M P JAIN TUBING SOLUTIONS LLP

AN ISO 9001:2015
ISO 14001:2015
OHSAS 18001:2007
PED APPROVED 97/23/EC

Manufacturer of Butweld Pipe Fittings
Forged Fittings, Flanges & Fasteners
|| Since 1972 ||

PIPING SOLUTIONS – PIPES

INSTRUMENTATION

PIPE FITTINGS

PIPING SOLUTIONS

ADDITIONAL PRODUCTS

Website: www.mpjainco.com exports@mpjainco.com **91-22-23465538 / 22-23460403**

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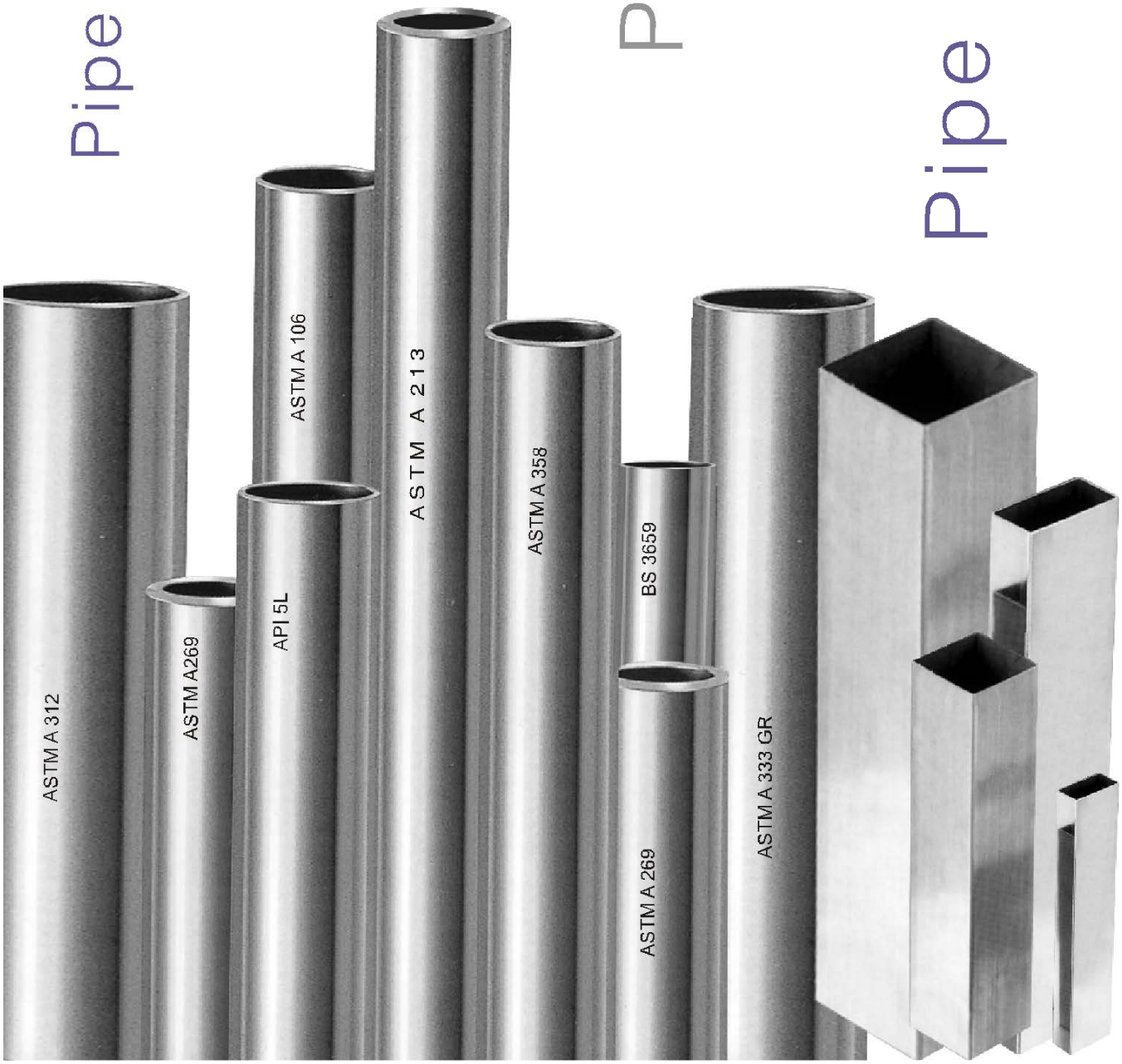

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Pipe Dimension In Accordance To

