

VSM

VENUS SPECIAL METALS

AN ISO 9001:2015 CERTIFIED COMPANY

Company Profile

VENUS SPECIAL METALS, an QMS 9001:2015, EMS 14001:2015, OHSAS 45001:2015, PED (Pressure Equipment Directive), CE (Europe) Certified Company, Manufacturing & Supplying the Finest Quality material in Alloy 20, SMO 254, Monel, Inconel, Titanium, Hastelloy, Duplex, Super Duplex, Stainless Steel, Carbon Steel, Alloy Steel etc in the Form of WELDED, SEAMLESS, EFW, HSAW SPIRAL PIPES, TUBES, FITTINGS, FLANGES etc.

Also We do the Fabrication job for our Customers such as TUBE SHELL HEAT EXCHANGER, RING PUDDLE PIPE, AIR DRYER, TANKS and Customized job as per Drawing and Customer requirement.

Immediate Response, Excellent Quality, Quick Delivery and Customer Satisfaction truly define VENUS SPECIAL METALS We also manufacture and specialized in BUTTWELD FITTINGS, FORGED FITTINGS & FLANGES from 15 NB to 3000 NB in Nickel, Monel, Inconel, Incoloy, Hastalloy, Alloy 20, Duplex, Super Duplex with EN 10204 3.1/3.2 MATERIAL TEST CERTIFICATE & TPI Inspection. supplying to various core industries like Refineries & Petrochemicals, Oil & Gas, Chemicals & Fertilisers, Cement, Engineering, Construction, sugar, Nuclear & Thermal, Paper & Pulp.

We have been known for producing our quality products and excellent services, for more about us please visit our website www.venuspecialmetals.com

Quality Assurance

Every manufacturing phase is carried out with modern technique and is under the surveillance of our quality team that ensures all our products meet the national / international standards.

“NO COMPROMISE IN QUALITY” IS OUR MOTTO

Thus, main goal of VSM is high quality products. We have adopted quality analyst personnel to ensure complete satisfaction to our clients. As there is always a scope of betterment we are continually improving upon quality of products.

We have a stringent parameters set for the quality which are followed by all our employees. They see to it that the products are in accordance with the national / international standards.

From the time of procurement of raw material till the final delivery of the products, at every stage, our products are checked for various chemical and mechanical properties using the equipment certified by the Government and its agencies.



Pipes & Tubes



Round Pipes & Tubes



Section Tubes



Corrugated Tubes



'U' Tubes



BIG Size EFW Pipes



Carbon Steel Pipes



Nickel Alloy Pipes



Alloy Steel Pipes

Seamless Pipes & Tubes Size	: 1/8" NB to 24" NB, Sch 10 to Sch XXS, 1/4" OD to 8" OD
Welded Pipes & Tubes Size	: 1/8" NB to 82" NB, Sch 5 to Sch XXS, 1/4" OD to 8" OD
Type	: Round, Square, Rectangle, Hydraulic, Honed Tubes
Form	: SEAMLESS / FABRICATED / WELDED
Length	: Up to 15 meters, custom cut lengths
Stainless Steel Pipes & Tubes	: ASTM A312, A358, A269, A213, A270, A249 GR. TP 304, 304L, 304H, 310S, 310H, 316, 316TI, 316L, 316H, 316LN, 317, 317L, 321, 347, 904L.
Alloy Steel Pipes & Tubes	: ASTM/ASME A335 GR P1, P5, P9, P11, P12, P22, P23, P91
Carbon Steel Pipes & Tubes	: ASTM / ASME A53 GR.A & B, ASTM A106 GR A, B & C. API 5L GR B, API 5L X42, X46, X56, X60, X65 & X70, A333 Gr6
Duplex & Super Duplex Steel Pipes & Tubes	: ASTM A790 / ASME SA790 UNS S32205, S31803, S32750, S32760
Nickel Alloy	: Nickel, Monel, Inconel, Hastelloy, Titanium, Cupro-Nickel, Alloy 20, Incoloy, Copper, Brass, Tantalum, Aluminium, Zinc, Lead, etc.
Copper Alloy Pipes & Tubes	: ASME SB 466 UNS NO. C70600 (CU -NI- 90/10), C71500 (CU -NI- 70/30)

Pipe Fittings & Tube Fittings



ButtWeld Fittings



Forged Fittings



Tube Fittings



Radius Bend



Carbon Steel Fittings



Nickel Alloy Fittings



Mitre Bend



Valves

Seamless Size	: 1/8" NB to 24" NB, Sch 10 to Sch XXS, 1/4" OD to 8" OD
Welded Size	: 1/8" NB to 82" NB, Sch 5 to Sch XXS, 1/4" OD to 8" OD
Forged Fittings Size	: 1/8" NB to 4" NB, 1000#, 2000#, 3000#, 6000#, 9000#
Type	: Tee, Elbow, Reducing Tee, Coupling, Long & Short Stub Band, Reducer, Return Bends, Plug & Union, Cap, Collar, Cross, Mitre Bend Insert etc.
Form	: SEAMLESS / FABRICATED / WELDED / FORGED
Stainless Steel Pipes & Tubes	: ASTM A403, A182 GR. WP 304, 304L, 304H, 310S, 310H, 316, 316TI, 316L, 316H, 316LN, 317, 317L, 321, 347, 904L.
Alloy Steel Pipes & Tubes	: ASTM/ASME A335 GR P1, P5, P9, P11, P12, P22, P23, P91
Carbon Steel Pipes & Tubes	: ASTM A234 WPB / ASTM A105 /A420 WPL3/A420 WPL6/ MSS-SP-75 WPHY 42/46/52/56/60/65/70
Duplex & Super Duplex Steel Pipes & Tubes	: ASTM A182 / ASME SA 182 F 44, F 45, F51, F 53, F 55, F 60, F 61, S32205, S31803, S32750, S32760
Nickel Alloy	: Nickel, Monel, Inconel, Hastelloy, Titanium, Cupro-Nickel, Alloy 20, Incoloy, Copper, Brass, Tantalum, Aluminium, Zinc, Lead, etc.

Flanges



FLANGES



Groove Flange



SORF Flange



Nickel Alloy BLRF



Carbon Steel WNRF



Heavy WNRF Flange



Spectacle Blind



Big Size Flange

Sizes	: 1/8" NB to 72" NB
Class	: 150#, 300#, 400#, 600#, 900#, 1500#, 2500#, 3000#. Also as per the National, International Standard & Customer requirement.
Type	: Weld neck Flanges, Slip-on Flanges, Blind Flanges, Lap Joint Flanges, Socket-weld Flanges, Screwed Flanges, Long weld neck Flanges, Spectacle Blind Flanges, Spacer & Blind Flanges, Ring Type Joint Flanges, Reducing Flanges, Raised Face Flanges, Orifice Flanges, Deck Flange, Large Diameter Flanges, Custom Flanges, Drawing Flanges, Forged Flanges, Plate Flanges, Flat Face Flanges, etc.
Stainless Steel Pipes & Tubes	: ASTM A182, A240 GR. TP 304, 304L, 304H, 310S, 310H, 316, 316TI, 316L, 316H, 316LN, 317, 317L, 321, 347, 904L.
Alloy Steel Pipes & Tubes	: ASTM A182 F1, F5, F9, F11, F12, F22, F91
Carbon Steel Pipes & Tubes	: ASTM A105/A105N, A350 LF1, LF2, CL1/CL2, LF3, CL1/CL2, A694 F42, F46, F48, F50, F52, F56, F60, F65, F70
Duplex & Super Duplex Steel Pipes & Tubes	: ASTM / ASME A/SA 182 F 44, F 45, F51, F 53, F 55, F 60, F 61, S32205, S31803, S32750, S32760
Nickel Alloy	: Nickel, Monel, Inconel, Hastelloy, Titanium, Cupro-Nickel, Alloy 20, Incoloy, Copper, Brass, Tantalum, Aluminium, Zinc, Lead, etc.

