Be S Shown In ASME B 16.5 Except For Those Shown Below
All Dimension are in millimeters



SUMMARY OF THE ASTM STANDARDS GENERALLY USED FOR SHEETS / PLATES

ASTM	Grade	Chemical requirements percent (%)											Mechanical requirements					
		C max	Mn max	P max	S max	Si max	Ni	Cr.	Mo	Cu	Others	Tensile Strength mini-MPa	Yield Strength mini-MPa	Elong mini %	Brinell	Hardness Rockwell		
	304	0.08	2.00	0.045	0.030	0.75	8.00-10.5	18.00-20.0					515	205	40	201	92	
	304L	0.03	2.00	0.045	0.030	0.75	8.00-12.0	18.00-20.0					485	170	40	201	92	
	310	0.08	2.00	0.045	0.030	1.50	19.0-22.0	24.0-26.0					515	205	40	217	95	
A240	316	0.08	2.00	0.045	0.030	0.75	10.0-14.0	16.0-18.0	2.00-3.00				515	205	40	217	95	
	316L	0.03	2.00	0.045	0.030	0.75	10.0-14.0	16.0-18.0	2.00-3.00				485	170	40	217	95	
	317L	0.03	2.00	0.045	0.030	0.75	11.0-15.0	18.0-20.0	3.00-4.00				515	205	40	217	95	
	321	0.08	2.00	0.045	0.030	0.75	9.00-12.0	17.0-19.0					515	205	40	217	95	
	347	0.08	2.00	0.045	0.030	0.75	9.00-13.0	17.0-19.0					515	205	40	201	92	
	2	0.05-0.21	0.55-0.80	0.035	0.040	0.15-0.40		0.50-0.80	0.45-0.60				Class 1 Class 2					
	5	0.15	0.30-0.60	0.04	0.030	0.050		4.00-6.00	0.45-0.65				380 486	230 310	22	max201HB	max92HRB	
	7	0.15	0.30-0.60	0.030	0.030	1.00		6.00-8.00	0.45-0.65				415 515	205 310	18	max202HB	max92HRB	
A 387 Class1	9	0.15	0.30-0.60	0.030	0.030	1.00		8.00-10.0	0.90-1.10				415 515	205 310	18	max217HB	max95HRB	
Class2	11	0.04-0.17	0.40-0.65	0.035	0.04	0.50-0.80		1.00-1.50	0.45-0.65				415 515	240 310	22	max217HB	max95HRB	
	12	0.04-0.17	0.40-0.65	0.035	0.04	0.15-0.40		0.80-1.15	0.45-0.60				380 450	230 275	22	max217HB	max95HRB	
	21	0.04-0.17	0.30-0.60	0.035	0.035	0.50		2.75-3.25	0.90-1.10				415 515	205 310	18	max201HB	max92HRB	
	22	0.05-0.17	0.30-0.60	0.035	0.035	0.50		2.00-2.50	0.90-1.10				415 515	205 310	18	max201HB	max92HRB	
	55	0.22	0.90	0.035	0.04	0.15-0.40							380-515	205	27			
A 515	60	0.27	0.90	0.035	0.04	0.15-0.40							415-550	220	25			
	65	0.31	0.90	0.035	0.04	0.15-0.40							450-585	240	23			
	70	0.33	1.20	0.035	0.04	0.15-0.40							485-620	260	21			
	55	0.20	0.60-1.20	0.035	0.04	0.15-0.40							380-515	205	27			
	60	0.23	0.65-1.20	0.035	0.04	0.15-0.40							415-560	202	25			
	65	0.26	0.65-1.20	0.035	0.04	0.15-0.40							450-585	240	23			
A 516	70	0.28	0.65-1.20	0.035	0.04	0.15-0.40							485-620	260	21			
	Class 1	0.24	0.70-1.35	0.035	0.040	0.15-0.40	0.25 max	0.80 max	0.35 max				485-620	345	22			
A 537	Class 2	0.24	0.70-1.35	0.035	0.040	0.15-0.40	0.25 max	0.80 max	0.35 max				550-690	415	22			