ANSI B 36 - 10

NOMINAL THICKNESS AND WEIGHTS OF STAINLESS PIPES

Size of Pipe & Tubes		Number of Schedule													
		5S		10		10S		20		30		40		60	
Nominal in inch	Outside in inch	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m
1/8"	10.3	1.0	0.23	1.28	0.28	-	-	1.60	0.345	-	-	1.73	0.36	-	-
1/4"	13.7	1.2	0.37	1.65	0.49	-	-	2.00	0.580	-	-	2.24	0.63	-	-
3/8"	17.1	1.2	0.47	1.65	0.63	-	-	2.00	0.750	-	-	2.31	0.85	-	-
1/2"	21.3	1.65	0.80	2.11	1.00	-	-	2.5	1.15	-	-	2.77	1.26	-	-
3/4"	26.7	1.65	1.03	2.11	1.28	-	-	2.5	1.500	-	-	2.87	1.68	-	-
1"	33.4	1.65	1.29	2.77	2.09	-	-	2.9	2.24	-	-	3.38	2.50	-	-
1 1/4"	42.2	1.65	1.65	2.77	2.73	-	-	3.0	2.910	-	-	3.56	3.38	-	-
1 1/2"	48.3	1.65	1.90	2.77	3.11	-	-	3.0	3.370	-	-	3.68	4.05	-	-
2"	60.3	1.65	2.38	2.77	3.99	-	-	3.0	4.9	-	-	3.91	5.43	-	-
2 1/2"	73.0	2.11	3.70	3.05	5.26	-	-	4.00	6.80	-	-	5.16	8.62	-	-
3"	88.9	2.11	4.50	3.05	6.45	-	-	4.00	8.423	-	-	5.49	11.47	-	-
3 1/2"	101.6	2.11	5.20	3.05	7.41	-	-	4.5	10.500	-	-	5.74	13.78	-	-
4"	114.3	2.11	5.81	3.05	8.50	-	-	4.5	12.255	-	-	6.02	16.32	-	-
5"	141.3	2.77	9.45	3.40	11.74	-	-	5.00	16.900	-	-	6.56	21.80	-	-
6"	168.3	2.77	11.31	3.40	14.04	-	-	6.35	25.500	-	-	7.11	28.69	-	-
8"	219.1	2.77	14.78	3.76	20.27	-	-	6.35	33.28	7.04	37.38	8.18	42.70	10.31	53.07
10"	273.0	3.40	22.62	4.19	27.80	-	-	6.35	42.41	7.80	51.81	9.27	60.30	12.70	82.8
12"	323.9	3.96	31.36	4.57	36.17	-	-	6.35	50.48	8.38	66.20	10.31	79.71	14.27	110.62
14"	355.6	3.96	34.23	4.78	41.60	6.35	55.53	7.92	68.98	9.52	82.58	11.13	95.00	15.09	128.42
16"	406.4	4.19	41.60	4.78	47.60	6.35	63.61	7.92	79.03	9.52	94.20	12.17	125.2	16.66	162.59
18"	457.2	4.19	46.83	4.78	54.15	6.35	71.69	7.92	89.10	11.13	124.32	14.27	158.27	19.05	209.00
20"	508.0	4.78	59.22	5.54	69.70	6.35	79.76	9.52	118.93	12.70	156.04	15.09	185.89	21.62	251.65
22"	558.8	4.78	63.75	5.54	76.76	6.35	87.84	9.52	131.07	12.70	172.04	-	-	22.22	298.55
24"	609.6	5.54	82.60	6.35	95.92	6.35	95.92	9.52	143.20	14.27	211.72	17.48	258.74	24.61	360.21
26"	660.4	-	-	-	-	7.92	129.40	12.70	205.97	-	-	-	-	-	-
28"	711.2	-	-	-	-	7.92	139.47	12.70	222.13	15.88	276.48	-	-	-	-
30"	762.0	-	-	-	-	7.92	148.55	12.70	238.28	15.88	296.68	-	-	-	-
32"	812.8	-	-	-	-	7.92	158.3	12.70	254.44	15.88	316.88	17.48	342.17	-	-
34"	863.6	-	-	-	-	7.92	168.32	12.70	270.50	15.88	336.96	17.48	364.01	-	-
36"	914.4	-	-	-	-	7.92	178.26	12.70	284.75	15.88	357.28	19.05	420.21	-	-

N.B. Thickness and weight "Standard" Extra-Strong and "Double Extra-Strong" within swell elges have a correspondant value in a "Schedule".

For different thickness that suitable the weights can proceed by the following formular $\frac{24.66\ (D-t)\ t}{1000}$

* In accordance to ANSI B 36.19

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Pipe Dimension In Accordance To

ANSI B 36 - 10

NOMINAL THICKNESS AND WEIGHTS OF STAINLESS STEEL PIPES

Number of Schedule															
80		100		120		140		160		Standard		Extra-Strong		Double Extra-Strong	
mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m
2.41	0.46	-	-	-	-	-	-	-	-	1.73	0.36	2.41	0.46	-	-
3.02	0.80	-	-	-	-	-	-	-	-	2.24	0.63	3.02	0.80	-	-
3.20	1.10	-	-	-	-	-	-	-	-	2.31	0.85	3.20	1.10	-	-
3.73	1.62	-	-	-	-	-	-	4.78	1.97	2.77	1.26	3.73	1.62	7.47	2.54
3.91	2.21	-	-	-	-	-	-	5.56	2.93	2.87	1.68	3.91	2.19	7.82	3.63
4.55	3.23	-	-	-	-	-	-	6.35	4.30	3.38	2.50	4.55	3.23	9.09	5.45
4.85	4.50	-	-	-	-	-	-	6.35	5.69	3.56	3.38	4.85	4.46	9.70	7.75
5.08	5.49	-	-	-	-	-	-	7.14	7.35	3.68	4.05	5.08	5.40	10.16	9.54
5.54	7.60	-	-	-	-	-	-	8.74	11.26	3.91	5.43	5.54	7.47	11.07	13.44
7.01	11.59	-	-	-	-	-	-	9.52	15.15	5.16	8.62	7.01	11.40	14.02	20.39
7.62	15.25	-	-	-	-	-	-	11.13	21.67	5.49	11.28	7.62	15.25	15.24	28.11
8.08	18.62	-	-	-	-	-	-	-	-	5.74	13.56	8.08	18.62	-	-
8.56	22.29	-	-	11.13	28.25	-	-	13.49	34.05	6.02	16.06	8.56	22.29	17.12	41.66
9.52	30.92	-	-	12.70	40.24	-	-	15.88	49.87	6.55	21.76	9.52	30.92	19.05	58.31
10.97	43.21	-	-	14.27	54.20	-	-	18.26	68.53	7.11	28.23	10.97	42.52	21.95	79.11
12.70	65.63	15.09	76.93	18.26	90.32	20.62	102.47	23.01	112.97	8.18	42.49	12.70	64.57	22.22	107.78
15.09	97.27	18.26	116.38	21.44	134.90	25.40	157.51	28.58	174.95	9.27	60.24	12.70	81.46	25.40	155.5
17.48	133.88	21.44	162.14	25.40	189.82	28.58	211.31	33.32	242.40	9.52	73.76	12.70	97.36	25.40	189.92
19.05	159.00	23.83	197.74	27.79	227.88	31.75	257.47	35.71	286.04	9.52	81.21	12.70	107.28	-	-
21.44	203.50	26.19	249.34	30.96	290.88	36.53	338.32	40.49	370.74	9.52	93.13	12.70	123.18	-	-
23.83	258.29	29.36	314.54	34.92	369.34	39.67	414.74	45.24	466.67	9.52	105.05	12.70	139.07	-	-
26.19	315.97	32.54	387.41	38.10	448.3	44.45	515.94	50.01	573.31	9.52	116.97	12.70	154.97	-	-
28.58	379.70	34.92	457.83	41.28	535.17	47.62	609.30	53.98	682.57	9.52	128.89	12.70	170.86	-	-
30.96	448.3	38.89	555.76	46.02	649.44	52.37	730.72	59.54	819.70	9.52	140.81	12.70	186.75	-	-
-	-	-	-	-	-	-	-	-	-	9.52	152.73	12.70	202.65	-	-
-	-	-	-	-	-	-	-	-	-	9.52	164.65	12.70	234.44	-	-
-	-	-	-	-	-	-	-	-	-	9.52	176.57	12.70	234.44	-	-
-	-	-	-	-	-	-	-	-	-	9.52	188.50	12.70	250.33	-	-
-	-	-	-	-	-	-	-	-	-	9.52	200.42	12.70	266.22	-	-
-	-	-	-	-	-	-	-	-	-	9.52	212.34	12.70	282.12	-	-