Fabricated Pipe & Fabrication Job



Sizes : 1/8" NB to 110" NB, Thickness 0.80 mm to 50 MM THK

Length : Up to 30 meters, custom cut lengths

Grades : SMO 254, Monel, Inconel, Titanium, Duplex Super Duplex, Hastelloy, Alloy 20, Stainless Steel, Carbon Steel, Alloy Steel etc

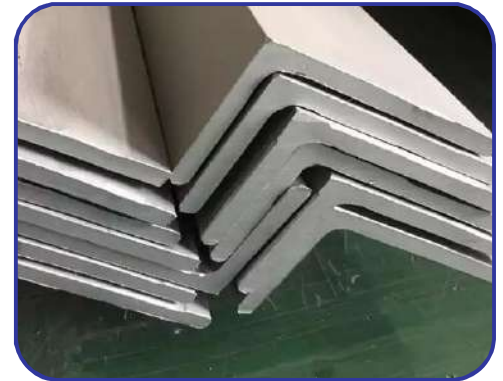
FABRICATION JOBS CAN BE DONE AS PER CUSTOMER DRAWING & SPECIAL REQUIREMENT ALSO.

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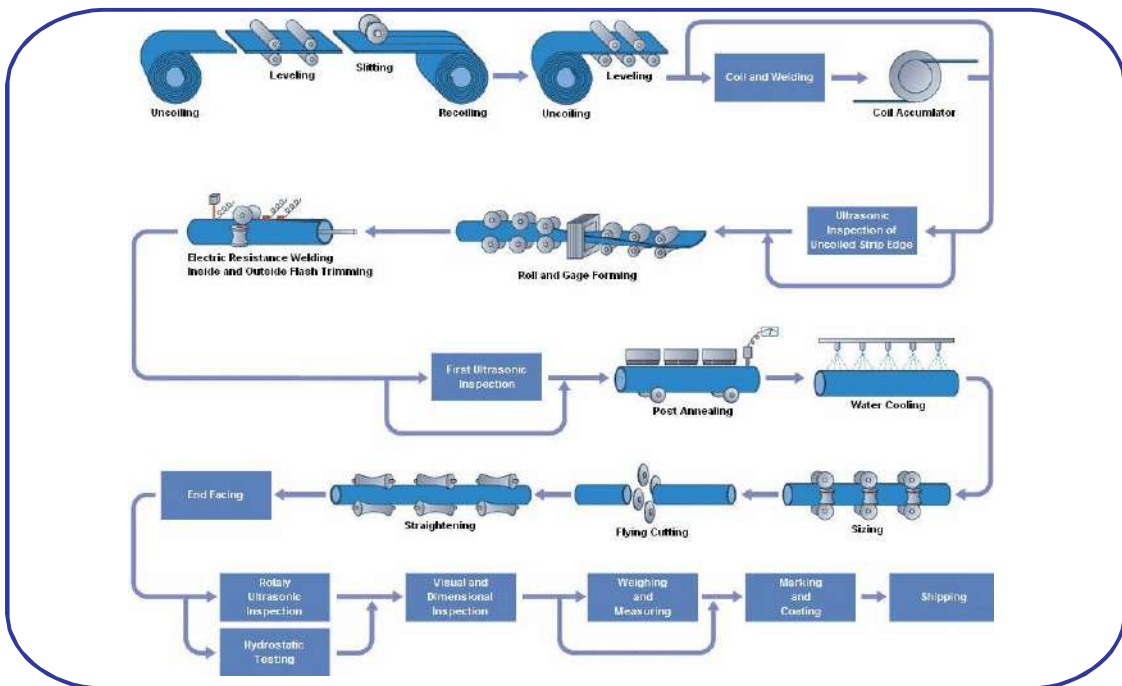
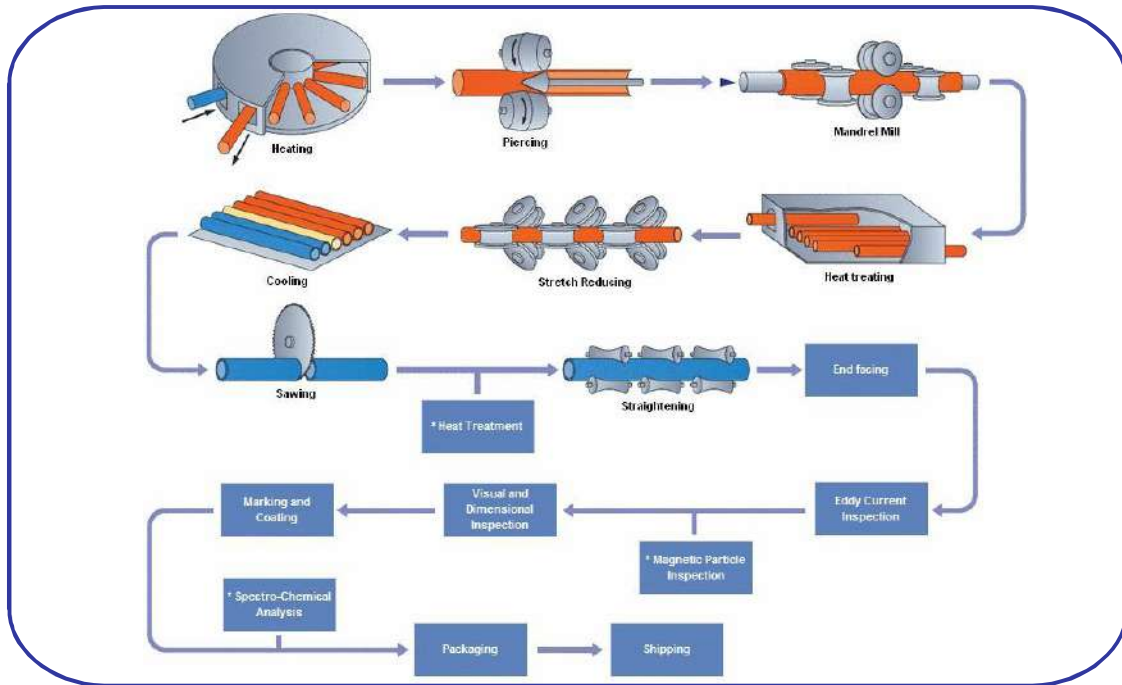
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Other Products