IS-2002-62 STEEL PLATES FOR BOILERS

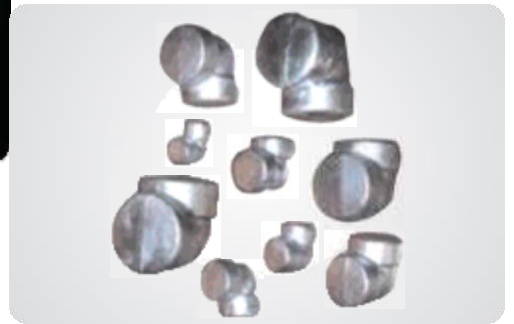
Designation	Chemical Composition					Tensile Test			Elongation	
	C max	Si max	P max	S max		Tensile strength Mpa	Yield Strength Mpa		Test Piece	%min
IS 2002-1		0.10-0.35				362-442			5.650So 4.5So	26 30
IS 2002-2A	0.20	0.10-0.35	0.050	00.50		412-491	491		5.600So 4.5So	25 29
IS 2002-2B		0.10-0.35				510-608			5.650So 4.5So	20 24

IS-2062-92 STEEL FOR GENERAL STRUCTURAL PURPOSES

Grade	Designation	% Chemical Composition				Tensile strength (Min) (N/mm ²)	Yield Strength (Min) Mpa	%E in gauge length 5.650So	Bend Test	Std test Piece energy V Notch Impact Energy Joule min
		C max	MN max	S max	P max					
				0.050				230		
B	FE410 WB	0.22	1.5	0.045	0.40	0.41	41.8	230	250	250
	FE410 WC			0.040	0.40			230		21 for 27 31 for 25mm

Formula - Weight of Stainless Steel Sheets/Plates = Length (mm) x Width (mm) x Thickness (mm) x 7.86 = Kg./Sheet.

FORGED FITTINGS



Stainless Steel: ASTM A182 F304/ 304L/ 304H/ 310S/ 310H/ 316/ 316L/316H/ 317/ 317L/ 321/321H/ 347/ 347H/ 904L etc.

Carbon Steel: ASTM A105 / A694 F42/46/ 52/56/ 60/ 65/70 / A350 LF2.

Alloy Steel: ASTM A182 F1/ F5/ F9/ F11/ F22/ F91 etc.

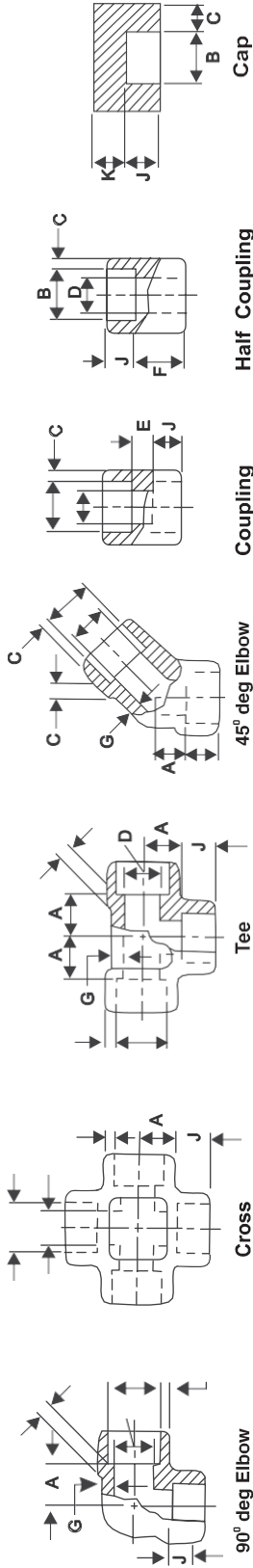
Others: Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead, etc.

Types: Elbow, Tee, Union, Cross, Coupling, Cap, Bushing , Plug, Swage Nipple, Welding Boss, Hexagon Nipple, Barrel Nipple, Welding Nipple, Parraler Nipple, Street Elbow, Hexagon Nut, Hose Nipple, Bend, Adapter, Insert, Weldolet, Elbowlet, Sockolet, Thredolet, Nipolet, Letrolet, etc.