N.B. Thickness and weight "Standard" Extra-Strong and "Double Extra-Strong" within swell elges have a correspondant value in a "Schedule".
For different thickness that suitable the weights can proceed by the following formular $\frac{24.66\ (D-t)\ t}{1000}$

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HIGHLIGHTS OF ASTM SPECIFICATION STAINLESS STEEL TUBES AND PIPES

Specification	Allowable Outside Diameter Variation in mm			Allowable wall Thickness Variation		Exact Length Tolerences in mm		Testing
Specification	**Diameter**	**Over**	**Under**	**Over %**	**Under%**	**Over**	**Under**	**Testing**
ASTM A - 213 Seamless Boiler, Superheater and Heat Exchanger Tubes	Upto 25.4 25.4 - 38.1 incl. 38.1 - 50.8 excl. 50.8 - 63.5 encl. 63.5 - 76.2 excl. 76.2 - 101.6 incl.	0.1016 0.1524 0.2032 0.2540 0.3048 0.3810	0.1016 0.1524 0.2032 0.2540 0.3048 0.3810	+20 +20 +22 +22 +22 +22	-0 -0 -0 -0 -0 -0	3.175 3.175 3.176 3.760 4.760 4.760	0 0 0 0 0 0	Tension Test Flattening Test Hardness test 100% Hydrostatic Test Flare Test Refer to ASTM A-450
ASTM A - 249 Welded Boiler, Superheater, Heat Exchanger and Condenser Tubes	Under 25.4 25.4 -38.1 incl. 38.1 - 50.8 excl. 50.8 - 63.5 excl. 63.5 - 76.2 excl. 76.2 - 101.6 incl.	0.1016 0.1524 0.2032 0.2540 0.3048 0.3810	0.1016 0.1524 0.2032 0.2540 0.3048 0.3810	+10 +10 +10 +10 +10 +10	-10 -10 -10 -10 -10 -10	3.175 3.175 3.175 3.76 4.76 4.76	0 0 0 0 0 0	Tension Test, Fletting test Flare Test * Reverse Bend Test Hardness Test 100% Hydrostatic Test *Reverse Flattering Test Refer to ASTM A-450 Whenever applicable
ASTM A - 269 Seamless & Welded Service	Upto 12.7 12.7 -38.1 excl. 38.1 - 88.9 excl. 88.9 - 139.7 excl. 139.7 - 203.2 excl.	0.13 0.13 0.25 0.38 0.76	0.13 0.13 0.25 0.38 0.76	+15 +10 +10 +10 +10	-15 -10 -10 -10 -10	3.2 3.2 4.8 4.8 4.8	0 0 0 0 0	Tension Test Flange Test (Welded only) Hardness Test Reverse Flatterning test (Welded only) 100% Hydrostatic Test Refer to ASTM A-269
ASTM A - 312 Seamless & Welded Pipes	13.7 - 48.3 incl. 48.3 - 114.3 incl. 114.3 - 220 incl.	0.40 0.79 1.59	0.79 0.79 0.79	Minimum Wall tubes 12.5% under nominal wall Specified		6.4 6.4 6.4 (Normally Random lengths ordered)	0 0 0	Tension Test Fletting Test 100% Hydrostatic Test
ASTM - 270 Seamless & Welded Sanitary Tubes	25.4 38.1 50.8 63.5 76.2 101.6	.05 .05 .05 .05 .08 .08	.20 .20 .28 .28 .30 .38	+12.5 +12.5 +12.5 +12.5 +12.5 +12.5	-12.5 -12.5 -12.5 -12.5 -12.5 -12.5	3.2 3.2 3.2 3.2 3.2 3.2	0 0 0 0 0 0	Reverse Flattering test 100% Hydrostatic test External polish on all tubes Refer to ASTM A-270
ASTM A - 268 Seamless & Welded Femtic Stainless Steel tubes	Upto 12.7 12.7 - 38.1 excl. 38.1 - 88.9 excl. 88.9 - 168.9 excl.	0.13 0.13 0.25 0.38	0.13 0.13 0.25 0.38	+15 +10 +10 +10	-15 -10 -10 -10	3.2 3.2 4.8 4.8	0 0 0 0	Tension Test Flange Test CERW only Hardness Test Reverse Flattering Test 100% Hydrostate Test
ASTM A - 358 For Welded big Diameter Pipes	For all size	+0.5%	0.5%	No Limit	-0.3 mm	Customer's Specification		