Manufacturing Process Pipes & Tubes



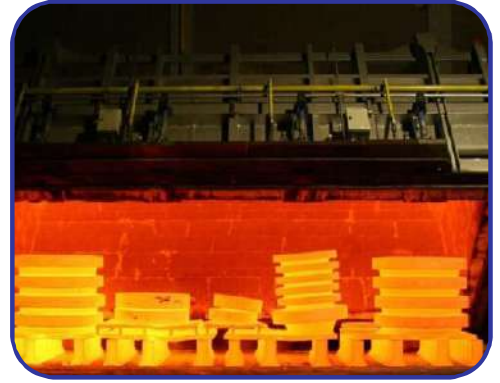
Manufacturing Process Flanges & Fittings



Forging Rolling



Flange Forging



Heat Treatment



Rust Prevention for CS Flanges



Final Inspection



Packing and Shipment



Butt-Welding

To manufacture wrought fittings various methods are used, these are the some types of Hot forming and cold forming processes:

- Hot forming or Extrusion Method
- Hydraulic Bulge method – Cold forming
- UO or Single weld seam Method
- Monaka or Double weld seam Method
- Deep Drawing Method for caps
- Flare Method for Stub ends



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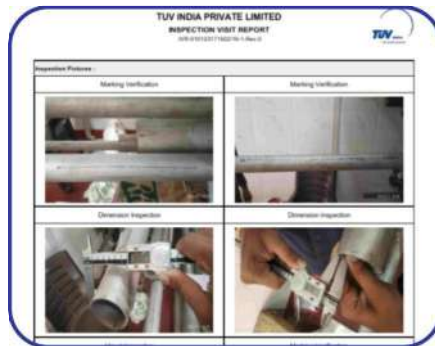
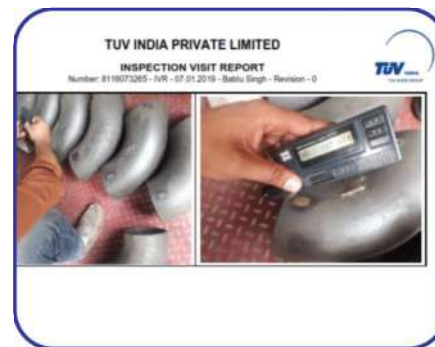


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Inspection



Third Party Inspection & Worldwide Sources for other Products





VENUS SPECIAL METALS

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STAINLESS STEEL PIPE DIMENSION & WEIGHT-KG. PER MTR. (ANSI B36.19)

Nominal Bore		Outside Diameter	Schedule 5S		Schedule 10S		Schedule 40S		Schedule 80S		Schedule 160S		Schedule XXS	
mm	INCH	mm	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)
3	1/8	10.3	1.24	0.276	1.24	0.28	1.73	0.37	2.41	0.47	-	-	-	-
6	1/4	13.7	1.24	0.390	1.65	0.49	2.24	0.631	3.02	0.80	-	-	-	-
10	3/8	17.1	1.24	0.490	1.65	0.63	2.31	0.845	3.20	1.10	-	-	-	-
15	1/2	21.3	1.65	0.800	2.11	1.00	2.77	1.27	3.75	1.62	4.75	1.94	7.47	2.55
20	3/4	26.7	1.65	1.03	2.11	1.28	2.87	1.68	3.91	2.20	5.54	2.89	7.82	3.63
25	1	33.4	1.65	1.30	2.77	2.09	3.38	2.50	4.55	3.24	6.35	4.24	9.09	5.45
32	1 1/4	42.2	1.65	1.65	2.77	2.70	3.56	3.38	4.85	4.47	6.35	5.61	9.70	7.77
40	1 1/2	48.3	1.65	1.91	2.77	3.11	3.68	4.05	5.08	5.41	7.14	7.25	10.16	9.54
50	2	60.3	1.65	2.40	2.77	3.93	3.91	5.44	5.54	7.48	8.74	11.1	11.07	13.44
65	2 1/2	73.0	2.11	3.69	3.05	5.26	5.16	8.63	7.01	11.4	9.53	14.9	14.2	20.39
80	3	88.9	2.11	4.51	3.05	6.45	5.49	11.30	7.62	15.2	11.1	21.3	15.24	27.65
100	4	114.3	2.11	5.84	3.05	8.36	6.02	16.07	8.56	22.3	13.49	33.54	17.12	41.03
125	5	141.3	2.77	9.47	3.40	11.57	6.55	21.8	9.53	31.97	15.88	49.11	19.05	57.43
150	6	168.3	2.77	11.32	3.40	13.84	7.11	28.3	10.97	42.7	18.2	67.56	21.95	79.22
200	8	219.1	2.77	14.79	3.76	19.96	8.18	42.6	12.7	64.6	23.0	111.2	22.23	107.8
250	10	273.1	3.40	22.63	4.19	27.78	9.27	60.5	12.7	96.0	28.6	172.4	25.40	155.15
300	12	323.9	3.96	31.25	4.57	36.00	9.52	73.88	12.7	132.0	33.32	238.76	25.40	186.97
350	14	355.6	3.96	34.36	4.78	41.3	11.13	94.59	19.05	158.08	35.71	281.70	-	-
400	16	406.4	4.19	41.56	4.78	47.29	12.7	123.30	21.41	203.33	40.46	365.11	-	-
450	18	457.2	4.19	46.80	4.78	53.42	14.27	155.80	23.8	254.36	45.71	466.40	-	-
500	20	508.0	4.78	59.25	5.54	68.71	15.09	183.42	26.19	311.2	49.99	564.68	-	-
600	24	609.6	5.54	82.47	6.35	94.45	17.48	255.41	30.96	442.08	59.54	808.22	-	-

CARBON STEEL SEAMLESS PIPE DIMENSION & WEIGHT - KG. PER MTR. (ANSI B 36.10)