Size: 1/4" NB TO 4" NB. (Socketweld & Threaded)

Class: 3000#, 6000#, 9000#.

DIMENSIONS OF SOCKET-WELDING FITTINGS ANSI B 16.11

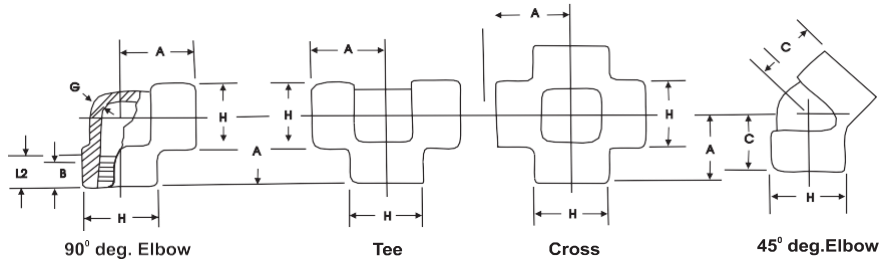


Avg. Min.

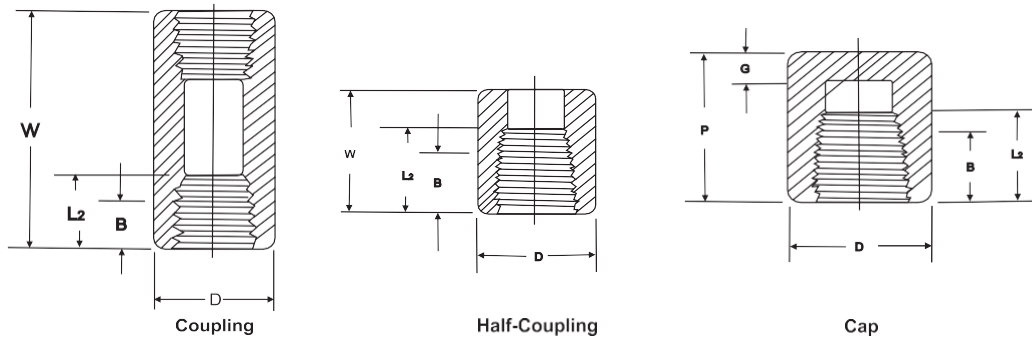
Nominal Pipe Size	Socket Bore Diameter B	Bore Diameter of Fitting D [Note(1)]	Socket Wall Thickness, C [Note (2)]						Body wall G			Min. Depth of Socket J	Center to Bottom of Socket, A				Laying Lengths			Tolerances			End Wall Thickness K Min. Class Designation						
			Class Designation		Class Designation		Class Designation		Class Designation				Class Designation		Class Designation		Class Designation		Class Designation		Class Designation		Class Designation		Class Designation				
			3000	6000	9000	3000	6000	9000	3000	6000	9000		90° Elbows, Tees & Crosses	45° Elbows,		Couplings E	Half Couplings F	A	E	F	3000	6000	9000	3000	6000	9000			
6	1/8	11.2	7.6	4.8	...	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	10.0	7.1	...	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	13.3	9.9	...	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	16.6	12.5	7.2	4.67	4.09	5.97	5.18	9.35	8.18	3.73	4.78	7.47	9.5	15.5	19.5	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	21.7	16.3	11.8	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	27.4	21.5	16.0	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	35.8	30.2	23.5	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	41.6	34.7	28.7	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	53.3	43.6	38.9	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	64.2	...	...	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	79.4	...	...	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	103.8	...	...	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	...
		115.2	100.7	...	...	...	...	...	...	...	...	...	...	...				