SUMMARY OF THE MA|N ASTM STANDARDS GENERALLY USED FOR P|P|NG

ASTM	Grade	Chemical requirement percent (%)										Mechanical requirements			
		C Max	MN max	P max	S max	Si max	Ni	Cr	Mo	Cu	Others	Tensile Strength mini- Mpa	Yeild Strength mini-MPa	Elong. mini %	Impact test at C F
A53	A B	0.25 0.30	0.95 1.20	0.05 0.05	0.06 0.06		0.40max 0.40max	0.40max 0.40max	0.15max 0.15max	0.40max 0.40max	0.08max 0.08max	330 415	205 240	36 29.5	
A106	A B C	0.25 0.30 0.35	0.27-0.93 0.29-1.06 0.29-1.06	0.035 0.035 0.035	0.035 0.035 0.035	0.10min 0.10min 0.10min	0.40max 0.40max 0.40max	0.40max 0.40max 0.40max	0.15max 0.15max 0.15max	0.40max 0.40max 0.40max	0.08max 0.08max 0.08max	330 415 485	205 240 275	L35-T25 L30-T16.5 L30-T16.5	
A312	TP 304 TP 304L TP 310S TP 316 TP316L TP317L TP 321 TP 347	0.08 0.035 0.08 0.08 0.035 0.035 0.08 0.08	2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00	0.040 0.040 0.045 0.040 0.040 0.040 0.040 0.040	0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030	0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75	8.00-11.0 8.00-13.0 19.0-22.0 11.0-14.0 10.0-15.0 11.0-15.0 9.00-13.0 9.00-13.0	18.0-20.0 18.0-20.0 24.0-26.0 16.0-18.0 16.0-18.0 18.0-20.0 17.0-20.0 17.0-20.0	 0.75 max 2.00-3.00 2.00-3.00 3.00-4.00		Ti >5xC< 0.70 Cb + Ta > 10xC < 1.10	515 485 515 515 485 515 515 515	205 170 205 205 170 205 205 205	L35-T25 L35-T25 L35-T25 L35-T25 L35-T25 L35-T25 L35-T25 L35-T25	
A333	3 4 6 7 8 9	0.19 0.12 0.30 0.19 0.13 0.20	0.31-0.64 0.50-1.05 0.29-1.06 0.90 0.90 0.40-1.06	0.025 0.025 0.025 0.025 0.025 0.025	0.025 0.025 0.025 0.025 0.025 0.025	0.18-0.37 0.08-0.37 0.10 min 0.13-0.32 0.13-0.32	3.18-3.82 0.47-0.98 2.03-2.57 8.40-9.60 1.60-2.24	0.44-1.01		0.40-0.75 0.75-1.25	Ai 0.40-0.30	450 415 415 450 690 435	240 240 240 240 515 315	L30-T20 L30-T16.5 L30-T16.5 L30-T22 L22 L28	-100 -150 -100 -150 - 45 - 50 - 75 - 100 -195 -320 - 75 - 100
A335	P1 P2 P5 P9 P11 P12 P15 P21 P22 P91	0.10-0.20 0.10-0.20 0.15 0.15 0.05-0.15 0.05-0.15 0.05-0.15 0.05-0.15 0.05-0.15 0.08-0.12	0.30-0.80 0.30-0.61 0.30-0.60 0.30-0.60 0.30-0.60 0.30-0.61 0.30-0.60 0.30-0.60 0.30-0.60 0.30-0.60	0.025 0.025 0.025 0.025 0.025 0.025 0.025 0.025 0.025 0.025	0.025 0.025 0.025 0.025 0.025 0.025 0.025 0.025 0.025 0.025	0.10-0.05 0.10-0.30 0.50 0.25-1.00 0.50-1.00 0.50 1.15-1.65 0.50 0.50 0.20-0.50	 0.40max	 0.50-0.81 4.00-6.00 8.00-10.0 1.00-1.50 0.80-1.25 - 2.65-3.35 1.90-2.60 8.00-9.50	0.44-0.65 0.44-0.65 0.45-0.65 0.90-1.10 0.44-0.65 0.44-0.65 0.44-0.65 0.80-1.06 0.87-1.13 0.85-1.05		Cb-0.06-0.10, Va 0.18-0.25, N-0.030-0.070 Ai -0.40	380 380 415 415 415 415 415 415 415 585	205 205 205 205 205 220 205 205 205 415	L30-T20 L30-T20 L30-T20 L30-T20 L30-T20 L30-T20 L30-T20 L30-T20 L30-T20 L20	
A358	TP304 TP310 TP316 TP316L TP317L TP321 TP 347	0.08 0.08 0.08 0.08 0.030 0.08 0.08	2.00 2.00 2.00 2.00 2.00 2.00 2.00	0.045 0.045 0.045 0.045 0.045 0.045 0.045	0.030 0.030 0.030 0.030 0.030 0.030 0.030	0.75 0.50 0.75 0.75 0.75 0.75 0.75	8.0-10.50 19.0-22.0 10.0-14.0 10.0-14.0 11.0-15.0 9.0-12.0 9.0-13.0	18.0-20.0 24.0-26.0 16.0-18.0 16.0-18.0 18.0-20.0 17.0-19.0 17.0-19.0	- - 2.0-3.0 2.0-3.0 3.0-4.0 - -		Ti >5xC< 0.70 Cb + Ta > 10xC < 1.10	Class 1 : Double welded pipes & full Radiography Class 2 : Double welded no Radiography Class 3 : Single welded full Radiography Class 4 : Single welded full Radiography root pass without addition of filter Class 5 : Double Welded spot Radiography			

Formula - Sheet Width Required for Rolled & Welded Pipes - O. D. (mm) - Thickness (mm) x 3.14 = Sheet Width.

L-Longitudinal
T- Transverse

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ASTM A479 STAINLESS STEEL ROUND BAR CHEMICAL & PHYSICAL PROPERTIES

ASTM GRADE	C	Mn	Si	S	P	Cr	Ni	Mo	Other	Tensile Psi(MPa)	Yield Psi(MPa)	Elongation Strip/Round	Hardn.	Redu. in Area. (%)
A479 TP 304	0.08 max	2.00 max	1.00 max	0.030 max	0.045 max	18.0 20.0	8.0 10.5	—		75000 (515)	30000 (205)	30	—	40
A479 TP 316	0.08 max	2.00 max	1.00 max	0.030 max	0.045 max	16.0 18.0	10.0 14.0	2.0 3.0		75000 (515)	30000 (250)	30	—	40
A479 TP 317L	0.035 max	2.00 max	1.00 max	0.030 max	0.045 max	18.0 20.0	11.0 15.0	3.0 4.0		75000 (515)	30000 (250)	30	—	40
A479 TP 310	0.08 max	2.00 max	1.00 max	0.030 max	0.045 max	24.0 26.0	19.0 22.0		—	75000 (515)	30000 (205)	30	—	40
A479 TP 347H	0.04 0.10	2.00 max	1.00 max	0.030 max	0.040 max	17.0 19.0	9.0 13.0		Cb-BxC -13.0	75000 (515)	30000 (205)	30	—	40
479 TP 321	0.08	2.00 max	1.00 max	0.030 max	0.045 max	17.0 19.0	9.0 12.0		5(C+N)<Ti <0.70%	75000 (515)	30000 (205)	30	—	40