Nominal Pipe size	O/D	Schedule 10		Schedule 20		Schedule 30		Schedule STD		Schedule 40		Schedule 60		Schedule Extra Strong (XS)		Schedule 80		Schedule 100		Schedule 120		Schedule 140		Schedule 160		Schedule Double Extra Strong (XXS)			
		mm	kg/m	mm	kg/m	mm	kg/m	wall	wt.	wall	wt.	wall	wt.	wall	wt.	wall	wt.	wall	wt.	wall	wt.	wall	wt.	wall	wt.	wall	wt.	wall	wt.
3	1/8	10.3						1.73	0.37	1.73	0.37			2.41	0.47	2.41	0.47												
6	1/4	13.7						2.24	0.63	2.24	0.63			3.02	0.80	3.02	0.80												
10	3/8	17.1						2.31	0.84	2.31	0.84			3.20	1.10	3.20	1.10												
15	1/2	21.3						2.77	1.27	2.77	1.27			3.73	1.62	3.73	1.62									4.78	1.95	7.5	2.55
20	3/4	26.7						2.87	1.69	2.87	1.69			3.91	2.20	3.91	2.20									5.6	2.90	7.82	3.63
25	1	33.4						3.38	2.50	3.38	2.50			4.55	3.24	4.55	3.24									6.35	4.24	9.1	5.45
32	1 1/4	42.2						3.56	3.39	3.56	3.39			4.85	4.47	4.85	4.47									6.35	5.61	9.7	7.77
40	1 1/2	48.3						3.68	4.05	3.68	4.05			5.08	5.41	5.08	5.41									7.14	7.25	10.2	9.56
50	2	60.3						3.91	5.44	3.91	5.44			5.54	7.48	5.54	7.48									8.74	11.11	11.07	13.4
65	2 1/2	73.0						5.16	8.63	5.16	8.63			7.01	11.41	7.01	11.41									9.53	14.92	14.0	20.4
80	3	88.9						5.49	11.3	5.49	11.3			7.62	15.27	7.62	15.3									11.13	21.35	15.24	27.7
90	3 1/2	101.6						5.74	13.57	5.74	13.57			8.08	18.63	8.08	18.63									-	-	16.2	34.1
100	4	114.3						6.02	16.07	6.02	16.07			8.56	22.3	8.56	22.3				11.13	28.32			13.5	33.5	17.12	41.03	
125	5	141.3						6.55	21.77	6.55	21.77			9.53	30.9	9.53	30.9				12.7	40.2			15.9	49.11	19.0	57.4	
150	6	168.3						7.11	28.26	7.11	28.26			10.97	42.5	10.97	42.5				14.3	54.2			18.3	67.5	21.95	79.22	
200	8	219.1		6.35	33.3	7.0	36.8	8.18	42.5	8.18	42.55	10.31	53.10	12.7	64.6	12.7	64.5	15.1	75.92	18.3	90.4	20.6	100.9	23.0	111.27	22.23	108.0		
250	10	273.0		6.35	41.7	7.8	51.3	9.27	60.3	9.27	60.31	12.70	81.50	12.7	81.5	15.1	96.0	18.3	114.7	21.44	133.0	25.4	155	28.6	172.3	25.4	155.0		
300	12	323.9		6.35	49.7	8.4	65.2	9.53	73.8	10.31	79.73	14.30	109.0	12.7	97.4	17.5	132.0	21.4	160.0	25.4	187.0	28.6	208	33.3	238.7	25.4	187.0		
350	14	355.6	6.35	54.6	7.92	67.9	9.53	81.3	9.53	81.3	11.13	94.55	15.10	126.4	12.7	107.4	19.0	158.0	23.8	195.0	27.8	224.0	31.8	253.5	35.7	281.7			
400	16	406.4	6.35	62.6	7.92	77.9	9.53	93.3	9.53	93.3	12.7	123.3	16.70	160.0	12.7	123.3	21.44	203.5	26.2	245.5	30.9	286.6	36.53	333	40.5	365.4			
450	18	457.0	6.35	70.5	7.92	87.7	11.13	122.4	9.53	105.0	14.27	156.0	19.05	206.0	12.7	139.0	23.8	254.6	29.36	309.6	34.9	363.6	39.7	408.3	45.2	459.4			
500	20	508.0	6.35	78.5	9.53	117.2	12.7	155.1	9.53	117.2	15.09	183.4	20.62	248.5	12.7	155.1	26.2	311.2	32.54	381.5	38.1	441.5	44.4	508	50.0	564.8			
550	22	559.0	6.35	86.5	9.53	129.0	12.7	171.0	9.53	129.0			22.20	294.0	12.7	171.0	28.6	373.8	34.9	451.4	41.3	527.0	47.6	600	54.0	672.0			
600	24	610.0	6.35	94.5	9.53	141.0	14.3	209.7	9.53	141.0	17.48	255.4	24.61	355.0	12.7	187.0	30.96	442.08	38.89	547.7	46.0	640.0	52.4	720.15	59.5	808.22			
650	26	660.0	7.92	127.0	12.7	203.0			9.53	153.0					12.7	202.7													
700	28	711.0	7.92	137.4	12.7	218.7	15.88	271.2	9.53	165.0					12.7	218.7													
750	30	762.0	7.92	147.3	12.7	234.6	15.88	292.18	9.53	176.8					12.7	234.7													
800	32	813.0	7.92	157.0	12.7	250.6	15.88	312.0	9.53	188.2	17.48	342.9			12.7	250.6													
850	34	864.0	7.92	167.0	12.7	266.6	15.88	332.1	9.53	200.3	17.48	364.9			12.7	266.6													
900	36	914.4	7.92	176.9	12.7	282.3	15.88	351.7	9.53	212.5	19.05	420.4			12.7	282.2													