(1) All Dimensions Are In Millimeters
 (2) Upper and lower values for each size are the respective maximum and minimum dimensions.
 (3) Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

DIMENSIONS OF THREADED FITTINGS ANSI B 16.11



Nominal Pipe Size		Center to End Elbows, Tees, Crosses A			Center to End 45 Elbows C			Outside Diameter of Bend H			Minimum Wall Thickness G			Min. Length of Thread Note - 1	
NB	INCH	2000	3000	6000	2000	3000	6000	2000	3000	6000	2000	3000	6000	B	L2
6	1/8	21	21	25	17	17	19	22	22	25	3.18	3.18	6.35	6.4	6.7
		21	25	28											
10	3/8	25	28	33	19	22	25	25	33	38	3.18	3.51	6.98	9.1	10.4
		28	33	38											
20	3/4	33	38	44	25	28	33	38	46	56	3.18	4.32	8.53	12.7	13.9
		38	44	51											
32	1 1/4	44	51	60	33	35	43	56	62	75	3.89	5.28	10.59	17.0	18.0
		51	60	64											
50	2	60	64	83	43	44	52	75	84	102	4.27	7.14	12.09	19.0	19.2
		76	83	95											
80	3	86	95	106	64	64	79	109	121	146	5.99	8.84	16.64	25.9	30.5
		106	114	114											

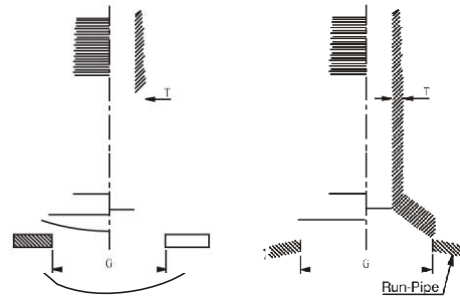


Nominal Pipe Size		End to End Couplings W	End to End Caps P		Outside Diameter D		End Wall Thickness min. G		Min. Length of Thread Note - 1	
	INCH								B	L2
6	1/8	32	19	-	16	22	4.8	-	6.4	6.7
8	1/4	35	25	27	19	25	4.8	6.4	8.1	10.2
10	3/8	38	25	27	22	32	4.8	6.4	9.1	10.4
15	1/2	48	32	33	28	38	6.4	7.9	10.9	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	86	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

FORGED STEEL OUTLET FITTINGS NIPPLE OUTLETS 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		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

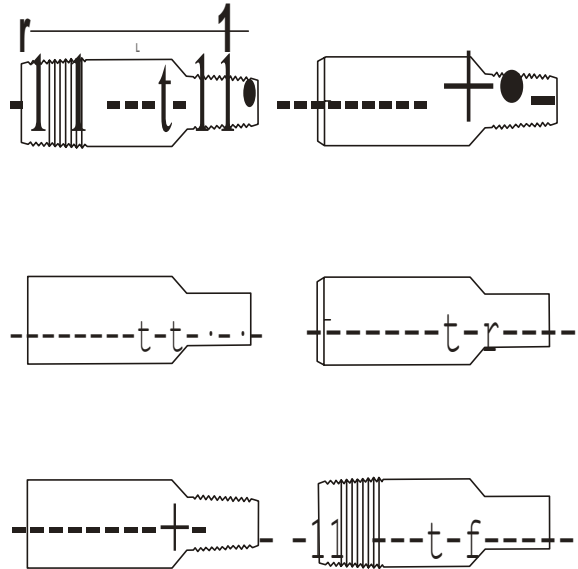


MSS SP- 97

SWAGED NIPPLE

(in millimeters)

Large end Size	Small and Size	Length-L
1/2	3/8-1/8	70
3/4	1/2-1/8	76
	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
 PIE/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