ASTM A182 ALLOY STEEL ROUND BAR CHEMICAL & PHYSICAL PROPERTIES

ASTM GRADE	C	Mn	Si	S	P	Cr	Ni	Mo	Other	Tensile Psi(MPa)	Yield Psi(MPa)	Elongation Strip/Round	Hardn.	Redu. in Area. (%)
182 F 11 Class 2	0.10 0.20	0.30 0.80	0.50 1.0	0.04 max	0.04 max	1.0 1.50	—	0.44 0.65	—	70000 (45.46)	40000 (27.05)	20	143-207	30
A 182 F22 Class 3	0.05 0.15	0.30 0.60	0.50 max	0.04 max	0.04 max	2.0 2.50	—	0.87 1.13	—	75000 (52.52)	45000 (31.7)	20	156-207	30
A 182 F 5	0.15 max	0.30 0.60	0.50 max	0.03 max	0.03 max	4.0 6.0	0.5 max	0.44 0.65	—	70000 (48.45)	40000 (27.05)	20	143-217	35
A 182 F9	0.15 max	0.30 0.60	0.50 1.00	0.03 max	0.03 max	8.0 10.0	—	0.90 1.10	—	85 (56.65)	55 (380)	20	179-217 (BHN)	40

IS-1875 ASTM A105 CARBON STEEL ROUND BAR CHEMICAL & PHYSICAL PROPERTIES

ASTM GRADE	C	Mn	Si	S	P	Cr	Ni	Mo	Other	Tensile Psi(MPa)	Yield Psi(MPa)	Elongation Strip/Round	Hardn.	Redu. in Area. (%)
A 105	0.35 max	0.60 1.05	0.10/0.35 max	0.040 max	0.035 max	—	—	—	—	70000 (485)	36000 (250)	30-strip 22-Round	187 max	30 Round
A LF2	0.30 max	1.35 max	0.15 0.30	0.040 max	0.035 max	0.30 max	0.40 max	0.12 max	Cu-0.4 max Cb-0.02 max Va-0.3max	70-95 (485-655)	36 (250)	22/30	20/16 (-45.6°)	36

Formula - Weight of stainless steel rounds = Dia. (mm) x Dia (mm) x 0.00623 = Kg Per Mtr.
Weight of Stainless Steel Hexagonal Rods = Dia. (mm) x Dia. (mm) x 0.00679 = Kg Per Mtr.

Weight of Stainless Steel Square Bars = Dia. (mm) x Dia (mm) x 0.00787 = Kg. Per Mtr.
Weight of Stainless Steel Circle & Blanks = O.D. (mm) x O.D.(mm) X Thk (mm)/160/1000 = Kg Per Pcs.

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Manufacturer of Butweld Pipe Fittings
Forged Fittings, Flanges & Fasteners
|| Since 1972 ||

STANDARD TYPES OF STAINLESS STEEL GAUGE PIPE & BARS

WEIGHT & THICKNESS OF S.S. GAUGE PIPE PER FEET

Size	O.D.	10G (3.25)	12G (2.64)	14G (2.03)	16G (1.62)	18G (1.21)
1/4"	6.35	0.075	0.070	0.065	0.058	0.046
5/16"	7.93	0.114	0.105	0.089	0.079	0.060
3/8"	9.52	0.152	0.135	0.113	0.097	0.080
1/2"	12.70	0.226	0.200	0.157	0.134	0.105
3/4"	19.05	0.386	0.326	0.256	0.215	0.161
1"	25.40	0.541	0.450	0.0351	0.294	0.218
1 1/4"	31.82	0.696	0.580	0.448	0.375	0.275
1 1/2"	38.10	0.851	0.700	0.542	0.542	0.322
1 3/4"	44.45	1.020	0.832	0.646	0.530	0.390
2"	50.8	1.161	0.960	1.733	0.607	0.447
2 1/4"	57.15	1.315	1.085	0.828	0.697	0.504
2 1/2"	63.5	1.472	1.210	0.924	0.792	0.562
2 3/4"	69.85	1.630	1.338	1.022	0.847	0.619
3"	76.2	1.782	1.460	1.115	0.924	0.676
3 1/2"	88.9	2.092	1.718	1.306	1.082	0.791
4"	101.6	2.403	1.971	1.497	1.239	0.905
4 1/2"	114.3	2.713	2.224	1.688	1.397	1.020
5"	127.0	3.023	2.477	1.879	1.554	1.134
5 1/2"	139.7	3.336	2.730	2.070	1.713	1.250
6"	152.4	3.654	2.983	2.291	1.875	1.364
6 1/2"	165.1	3.975	3.256	2.452	2.028	1.478

Note : Weight for **** size bar available on bar will go to 34 and upto 150

STANDARD WIRE GAUGE

SEG No.	Dia Inch	Dia MM	SWG No.	Dia Inch	Dia MM
7/0	.500	12.7000	23	.024	0.6096
6/0	.464	11.7856	24	.022	0.5588
5/0	.432	10.9728	25	.020	0.5080
4/0	.400	10.1600	26	.018	0.4572
3/0	.372	9.4488	27	.016	0.4166
2/0	.348	8.8892	28	.0148	0.3759
1/0	.324	8.2296	29	.0136	0.3454
1	.300	7.6200	30	.0214	0.3150
2	.276	7.0104	31	.0116	0.2946
3	.252	6.4008	32	0.108	0.2743
4	.232	5.8928	33	.0100	0.2540
5	.212	5.3848	34	.0092	0.2337
6	.192	4.8766	35	.0084	0.2134
7	.176	4.4704	36	.0076	0.1930
8	.160	4.0640	37	.0068	0.1727
9	.144	3.6576	38	.0060	0.1524
10	.128	3.2512	39	.0052	0.1321
11	.116	2.9464	40	.0048	0.1219
12	.104	2.6416	41	.0044	0.1118
13	.092	2.2368	42	.0040	0.1016
14	.080	2.0320	43	.0036	0.0914
15	.072	1.8288	44	.0032	0.0813
16	.064	1.6256	45	.0028	0.0711
17	.056	1.4224	46	.0024	0.0610
18	.048	1.2192	47	.0020	0.0580
19	.040	1.0160	48	.0016	0.0406
20	.036	0.9144	49	.0012	0.0305
21	.032	0.8128	50	.0010	0.0254
22	.028	0.7112			