A 106 Gr B

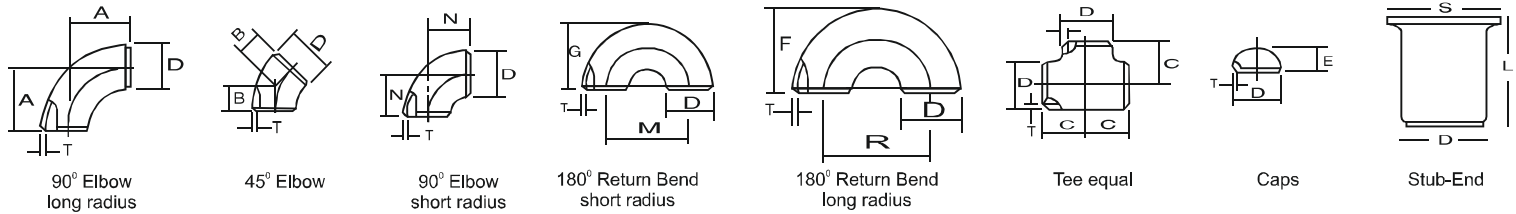
API - 5L - Gr B

A 333 Gr 6

MONEL HASTELLOY & INCOLOY CHEMICAL COMPOSITION

Designation Comercial	C%	Co%	Cr%	Mo%	Ni%	V%	W%	Al%	Cu%	Nb/Cb Ta%	Ti%	Fe%	Sonstige Autres-Other%
Monel 400	0.12	-	-	-	65	-	-	-	32	-	-	1.5	Mn 1.0
Monel 401	0.1	-	-	-	43	-	-	-	53	-	-	0.75	Si 0.25; Mn 2.25
Monel 404	0.15	-	-	-	52.0-57.0	-	-	0.05	rest/bal	-	-	0.5	Mn 0.10; Si 0.10; S 0.024
Monel 502	0.1	-	-	-	63.0-17.0	-	-	2.5-3.5	rest/bal	-	0.5	2	Mn 1.5; Si 0.5; S 0.010
Monel K 500	0.13	-	-	-	64	-	-	2.8	30	-	0.6	1	Mn 0.8
Monel R 405	0.15	-	-	-	66	-	-	-	31	-	-	1.2	Mn 1.0; S 0.04
Hastelloy B	0.1	1.25	0.6	28	rest/bal	0.3	-	-	-	-	-	5.5	Mn 0.80; Si 0.70
Hastelloy B2	0.02	1	1	26.0-30.0	rest/bal	-	-	-	-	-	-	2	Mn 1.0; Si 0.10
Hastelloy C	0.07	1.25	16	17	rest/bal	0.3	40	-	-	-	-	5.75	Mn 1.0 ; Si 0.70
Hastelloy C4	0.015	2	14.0-18.0	14.0-17.0	rest/bal	-	-	-	-	-	0.70	3	Mn 1.0 ; Si 0.08
Hastelloy C 276	0.02	2.5	14.0-16.5	15.0-17.0	rest/bal	0.35	3.0-4.5	-	-	-	-	4.0-7.0	Mn 1.0; Si 0.05
Hastelloy F	0.02	1.25	22	6.5	rest/bal	-	0.5	-	-	Nb2.10	-	21	Mn 1.50; Si 0.50
Hastelloy G	0.05	2.5	21.0-23.5	5.5-7.5	rest/bal	-	1	-	1.5-2.5	Nb1.75-2.5	-	18.0-21.0	Mn 1.0-2.0; p0.04; Si 1.0; B0.03
Hastelloy G-2	0.03	-	23.0-26.0	5.0-7.0	47.0-52.0	-	-	-	0.70-1.20	-	0.70-1.50	rest/bal	Mn 1.0; Si 1.0
Hastelloy N	0.06	0.25	7	16.5	rest/bal	-	0.2	-	0.1	-	-	3	Mn 0.40; Si 0.25; B0.01
Hastelloy S	0.02	2	15.5	14.5	rest/bal	0.6	1	0.2	-	-	-	3	Mn 0.50; Si 0.40; B0.0009; L A 0.02
Hastelloy W	0.06	1.25	5	24.5	rest/bal	-	-	-	-	-	-	5.5	Mn 0.050 ; Si 0.50
Hastelloy X	0.1	1.5	22	9	rest/bal	-	0.6	-	-	-	18.5	-	Mn 0.6; Si 0.60
Incoloy 800	0.04	-	21	-	32	-	-	0.3	-	-	0.4	45	-
Incoloy 800 H	0.08	-	21	-	32	-	-	0.3	-	-	0.4	45	-
Incoloy 801	0.05	-	20.5	-	32	-	-	-	-	-	1.1	45	-
Incoloy 802	0.35	-	21	-	32	-	-	0.6	-	-	0.7	45	-
Incoloy 804	0.05	-	29.5	-	41	-	-	0.3	-	-	0.6	25.4	-
Incoloy 805	0.12	-	7.5	0.5	36	-	-	-	0.1	-	-	rest/bal	Mn 0.60; Si 0.50
Incoloy 810	0.25	-	21	-	32	-	-	-	0.5	-	-	rest/bal	Mn 0.90; Si 0.80
Incoloy 825	0.04	-	21	3	42	-	-	-	2	-	1	30	-
Incoloy 825 Cp	0.04	-	21.5	3	42	-	-	-	2.2	Nb0.9	-	30	-
Incoloy 840	0.08	-	20	-	20	-	-	-	-	-	-	rest/bal	Mn 1.0; Si 1.0
Incoloy 901	0.05	-	12.5	6	rest/bal	-	-	0.15	-	-	2.7	34	Mn 0.24; Si 0.12; B0.015
Incoloy 901 Mod	0.05	-	12.5	5.8	rest/bal	-	-	-	-	-	2.9	34	Mn 0.09; Si 0.08; B0.015
Incoloy 903	0.02	15	-	-	38	-	-	0.7	-	Nb 3.0	1.4	41	-
Incoloy 904	0.02	14	-	-	33	-	-	-	-	-	1.7	50	-
Incoloy DS	0.06	-	18	-	37	-	-	-	-	-	-	42	Mn 1.0; Si 2.3
Incoloy Ma 956	-	-	20	-	-	-	-	4.5	-	-	0.5	74.4	Y2.03 0.5
Incoloy 600	0.05	-	15.5	-	75	-	-	-	-	-	-	8	-
Incoloy 601	0.05	-	23	-	60	-	-	1.4	-	-	-	14	-
Incoloy 604	0.04	-	15.8	-	rest/bal	-	-	-	0.1	Nb 2.0	-	7.2	Mn 0.20; Si 0.20
Incoloy 610	0.2	-	15.5	-	rest/bal	-	-	-	0.5	Nb 1.0	-	9	Mn 0.90; Si 2.0
Incoloy 617	0.07	12.5	22.5	9	54	-	-	1	-	-	-	-	-
Incoloy 625	0.05	-	21.5	9	61	-	-	0.4	-	Nb 3.65	0.4	2.5	Mn 0.50; Si 0.50
Incoloy 671	0.05	-	48	-	51	-	-	-	-	-	0.35	-	-
Incoloy 700	0.12	28.5	15	3.75	46	-	-	3	0.05	-	2.2	0.7	Mn 0.10; Si 0.30
	0.04	-	15.6	-	rest/bal	-	-	3.4	0.1	-	0.7	0.35	Mn 0.05; Si 0.20
									0.5			8	Mn 0.90 ; Si 5.5

BUTT WELDING PIPE FITTINGS DIMENSIONAL STANDARD (ANSI B-16.9 / 16.28 / MSS SP-43)



Nominal Pipe Size		Outside Diameter	Center to Face				Back to Face			Center to Center			Length 'L'	
Inch.	mm	D	A	B	C	N	E	F	G	R	M	S	MSS SP43	ANSI B 16.9
1/2	15	21.3	38	16	25	—	25	48	—	76	—	34.9	50.8	76.2
3/4	20	26.7	29	11	29	—	25	43	—	57	—	42.8	50.8	76.2
1	25	33.4	38	22	38	25	38	56	41	76	51	50.8	50.8	101.6
1 1/4	32	42.2	48	25	48	32	38	70	52	95	64	63.5	50.8	101.6
1 1/2	40	48.3	57	29	57	38	38	83	62	114	76	73	50.8	101.6
2	50	60.3	76	35	64	51	38	106	81	152	102	92	63.5	152.4
2 1/2	65	73	95	44	76	64	38	132	100	191	127	104.8	63.5	152.4
3	80	88.9	114	51	86	76	51	159	121	229	152	127	63.5	152.4
3 1/2	90	101.6	133	57	95	89	64	184	140	267	178	139.7	76.2	152.4
4	100	114.3	152	64	105	102	64	210	159	305	203	157.2	76.2	152.4
5	125	141.3	190	79	124	127	76	262	197	381	254	185.7	76.2	203.2
6	150	168.3	229	95	143	152	89	313	237	457	305	215.9	88.9	203.2
8	200	219.1	305	127	178	203	102	414	313	610	406	270	101.6	203.2
10	250	273.1	381	159	216	254	127	518	391	762	508	324	127.0	254.0
12	300	323.9	457	190	254	305	152	619	467	914	610	381	152.4	254.0
14	350	355.6	533	222	279	356	165	711	533	1067	711	412.8	152.4	305.0
16	400	406.4	610	254	305	406	178	813	610	1219	813	470	152.4	305.0
18	450	457.2	686	286	343	457	203	914	686	1372	914	533.4	152.4	305.0
20	500	508.0	762	318	381	508	229	1016	762	1524	1016	584.2	152.4	305.0
22	550	559.0	838	343	419	559	254	1118	838	1676	1118	614.4	152.4	305.0
24	600	610.0	914	381	432	610	267	1219	914	1829	1219	692.2	152.4	305.0
26	650	660.0	991	406	495	660	267							
28	700	711.0	1067	438	521	711	267							
30	750	762.0	1143	470	559	762	267							
32	800	813.0	1219	502	597	813	267							
34	850	864.0	1295	533	635	864	267							
36	900	914.0	1372	565	673	914	267							
38	950	965.0	1448	600	711	965	305							
40	1000	1016.0	1524	632	749	1016	305							
42	1050	1067.0	1600	660	762	1067	305							
44	1100	1118.0	1676	695	813	1118	343							
46	1150	1168.0	1753	727	851	1168	343							
48	1200	1219.0	1829	759	889	1219	343							