TECHNICAL INFO OF NICKEL BASED ALLOYS

U.S.A. / GROSSBRITANNIE U.S.A. / GRANDE-BRETAGNE U.S.A. / GREAT BRITAN													
Analyses Composition													
Handelsbezeichnung Designation Commercial Commercial designation	C%	Co%	Cr%	Mo%	Ni%	V%	W%	Ai%	Cu%	Nb/Cb Ta%	Ti%	Fe%	Sonstige Autres -Other %
Monel 400	0.12	-	-	-	65.0	-	-	-	32.0	-	-	1.5	Mn 1.
Monel 401	0.10	-	-	-	43.0	-	-	-	53.0	-	-	0.75	Si 0.25; Mn z25
Monel 404	0.15	-	-	-	52.0-57.0	-	-	0.05	rest/bal	-	-	0.50	Mn 0.10; Si 0.10; S o.024
Monel 502	0.10	-	-	-	63.0-17.0	-	-	2,5-3,5	rest/bal	-	0.50	2.0	Mn 1.5; Si:so .010
Monel k 500	0.13	-	-	-	64.0	-	-	2.8	30.0	-	0.6	1.0	Mn 0.8
Monel B	0.10	1.25	0.60	28.0	rest/bal	0.30	-	-	31.0	-	-	1.2	Mn1.0;S0,04
Hastelloy B2	0.02	1.0	1.0	26.0-30.0	rest/bal	-	-	-	-	-	-	2.0	Mn1.0;Si0.10
Hastelloy C	0.07	1.25	16.0	17.0	rest/bal	0.30	40	-	-	-	-	5.75	Mn 1.0;Si 0 0.70
Hadselloy C4	0.015	2.0	14.0-18.0	140-17.0	rest/bal	-	-	-	-	-	0..70	3.0	Mn1.0;Si 00.70
Hastelloy C276	0.02	2.5	140-16.5	15.0-17.0	rest/bal	0.35	3.0-4.5	-	-	-	-	4.0-7.0	Mn 1.0;Si 0.05
Incoloy 800	0.04	-	21.0	-	32.0	-	-	0.3	-	-	0.4	45.0	-
Incoloy 801	0.05	-	20.5	-	32.0	-	-	-	-	-	1.1	45.0	-
Incoloy 802	0.35	-	21.0	-	32.0	-	-	0.6	-	-	0.7	45.0	-
Incoloy 804	0.05	-	29.5	-	41.0	-	-	0.3	-	-	0.6	25.4	-
Incoloy 805	0.12	-	7.5	0.50	36.0	-	-	-	0.10	-	-	rest/bal	Mn 0.60;Si 0.50
Incoloy 810	0.25	-	21.0	-	32.0	-	-	-	0.50	-	-	rest/bal	Mn 0.90; Si 0.80
Incoloy 825	0.04	-	21.0	3.0	42.0	-	-	-	2.0	-	1.0	30.0	-
Incoloy 901	0.05	-	12.5	6.0	rest/bal	-	-	-	-	-	2.9	34.0	Mn 0.24;0.12;00.015
Incoloy 903	0.02	15.0	-	-	38.0	-	-	0.7	-	Nb 3.0	1.4	41.0	-
Incoloy 904	0.02	14.0	-	-	33.0	-	-	-	-	-	1.7	50.0	-
Incoloy 600	0.05	-	15.5	-	75.0	-	-	-	-	-	-	8.0	-
Incoloy 601	0.05	-	23.0	-	60	-	-	1.4	-	-	-	14.0	-
Incoloy 610	0.20	-	15.5	-	rest/bal	-	-	-	0.50	Nb 1.0	-	9.0	Mn0.90;Si 2.0
Incoloy 617	0.07	12.5	22.5	9.0	54.0	-	-	1.0	-	-	-	-	-
Incoloy 625	0.05	-	21.5	9.0	61.0	-	-	0.60	-	Nb 3.65	0.60	2.5	Mn 05;Si 0.50
Incoloy671	0.07	12.5	22.5	9.0	51.0	-	-	-	-	-	0.35	-	-
Incoloy 700	0.12	28.5	15.0	3.75	46.0	-	-	3.0	0.05	-	2.20	0.70	Mn 0.10;Si 0.30
Incoloy 702	0.04	-	15.6	-	rest/bal	-	-	3.4	0.10	-	0.70	0.35	Mn 0.05; Si 0.20
Incoloy 705	0.30	-	15.5	-	rest/bal	-	-	-	0.50	-	-	8.0	Mn 0.90; Si 5.5

Chemical Composition

	Nickel	Chromium	Molybdenum	Copper	Iron	Manganese	Carbon	Silicon	Sulfur
Alloy 020	32.00 - 38.00	19.00 - 21.00	2.00 - 3.00	3.00 - 4.00	Bal.	2.00max	0.07max	1.00max	0.035max