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|| Since 1972 ||

MILD STEEL PIPE CONFIRMING TO IS: 1239 (PART 1) 1979

Nominal Bore		Outside Diameter		Light		Medium		Heavy	
				Thickness	Weight	Thickness	Weight	Thickness	Weight
Inch	In mm	In	mm	mm	kg/mtr	mm	Kg/Mtr.	mm	Kg/Mtr.
1/8"	3 mm	0.406	10.32	1.80	0.361	2.00	0.407	2.65	0.493
1/4"	6 mm	0.532	13.49	1.80	0.517	2.35	0.650	2.90	0.769
3/8"	10 mm	0.872	17.10	1.80	0.674	2.35	0.852	2.90	1.02
1/2"	15 mm	0.844	21.43	2.00	0.952	2.65	1.122	3.25	1.45
3/4"	20 mm	1.094	27.20	2.35	1.410	2.65	1.580	3.25	1.90
1"	25 mm	1.312	33.80	2.65	2.010	3.25	2.440	4.05	2.97
1.1/4"	32 mm	1.656	42.90	2.65	2.580	3.25	3.140	4.05	3.84
1.1/2"	40 mm	1.906	48.40	2.90	3.250	3.25	3.610	4.05	4.43
2"	50 mm	2.375	60.30	2.90	4.110	3.65	5.100	4.47	6.17
2.1/2"	65 mm	3.004	76.20	3.25	5.840	3.65	6.610	4.47	7.90
3"	80 mm	3.500	88.90	3.25	6.810	4.05	8.470	4.85	10.1
4"	100 mm	4.500	114.30	3.65	9.890	4.50	12.10	5.40	14.4
5"	125 mm	5.500	139.70	-	-	4.85	16.20	5.40	17.8
6"	150 mm	6.500	165.10	-	-	4.85	19.20	5.40	21.2

BIG DIAMETER ERW PIPES CONFIRMING TO IS 3589

Wall Thickness in mm	Nominal Bore 7" NB 193.7 mm OD	Nominal Bore 8" NB 219.1 mm OD	Nominal Bore 10" NB 273 mm OD	Nominal Bore 12" NB 323.7 mm OD	Nominal Bore 14" NB 355.6 mm OD	Nominal Bore 16" NB 406.4 mm OD	Nominal Bore 18" NB 457 mm OD	Nominal Bore 20" NB 508 mm OD
kg/mtr	kg/mtr	kg/mtr	kg/mtr	kg/mtr	kg/mtr	kg/mtr	kg/mtr	kg/mtr
4.85	22.59	25.62	32.07	38.13	-	-	-	-
5.20	24.17	27.43	34.34	40.85	-	-	-	-
5.60	26.00	29.28	36.93	43.93	48.11	-	-	-
6.00	27.88	31.53	39.50	47.02	51.49	61.00	69.00	-
6.35	29.34	33.28	41.73	49.67	54.43	62.35	70.50	78.50
7.01	32.27	36.76	46.43	55.45	61.82	69.04	-	-
7.94	-	41.00	50.95	61.85	67.98	77.92	87.80	-
8.18	-	42.56	53.42	65.12	-	-	-	-
9.53	-	51.50	60.24	73.75	81.21	93.13	105.00	117.00
12.70	-	-	-	-	107.28	123.30	139.00	155.00

Tolerance on Thickness and Weight : as per IS 1239
The following manufacturing tolerance shall be permitted on the tubes and sockets.

(a) Thickness
(1) Butt welded Light tubes + Not limited - 8 percent
Medium and Heavy tubes + Not Limited - 10 percent
(2) Seamless tubes + Not Limited - 12.5 percent

(b) Weight :
(1) Single tube (light series) + 10 percent - 8 percent
(2) Single tube (medium and heavy series) + 10 percent

MAXIMUM PERMISSIBLE PRESSURE AND TEMPERATURE FOR TUBES WITH STEEL COUPLINGS OR SCREWED AND SOCKETED JOINTS

Nominal Bore mm	Maximum Permissible Presure N/mm²	Kg./cm²	Maximum Permissible Temperature °C
Upto and Including 25 mm	1.20	12.24	260
Over 25 mm upto and Including 40 mm	1.03	10.50	260
Over 40 mm upto and Including 80 mm	0.86	8.77	260
over 80 mm upto and Including 100 mm	0.69	7.04	260
	0.83	8.47	177
Over 100 mm upto and Including 125 mm	0.69	7.04	171
Over 125 mm upto and Inlcuding 150 mm	0.50	5.10	160

For tubes fitted with appropriate fittings of suitably butt welded together, the Max. permissible pressure shall be 21.00 Kg/cm² and Max. permissible temp. 260°C

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Copper & Brass

Our Range of Products

COPPER PRODUCTS
1. Copper Tube for general engineering purpose Mfg. range: O.D. - 3mm to 150mm W.t. - up to any thickness, subject to outside diameter Grade - ETP, DLP, DHP
2. MEX Flow Tube Half Hard Nitrogenised Seamless Copper Tube for Gas and Plumbing application as per BS:EN1057 (BS 2871 Part I Table X) Mfg. range: 6mm to 159 mm outside diameter Grade - DHP
3. Refrigeration Quality Copper Tube Mfg. range : 3/16" & 3/4" diameter upto 27 swg in 15 & 30 mts. coil. Grade - DHP
4. High Conductivity Copper Rods Mfg. range: 6mm to 100mm diameter in straight lengths. Grade - ETP
5. Copper Rods for general engineering purpose / Earth Rods Mfg. range: 6mm to 100mm diameter Earth Rods: 14.2 / 14.8 / 16mm Grade - DHP
6. Copper Bus Bars & Strips / Tapes Mfg. range: 10mm to 20mm diameter in any thickness are manufactured in straight length Coil from and also Tinned Coated Grade - ETP, DHP, ETP+Ag
7. Copper Sheets / Earthing Sheets Mfg. range: 4 x 4 feet, 5mm to 10mm and 8 x4 feet and sizes as per customer's need. Grade - ETP, DHP

INTERNAL FIN TUBES
Specialised in Intergrally Fin-Tubes Internal & External in all types of Copper based alloys. (First complete manufacturer in india)
1. Copper Fin Tubes Mfg. range: 3/4", 5/8" Fin : 19 Fin, 26 Fin. 26 intregues : 40 Fin, Tubro B, F, Tube
COPPER ALLOY PRODUCTS
1. Cupro Nickel Tube : 90/10, 70/30 Mfg. range : O.D. - 3mm to 100mm Up to any thickness, subject to outside diameter
2. Brass Tube 70:30 / 63:37 / 85:15 / Admirality / AL Brass Mfg. range : O.D. - 6mm to 100mm W.T. - Up to any thickness, subject to outside diameter
3. Brass Rod Mfg. range : O.D. - 6mm to 100mm Dia.
4. Brass Flat/ Strips Mfg. range : 10mm to 200mm Dia. in any thickness
5. Brass Sheets Mfg. range : 4 x 4 feet, 5mm to 10mm & 8 x 4 feet & Sizes as per your requirement.
We Undertakes manufacturing of tailor-made Copper-based Alloy Semis, as per the customers' specification and ensure delivery of goods to our client, even at every short notice.