CHEMICAL COMPOSITION OF STAINLESS STEEL

Grade	UNS Designation	Composition %															
		Carbon max	Manganese max	Sulphur max	Phosphorus max	Silicon	Nickel	Chromium	Molybdenum	Titanium	Columbium plus Tantalum	Tantalum max	Nitrogen ^c	Vanadium	Copper	Cerium	Boron
TP304	S30400	0.08	2.00	0.040	0.030	0.75 max	8.00-11.0	18.0-20.0	--	--	--	--	--	--	--	--	--
TP304H	S30409	0.04-0.10	2.00	0.040	0.030	0.75 max	8.00-11.0	18.0-20.0	--	--	--	--	--	--	--	--	--
TP304L	S30403	0.035	2.00	0.040	0.030	0.75 max	8.00-13.0	18.0-20.0	--	--	--	--	--	--	--	--	--
TP304N	S30451	0.08	2.00	0.040	0.030	0.75 max	8.00-11.0	18.0-20.0	--	--	--	0.10-0.16	--	--	--	--	--
TP304LN	S30453	0.035	2.00	0.040	0.030	0.75 max	8.00-11.0	18.0-20.0	--	--	--	0.10-0.18	--	--	--	--	--
TP309Cb	S30940	0.08	2.00	0.045	0.030	0.75 max	12.0-16.0	22.0-24.0	0.75 max	--	10 x C min 1.10 max	--	--	--	--	--	--
TP309H	S30909	0.04-0.10	2.00	0.040	0.030	0.75 max	12.0-15.0	22.0-24.0	--	--	--	--	--	--	--	--	--
TP309Hcb	S3041	0.04-0.10	2.00	0.045	0.030	0.75 max	12.0-16.0	22.0-24.0	0.75 max	--	10 x C min 1.10 max	--	--	--	--	--	--
TP309S	S30908	0.08	2.00	0.045	0.030	0.75 max	12.0-15.0	22.0-24.0	0.75 max	--	--	--	--	--	--	--	--
TP310Cb	S31040	0.08	2.00	0.045	0.030	0.75 max	19.0-22.0	24.0-26.0	0.75 max	--	10 x C min 1.10 max	--	--	--	--	--	--
TP310H	S31009	0.04-0.10	2.00	0.040	0.030	0.75 max	19.0-22.0	24.0-26.0	--	--	--	--	--	--	--	--	--
TP310Hcb	S31041	0.04-0.10	2.00	0.045	0.030	0.75 max	19.0-22.0	24.0-26.0	0.75 max	--	10 x C min 1.10 max	--	--	--	--	--	--
TP310S	S31008	0.08	2.00	0.045	0.030	0.75 max	19.0-22.0	24.0-26.0	0.75 max	--	--	--	--	--	--	--	--
	S31272	0.08-0.12	1.5 2.00	0.030	0.015	0.3-0.7	14.0-16.0	14.0-16.0	1.0-1.4	0.3-0.6	--	--	--	--	--	--	0.04 0.00
TP316	S31600	0.08	2.00	0.040	0.030	0.75 max	11.0-14.0	16.0-18.0	2.00-3.00	--	--	--	--	--	--	--	--
TP316H	S31609	0.04-0.10	2.00	0.040	0.030	0.75 max	11.0-14.0	16.0-18.0	2.00-3.00	--	--	--	--	--	--	--	--
TP316L	S31603	0.035	2.00	0.040	0.030	0.75 max	10.0-15.0	16.0-18.0	2.00-3.00	--	--	--	--	--	--	--	--
TP316N	S31651	0.08	2.00	0.040	0.030	0.75 max	11.0-14.0	16.0-18.0	2.00-3.00	--	--	0.10-0.16	--	--	--	--	--
TP316LN	S31653	0.035	2.00	0.040	0.030	0.75 max	11.0-14.0	16.0-18.0	2.00-3.00	--	--	0.10-0.18	--	--	--	--	--
TP317	S31700	0.08	2.00	0.040	0.030	0.75 max	11.0-14.0	18.0-20.0	3.00-4.00	--	--	--	--	--	--	--	--
TP317L	S31703	0.035	2.00	0.040	0.030	0.75 max	11.0-15.0	18.0-20.0	3.00-4.00	--	--	--	--	--	--	--	--
TP321	S32100	0.08	2.00	0.040	0.030	0.75 max	9.00-13.0	17.0-20.0	--	F	--	--	--	--	--	--	--
TP321H	S32109	0.04-0.10	2.00	0.040	0.030	0.75 max	9.00-13.0	17.0-20.0	--	G	--	--	--	--	--	--	--
TP347	S34700	0.08	2.00	0.040	0.030	0.75 max	9.00-13.0	17.0-20.0	--	H	--	--	--	--	--	--	--
TP347H	S34709	0.04-0.10	2.00	0.040	0.030	0.75 max	9.00-13.0	17.0-20.0	--	I	--	--	--	--	--	--	--
TP347LN	S34751	0.005-0.020	2.00	0.040	0.030	0.75 max	9.00-13.0	17.0-20.0	--	--	0.2-0.5 ^H	--	0.06-0.10	--	--	--	--
TP348	S34800	0.08	2.00	0.040	0.030	0.75 max	9.00-13.0	17.0-20.0	--	--	H	0.10	--	--	--	--	--
TP348H	S34809	0.04-0.10	2.00	0.040	0.030	0.75 max	9.00-13.0	17.0-20.0	--	--	I	0.10	--	--	--	--	--
TPXM 10	S21900	0.08-8.00	8.00-10.00	0.040	0.030	1.00 max	5.50-7.50	19.0-21.5	--	--	--	--	0.15-0.40	--	--	--	--
TPXM 11	S21904	0.04-10.00	8.00-10.00	0.040	0.030	1.00 max	5.50-7.50	19.0-21.5	--	--	--	--	0.15-0.40	--	--	--	--
TPXM-15	S38100	0.08	2.00	0.030	0.030	1.50-2.50	17.5-18.5	17.0-19.0	--	--	--	--	--	--	--	--	--
TPXM-19	S20910	0.060	4.00-6.00	0.040	0.030	1.00 max	11.5-13.5	20.5-3.00	1.50-3.00	--	0.10-0.30	--	0.20-0.40	0.10-0.30	--	--	--
TPXM-29	S24000	0.080	11.5-14.5	0.060	0.030	1.00 max	2.25-3.75	17.0-19.0	--	--	--	--	0.20-0.40	--	--	--	--
---	S31254	0.020	1.00	0.030	0.010	0.80 max	17.5-18.5	19.5-20.5	6.00-6.50	--	--	--	0.18-0.22	--	0.50-1.00	--	--
---	S30615	0.16-0.24	2.00	0.030	0.030	3.2-4.0	13.5-16.0	17.0-19.5	--	--	--	--	--	--	--	--	--
---	S30815	0.05-0.10	0.80	0.040	0.030	1.40-2.00	10.0-12.0	20.0-22.0	--	--	--	--	0.14-0.20	--	--	0.03-0.08	--
---	S31050	0.025	2.00	0.020	0.015	0.4	20.5-23.5	24.0-26.0	1.6-2.6	--	--	--	0.09-0.15	--	--	--	--
---	S30600	0.018	2.00	0.020	0.020	3.7-4.3	14.0-15.5	17.0-18.5	0.20 max	--	--	--	--	--	0.50 max	--	--
---	S31725	0.03	2.00	0.040	0.030	0.75	13.5-17.5	18.0-20.0	4.0-5.0	--	--	--	0.10 max	--	0.75 max	--	--
---	S31726	0.03	2.00	0.040	0.030	0.75	13.5-17.5	17.0-20.0	4.0-5.0	--	--	--	0.10-0.20	--	0.75 max	--	--
---	S32615	0.07	2.00	0.045	0.030	4.8-6.0	19.0-22.0	16.5-19.5	0.3-1.5	--	--	--	--	--	1.5-2.5	--	--
---	S33228	0.04-0.08	1.00	0.020	0.015	0.30 max	31.0-33.0	26.0-28.0	--	--	0.6-1.0	--	--	--	--	0.05-0.10	--
---	S24565	0.03	5.0-7.0	0.030	0.010	1.00 max	16.0-18.0	23.0-25.0	4.0-5.0	--	0.1 max	--	0.04-0.6	--	--	0.03-	--
---	S30415	0.4-0.06	0.80	0.045	0.030	1.00-2.00	9.00-10.0	18.0-19.0	--	--	--	--	0.12-0.16	--	--	0.03-0.08	--
---	S32654	0.020	2.00-4.00	0.030	0.005	0.50 max	21.0-23.0	24.0-25.0	7.00-8.00	--	--	--	0.45-0.55	--	0.030-0.60	--	--
---	S35315	0.04-0.08	2.00	0.045	0.030	0.75	34.0-36.0	24.0-26.0	--	--	--	--	0.12-0.18	--	--	0.03-0.08	--
---	N08367	0.030	2.00	0.030	0.030	1.00 max	23.50-25.50	20.00-22.00	6.00-7.00	--	--	--	0.18-0.25	--	0.75 max	--	--