CHEMICAL COMPOSITION OF TITANIUM / NICKEL BASE ALLOYS

Grade	UNS Designation	C % Max	Mn % Max	P % Max	S % Max	Si% -	Ni %	Co %	Cu %	Ag%	Fe %	Pb %	Zn % Max	N %	Ti % Max	H % Max	O %
70/30 Cu-Nu	C 71500	0.05	1.0	0.02	0.02	-	29.0-33.0	-	-	-	0.40-1.0	0.02	0.50	-	-	-	-
90/10 Cu-Ni	C 70600	0.05	1.0	0.02	0.02	-	9.0-11.0	-	-	-	1.0-1.8	0.02	0.50	-	-	-	-
Titanium Gr. 2	R 50400	0.08	0.03	-	-	-	-	-	-	-	0.30	-	-	-	-	-	0.25
Titanium Gr. 1	R 50250	0.08	0.03	-	-	-	-	-	-	-	0.20	-	-	-	-	0.015	0.18
Type 17-4PH	-	0.07	1.00	0.04	0.03	1.00	3.00-5.00	3.00-5.00	0.15-0.45	-	-	-	-	-	-	-	-
Nickel 200	2200	0.15	0.35	-	0.01	0.35	99.0	-	-	-	0.40	-	-	-	-	-	-

Nickel 201	2201	-	0.35	-	0.01	0.35	99.0	-	0.25	-	0.40	-	-	-	-	-	-
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GRF ALLOYS INDUSTRIES
An ISO 9001 : 2015 Certified Co.

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Website: www.grfalloysindustries.com



भारत सरकार
Govt. of India
सूक्ष्म, लघु और मध्यम उद्यम मंत्रालय
MINISTRY OF MICRO, SMALL & MEDIUM ENTERPRISES

MSME
सूक्ष्म, लघु और मध्यम उद्यम
MICRO, SMALL & MEDIUM ENTERPRISES



उद्योग आधार



Udyog Aadhaar



A

Type of Enterprise	Micro	Small	Medium
Manufacturing	A	B	C
Services	D	E	F
UAM No.	MH19A0084850		

Udyog Aadhaar Registration Certificate

Udyog Aadhaar Number: MH19A0084850
Name of Enterprise: GRF ALLOYS INDUSTRIES
Location of Plant Details:

SN	Flat/Door/Block No.	Name of Premises/Building Village	Road/Street/ Lane	Area/Locality	City	Pin	State	District
1	87, 77/89 WAHARI	COMPOUND, 3RD KUMBHARWADA	LANE, GROUND FLOOR	DR. MG MAHIMATURA MARG	MUMBAI	400004	MAHARASHTRA	MUMBAI CITY

Official Address of Enterprise: 87,77/89, WAHARI COMPOUND, 3RD KUMBHARWADA LANE, GROUND FLOOR, DR. M.G. MAHIMATURA MARG, MUMBAI - 400004
District: MUMBAI CITY State: MAHARASHTRA PIN: 400004
Mobile No: 9223333115 Email: grfalloysindustries@gmail.com

Date of commencement: 22/06/2017
Major Activity: MANUFACTURING
Enterprise Type: Micro

Previous Registration details-if any: ::

National Industry Classification Code

SN	NIC 2 Digit	NIC 4 Digit	NIC 5 Digit Code	Activity Type
1	25 - Manufacture of fabricated metal products, except machinery and equipment	2599 - Manufacture of other fabricated metal products n.e.c.	25999 - Manufacture of other fabricated metal products n.e.c.	Manufacturing

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Products
End
Users:**

Petro Chemical Plants
Iron & Steel Plants
Acid & Chemical Factories
Mines
Space Centre
Oil & Gas Industries
Electric Industries
Textile Industries
Food Industries



Cement Plants
Refineries
Power Sectors
Suger Mills
Textile Industries
Ceramic Industries
Ship Building
Offshore Rigs



AN ISO 9001: 2015 CERTIFIED COMPANY

MANUFACTURERS OF : FORGED FLANGE & FITTINGS

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