ALUMINIUM ALLOY : CHEMICAL COMPOSITION STD. (Per Cent)

Alloy (ISS) Old	Equivalent alloy (A.A.)		Copper		Magnesium		Silicon		Iron	Manganese		*Other (total)	Remark
	New	U.S.A.	Min.	Max.	Min.	Max.	Min.	Max.					
1B	19500	1050	—	0.05	—	—	—	0.30	0.4	—	0.05	0.1	Aluminium 99.5% Min.
1E	19501	1050(EC)	—	0.04	—	—	—	0.15	0.35	—	—	0.1	Aluminium 99.5% Min.
	19700	1070	—	0.03	—	—	—	0.20	0.25	—	0.03	0.1	Aluminium 99.7% Min.
1A	19800	1080	—	0.03	—	—	—	0.15	0.15	—	0.03	0.1	Aluminium 99.8% Min.
1C	19900	1100	—	0.1	—	0.2	—	0.50	0.7	—	0.1	0.2	Aluminium 99.0% Min.
—	—	2011	5.0	6.0	—	0.1	—	0.4	0.7	—	0.1	0.4	Also lead & bismuth - 0.2 - 0.6% each
H15	24345	2014	3.8	5.0	0.2	0.8	0.5	1.2	0.7	0.3	1.2	0.5	—
H14	24534	2017	3.5	4.7	0.4	1.2	0.2	0.7	0.7	0.4	1.2	0.5	—
N3	31000	3003	—	0.1	—	0.1	—	0.6	0.7	0.8	1.5	0.4	—
N21	43000	4043	—	0.1	—	0.2	4.5	6.0	0.6	—	0.5	0.5	—
N2	46000	4047	—	0.1	—	0.2	10.0	13.0	0.6	—	0.5	0.5	—
N4	52000	5052	—	0.1	1.7	2.6	—	0.6	0.7	—	0.5	0.4	—
N5	53000	5086	—	0.1	2.8	4.0	—	0.6	0.7	—	0.5	0.4	—
N6	55000	5056	—	0.1	4.5	5.0	—	0.6	0.7	—	1.01	0.4	Chromium upto 0.25
N8	54300	5083	—	0.1	4.0	4.9	—	0.4	0.7	0.5	1.0	0.4	Chromium upto 0.25
H20	65032	6061	0.15	0.4	0.8	1.2	0.4	0.8	0.7	0.2	0.8	0.4	Chromium (0.15 - 0.35) Either Mno_2 Cr Shall be present.
H9	63400	6063	—	0.1	0.4	0.9	0.3	0.7	0.6	—	0.3	0.4	Chromium upto 0.10
—	—	6066	0.7	1.2	0.8	1.4	0.9	1.8	0.7	0.6	1.1	0.4	
—	64423	—	0.5	1.0	0.5	1.3	0.7	1.3	0.8	1.0	—	—	
91E	63401	6101	—	0.1	0.35	0.8	0.3	0.7	0.5	—	0.03	0.1	
—	64401	6201	—	0.1	0.6	0.9	0.5	0.9	0.5	—	0.03	0.1	
H30	64430	6351	—	0.1	0.4	1.2	0.6	1.3	0.6	0.4	1.0	0.3	Chromium upto 0.25
—	74530	7039	—	0.2	1.0	1.5	—	0.4	0.7	0.2	0.7	0.4	Zinc (4 - 5%)
—	—	7075	1.20	2.0	2.1	2.9	—	0.4	0.5	—	0.3	0.5	Zinc (5.1 - 6.4) & Chromium (0.1 - 0.25)

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CHEMICAL COMPSITION OF ALLOY STEELS

Steel Type	Quality	AISI	C	Si	Mn	Cr	W	V	Co	Mo	Ni
High Speed Steel	18 % W 18% W + 5 % Co 18% W + 10 % Co 6/5/2	T1 T4 T5 M2	0.75 0.80 0.75 0.80	0.40 0.40 0.40 0.40	0.40 0.40 0.40 0.40	4.30 4.30 4.30 4.30	18.0 18.0 18.0 6.5	1.00 1.60 1.60 2.00	— 5.0 9.5 —	— 0.80 0.80 5.00	— — — —
Hot Work Steel	9 % W 5 % Cr	H21 H11	0.30 0.36	0.20 1.00	0.30 0.40	2.60 5.00	8.5 —	0.40 0.40	— —	— 0.10	— —
Non Shrinking Die Steel	HCHC " OHNS " "	D3 D2 01 02 E0300	2.0 1.70 0.95 0.90 1.00	0.30 0.30 — 0.20 0.40	0.30 0.30 1.00 1.90 1.00	12.00 12.00 0.50 0.30 1.00	— 0.5 0.5 — —	— 0.10 0.10 0.10 0.10	— — — — —	— 0.60 — — 0.10	— — — — —
Pnemumatic Steel		S2	0.48	0.90	0.30	1.10	1.90	0.20	—	—	—
Shock Resisting Steel	V6N		0.90	—	—	—	—	0.20	—	—	0.70
Stainless Steel	Magnetic Non-Magnetic	410 304	0.10 0.08	0.75 1.00	1.00 2.00	13.00 18.00	— —	— —	— —	— —	0.60 10.00
Carbon Tool Steel		1095	0.90	0.20	0.40	—	—	—	—	—	—
Constructional Steel	EN-8	1040	0.35/ 0.45	0.10/ 0.35	0.60/ 0.90	—	S&P	each (MAX)	0.06		
	EN-9	1055	0.45/ 0.60	0.10/ 0.35	0.50/ 0.80	—	S&P	each (MAX)	0.06		
	EN-19	4140	0.35/ 0.45	0.10/ 0.35	0.50/ 0.80	0.90/ 1.50	S&P	each (MAX)	0.05	0.20/ 0.40	
	EN-24	4340	0.35/ 0.45	0.10/ 0.35	0.45/ 0.70	0.90/ 1.40	S&P	each (MAX)	0.05	0.20/ 0.35	1.30/ 1.80
	EN-30 B		0.26/ 0.34	0.10/ 0.35	0.40 0.60	1.10/ 1.40	S&P	each (MAX)	0.05	0.20/ 0.40	3.90/ 4.30
	EN-31	52100	0.95/ 1.20	0.10/ 3.35	0.30 0.75	1.00/ 1.60	S&P	each (MAX)	0.025		
	EN-36	3310	0.15/	0.10/ 0.35	0.30 0.60	0.60/ 1.10	S&P	each (MAX)	0.05		3.00 3.75
Sprining Steel	EN-45 EN-47	9255 6150	0.50/ 0.60 0.45/ 0.55	1.50/ 2.00 0.50	0.70 1.00 0.50 0.80	0.80/ 1.20	S&P	each (MAX)	0.05 S&P	each (MAX)	0.05
Case Hardening Steel	SAE	8620	0.18/ 6.23	0.20 0.35	0.70 0.90	0.40 0.60	S&P	each (MAX)	0.04	0.15/ 0.26	0.40/ 0.70
	16 M/N Cr5 20 M/N Cr5	—	0.14-0.19 0.17-0.22	0.17-0.37 1.17-0.37	1.00-1.30 1.10-1.40	0.80-1.10 1.00-1.30	S&P S&P	—	0.035 0.035	—	---