New designation established in accordance with Practice E 527 and SAE J 1086.

Maximum, unless otherwise indicated. The method of analysis for nitrogen shall be a matter of agreement between the purchaser and manufacturer.

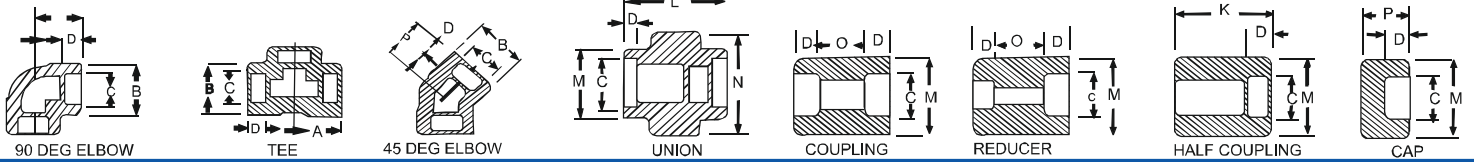
For welded TP316, TP316N, TP316LN, and TP316H pipe, the nickel range shall be 10.0-14.0%. For small diameter or thin walls or both, where many drawing passes are required, a carbon maximum of 0.040% is necessary in grades TP304L and TP316L. Small diameter tubes are defined as those less than 0.500 in (12.7mm) in outside diameter and light wall tubes as those less than 0.049 in (1.20 mm) in average wall thickness (1.10 mm) in minimum wall thickness.

The titanium content shall be not less than five times the carbon content and not more than 0.70%. The titanium content shall be not less than four times the carbon content and not more than 0.60%. The Columbium plus titanium content shall be not less than ten times carbon content and not more than 1.00%.

The Columbium plus titanium content shall be not less than eight times carbon content and not more than 1.00%.

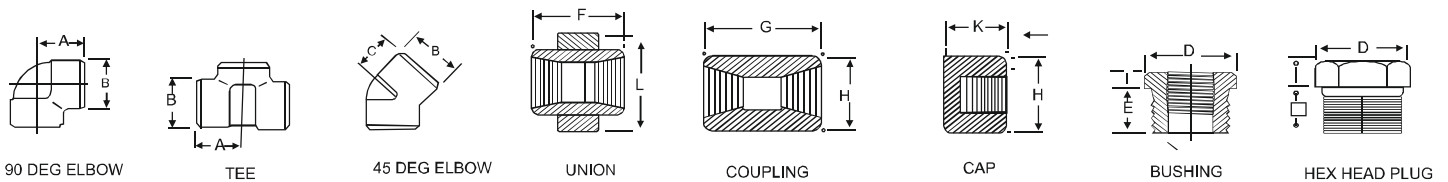
For welded pipe, the phosphorus maximum shall be 0.045%. Grade S34751 shall have a columbium (Niobium) plus tantalum content of not less than 15 times the carbon content.

SOCKET WELD FITTING TO ANSI B-16.11



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

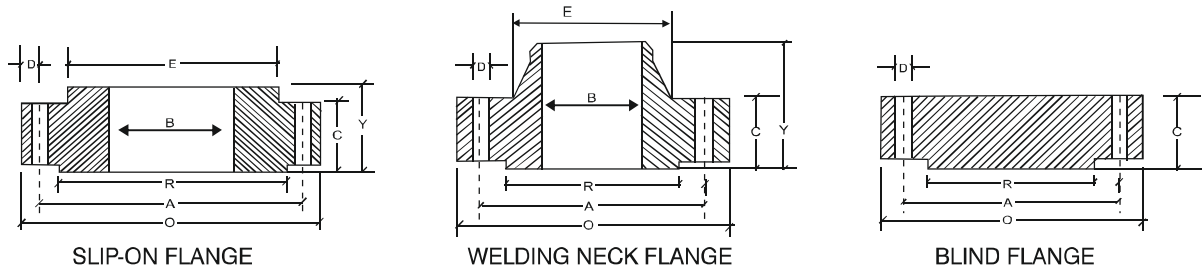
FORGED SCREWED FITTING TO ANSI B-16.11 3000/6000 LBS. THREADED TO ASA B 2.1



NOM BORE	PIPE O.D.	3000 L.B.S.						COMMON FACTORS						6000 L.B.S.					
		A	B	C	G	H	K	D	E	F	I	J	L	A	B	C	G	H	K
1/8"	10.3	21	22	17	32	16	19	11	10	40	-	6	-	25	25	19	32	22	-
1/4"	13.7	25	25	19	35	19	25	16	11	43	3	6	32	29	33	22	35	25	27
3/8"	17.2	29	33	22	38	22	25	17.5	13	48	4	8	38	33	38	25	38	32	27
1/2"	21.3	33	38	25	48	29	32	22	15	51	5	8	46	38	46	29	48	38	33
3/4"	26.7	38	46	29	51	35	37	27	16	57	6	10	51	44	56	33	51	44	38
1"	33.4	44	56	33	60	44	41	35	19	64	6	10	60	51	62	35	60	57	43
1 1/4"	42.2	51	62	35	67	57	44	44.5	21	70	7	14	72	60	75	43	67	64	46
1 1/2"	48.3	60	75	43	79	64	44	51	21	79	8	16	80	64	84	44	79	76	48
2"	60.3	64	84	45	86	76	48	63.5	22	88	9	17	94	83	102	52	86	92	51
2 1/2"	73.02	83	102	52	92	92	60	76	27	118	10	21	122	95	121	64	92	108	64
3"	89.0	95	121	64	108	108	65	89	29	121	10	65	140	106	146	79	108	127	68
4"	114.5	114	152	79	121	140	68	117.5	32	150	13	25	180	114	152	79	121	159	75

NOTE : DIMENSIONS AND SPECIFICATIONS AS PER CUSTOMERS REQUIREMENTS ARE AVAILABLE ON REQUEST
ALL ABOVE DIMENSIONS ARE IN MM

DIMENSIONS OF FORGED FLANGES ANSI B 16.5



ASA 150 CLASS

Nominal Pipe Size	Flange Dia	Dia of Bolt Circle	Dia of Bolt Holes	No. of Holes	Thk of Flange	Dia of Hub	Lenght 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				
							Y	Y	Y	B	B				
(MM)	(INCH.)	O	A	D	C	E	Y	Y	Y	B	B	R	F	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
20	3/4	98.4	69.8	15.9	4	12.7	38.1	15.9	52.4	15.9	27.7	28.2	42.9	11.1	26.67
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
32	1 1/4	117.5	88.9	15.9	4	15.9	58.7	20.6	57.1	20.6	43.2	43.7	63.5	14.3	42.16
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
50	2	152.4	120.6	19.0	4	19.0	77.8	25.4	63.5	25.4	62.0	62.5	92.1	17.5	60.31
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
80	3	190.5	152.4	19.0	4	23.8	107.9	30.2	69.8	30.2	90.7	91.4	127.0	20.6	88.90
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
125	5	254.0	215.9	22.2	8	23.8	163.5	36.5	88.9	36.5	143.8	144.5	185.7	23.8	141.30
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
200	8	342.9	298.4	22.2	8	28.6	246.1	44.4	101.6	44.4	221.5	222.2	269.9	31.7	219.07
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
300	12	482.6	431.8	25.4	12	31.8	365.1	55.6	114.3	55.6	327.1	328.2	381.0	39.7	323.85
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
400	16	596.9	539.7	28.6	16	36.5	457.2	63.5	127.0	87.3	410.5	411.2	469.9	44.4	406.40
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
500	20	698.5	635.0	31.7	20	42.9	558.8	73.0	144.5	103.2	513.1	514.3	584.2	54.0	508.00
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	Flange Dia	Dia of Bolt Circle	Dia of Bolt Holes	No. of Holes	Thk of Flange	Dia of Hub	Lenght 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				
							Y	Y	Y	B	B				
(MM)	(INCH.)	O	A	D	C	E	Y	Y	Y	B	B	R	F	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
20	3/4	117.5	82.5	19.0	4	15.9	47.6	25.4	57.1	25.4	27.7	28.2	42.9	11.1	26.67
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
32	1 1/4	133.3	98.4	19.0	4	19.0	63.5	27.0	65.1	27.0	43.2	43.7	63.5	14.3	42.16
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
50	2	165.1	127.0	19.0	8	22.2	84.1	33.3	69.8	33.3	62.0	62.5	92.1	17.5	60.31
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
80	3	209.5	168.3	22.2	8	28.6	117.5	42.9	79.4	42.9	90.7	91.4	127.0	20.6	88.90
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
125	5	279.4	234.9	22.2	8	34.9	177.8	50.8	98.4	50.8	143.8	144.5	185.7	-	141.30
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
200	8	381.0	330.2	25.4	12	41.3	260.3	61.9	111.1	61.9	221.5	222.2	269.9	-	219.07
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
300	12	520.7	450.8	31.7	16	50.8	374.6	73.0	130.2	101.6	327.1	328.2	381.0	-	323.85
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
400	16	647.7	571.5	34.9	20	57.2	482.6	82.5	146.0	120.6	410.5	411.2	469.9	-	406.40
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
500	20	774.7	685.8	34.9	24	63.5	587.4	95.2	161.9	139.7	513.1	514.3	584.2	-	508.00
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).

NOTE : FLANGES ARE ALSO AVAILABLE IN 600,900,1500,2500 CLASS ON REQUEST

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

SPECIFICATION (ASTM-2002)	CHEMICAL PROPERTIES						MECHANICAL PROPERTIES						OTHERS
	C%	Mn%	P% (Max)	S% (Max)	Si%	Cr%	Mo%	Ni%	U.T.S. (Min) Mpa	Y.S. (Min) Mpa	ELONG. (Min) L	Hardness (Max) BHN	
STAINLESS STEEL													
A 403 Gr. WP 304	0.080 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 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 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	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	N% = 0.10-0.16	
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	-	
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 316	0.080 Max	2.00 Max	0.045	0.030	1.00 Max	16.0-18.0	2.0-3.0	10.0-14.0	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 316H	0.04-0.10	2.00 Max	0.045	0.030	1.00 Max	16.0-18.0	2.0-3.0	10.0-14.0	515	205	28 20	N% = 0.10-0.16	
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	-	
A 403 Gr. WP 317	0.080 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 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 321	0.080 Max	2.00 Max	0.045	0.030	1.00 Max	17.0-19.0	-	9.0-12.0	515	205	28 20	Ti% = (5XC)-0.70	
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	Ti% = (4XC)-0.70	
A 403 Gr. WP 347	0.080 Max	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	
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% = (8XC)-1.10	
CARBON STEEL													
A 234 Gr. WPB	0.30 Max	0.29-1.06	0.050	0.058	0.10 Min	0.40 Max	0.15 Max	0.40 Max	415-655	240	30 20	197	
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	
LOW TEMPERATURE CARBON STEEL													
A 420 Gr. WPL6	0.30 Max	0.50-1.35	0.035	0.040	0.15-0.40	0.30 Max	0.12 Max	0.40 Max	415-655	240	30 16.5	197	
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	
ALLOY STEEL													
A 234 Gr. WP 1	0.28 Max	0.30-0.90	0.045	0.045	0.10-0.50	-	0.44-0.65	-	380-550	205	30 20	197	
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 9	0.15 Max	0.30-0.60	0.030	0.030	1.00 Max	8.0-10.0	0.90-1.10	-	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 CL2	0.05-0.20	0.30-0.80	0.040	0.040	0.50-1.0	1.0-1.5	0.44-0.65	-	485-655	275	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 CL1	0.05-0.20	0.30-0.80	0.045	0.045	0.60 Max	0.80-1.25	0.44-0.65	-	415-585	220	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 CL1	0.05-0.15	0.30-0.60	0.040	0.040	0.50 Max	1.90-2.60	0.87-1.13	-	415-585	205	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	
A 34 Gr. WP 91	0.08-0.12	0.30-0.60	0.020	0.010	0.20-0.50	8.0-9.5	0.85-1.05	0.40 Max	585-760	415	20 -	248	
Cu% = 0.40 Max, Va% = 0.08 Max, Cr% = 0.02 Max Impact Test = -45°C, J = 17.3-13.6 Ti% = 0.03-0.07, Al% = 0.04 Max													




VSM

VENUS SPECIAL METALS

AN ISO 9001:2015 CERTIFIED COMPANY


Manufacturer, Exporter & Supplier of :
Seamless, Welded & Fabricated Pipes, Tubes, Fittings, Flanges, Ferrule Fittings etc.

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