Notes : O = Oil; CA = Compressed Air; M = Martempring bath; W = Water; A = Wir

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NICKEL BASE ALLOYS

NOMINAL CHEMICAL COMPOSITION, % (not for specification purposes)

Nickel	Nl	C	Mn	Fe	S	Si	Cu	Cr	Co	Mo	Al	Tl	Other
Nickel200	99.2	0.10	0.3	0.4	0.005	0.18	0.10	-	0.25	-	-	-	-
Nickel201	99.0	0.02	0.35	0.4	0.005	0.18	0.25	-	0.25	-	-	-	-
Nickel205	99.6	0.02	0.3	0.2	0.004	0.08	0.05	-	0.1	-	-	0.03 Mg	0.05
Nickel212	97.7	0.010	2.0	0.05	0.005	0.05	0.03	-	-	-	-	-	-
Nickel222	99.5	0.01	0.02	0.04	0.0025	0.01	0.01	0.01	0.06	0.01	0.01	Mg0.08	
Nickel270	99.98	0.01	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	Mg<0.001	
	Ni	C	Mn	Fe	S	Sl	Cu	Cr	Co	Mo	Ai	Ti	Other
K.MONEL alloy 400	63.0 min	0.15	1.25 max	2.5max	0.024max	0.05max	31.0	-	-	-	-	-	-
K.MONEL alloy 500	63.0 min	0.25	1.5 max	2.0max	0.010max	0.5	30.0	-	-	-	2.9	0.6	-
Cast MONEL alloy	63.0 min	0.07	0.75	2.5max	0.02 max	0.04max	30.0	0.10max	-	0.20max	0.05max	0.01max	-
Cast MONEL alloy	63.0 min	0.03max	0.020max	2.5max	0.02max	0.04max	30.0	0.10	-	0.20max	0.05max	0.01max	-
INCONEL alloy 600	72.0 min	0.025 max	1.0 max	8.0	0.05 max	0.05max	0.05 max	14 - 17	-	-	-	-	Nb +
INCONEL alloy 625	Bal	0.025max	0.25	3.0max	0.015max	0.5 max	-	21 - 23	-	8 - 10	0.25	0.25	3.65
INCOLOY alloy 800	32 - 34	0.025max	1.5max	Bal.	0.015max	-	0.75 max	20 - 22	0.5 max	-	0.15 - 0.40	0.35 - 0.60	Al + Ti max. 1.0
INCOLOY alloy 825	38 - 46	0.025max	1.0max	Bal.	0.03 max	0.5max	2.25	19.5 - 23.5	1.5 - 3	2.5 - 3.5	0.20max	0.9	Ti 0.6 - 1.2
INCOLOY alloy 904	32.5	0.025	0.025	Bal.	0.015	0.25	0.25	-	14.5	-	0.1	1.6	-
INCOLOY alloy DS	37.0	0.10 max	0.21 max	Bal.	-	2.3 max	2.3 max	18.0	-	-	-	-	
Hastalloy C22	Bal	0.010 max	-	2 - 6	-	0.08 max.	-	20 - 22.5	2.5 max.	12.5-14.5	2.50	Co	W-2.50 3.50
Hastalloy C-276	Bal	0.010 max	1.00	5.50	-	-	-	15 - 16.5	15 - 16.5	15 - 17	-	-	W-3.75uV.1-0.3 Si-0.02 Co-2.50
Hastalloy C-4	Bal	0.009 max.	1.00	3.00	0.7		-	14.5 17.5	5.575	14.00 17.00	-	0.70	Co-2.00 Si-0.05 P-0.04

PHYSICAL AND MECHANICAL PROPERTIES

	Density Kg/dm3	Melting Range °C	Specefic heat at 20°C J/KgC	Thermal Conductivity at 20°C W/mC	Thermal Expansion 10-6°C 20-95°C	Electrical resistivity at 20°C microohm cm	Tensile strength N/mn²	Hardness HV
Nickel 200	8.89	1435-1445	456	74.9	13.3	9.5	380-550	90-120
Nickel 201	8.89	1435-1445	456	79.2	13.3	7.6	340-410	75-100
Nickel 205	8.89	1435-1445	456	74.9	13.3	9.5	340	77
Nickel 212	8.86	1435-1445	430	44.1	-	10.9	476	144
Nickel 222	8.89	1435-1445	456	74.9	13.3	8.8	340	77
Nickel 270	8.89	1455	460	85.7	13.3	7.5	340	80
Monel alloy 400	8.83	1300-1350	419	21.7	14.1	51.0	480-620	111-151
Monel alloy k-500	8.46	1315-1350	419	17.4	13.7	61.4	620-760	141-189
Inconel alloy 600	8.42	1370-1425	461	14.8	13.3	103	550-690	121-173
Inconel alloy 625	8.44	1290-1350	410	9.8	12.8	129	830-1040	146-247
Incoloy alloy 800	7.95	1355-1385	502	11.7	14.2	99	520-700	121-188
Incoloy alloy 825	8.14	1370-1400	441	10.9	14.0	113	580-730	121-183
Incoloy alloy 904	8.12	-	442	14.9	4.6	72	923	-
Incoloy alloy DS	7.92	1330-1400	452	12.0	14.1	108	680	208