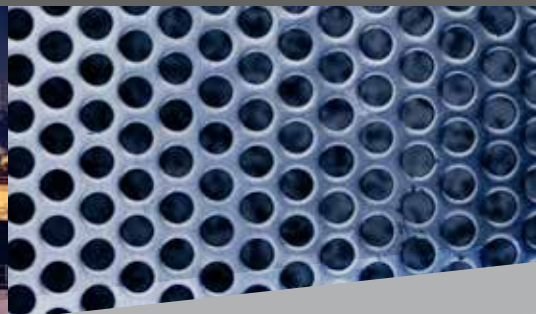
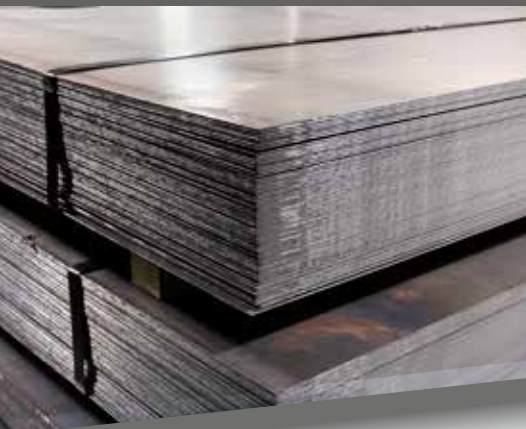




# SHEETS, PLATES & TUBESHEETS





We are on the plate, sheet and tubesheet market since more than 40 years. TPS-Technitube Röhrenwerke GmbH takes up the challenges of the market with competence, experience and uncompromising commitment to quality. Our closest price calculation puts our customers in front of their competition. TPS-Technitube Röhrenwerke GmbH, your flexible partner for sheets, plates and tubesheets for the chemical and petrochemical industry, energy- and offshore technology, paper, pharma and textile industry.

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- Acc. to EN 10204/2.2, EN 10204/3.1 and EN 10204/3.2

**Carbon Steel, Alloy Steel, Stainless Steel, Heat Resistance Steel, Nickel and Nickel Alloys, Titanium and Copper Alloys:**

- ASTM or ASME
- in accordance with DIN 17440 / DIN 17741 or EN 1088-1 / 10088-2
- to SEW 400 respectively SEW 470
- Other international standards

**Our special service:**

- Plasma-arc cutting: underwater / on water or dry
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# CARBON STEEL PLATES FOR BOILER AND PRESSURE VESSELS



## ASTM A 283 Low and Medium Strength Carbon Steel

Code	Chemical Composition (%)*						Tension Test				
	Maximum Available Thickness (mm)	Thickness (mm)	C	Mn	Si	P	S	Min. Yield Strength ksi (Mpa)	Tensile Strength ksi(Mpa) 8"	Min. Elongation (%) GL=200mm   L=50mm 2"	
A 283-A	100	<1 1/2(40)	0.14 max.	0.90 max.	0,40 max	0.035 max.	0.04 max.	24 (165)	45-60 (310-450)	27	30
A 283-B	100	1 1/2(40)kt <1 1/2(40)	0.17 max.	0.90 max.	0.15-0.40 0.40 max	0.035 max.	0.04 max.	27 (185)	50-70 (945-425)	25	28
A 283-C	100	1 1/2(40)kt <1 1/2(40)	0.24 max.	0.90 max.	0.15-0.40 0.40 max	0.035 max.	0.04 max.	30 (205)	55-75 (380-515)	22	25
A 283-D	100	1 1/2(40)kt 1 1/2(40)kt	0.27 max.	0.90 max.	0.15-0.40	0.035 max.	0.04 max.	33 (230)	60-80 (415-550)	20	23

\*) Copper, min % when copper is specified 0.20 (all grades)

## ASTM A 285 Carbon Steel for Pressure Vessels for Low and Intermediate

### Tensile Strength

Classification	Chemical Composition (%)				Tension Test			
	C	Mn*)	P	S	Tensile Strength ksi(Mpa)	Min. Yield Strength ksi(Mpa)	Elongation (Min.)(%) GL=8" (200mm)   GL=2" (50 mm)	
A 285A	0.17 max.	0.90 max.	0.035 max.	0.035 max.	45-65(310-450)	24(165)	27	30
A 285B	0.22 max.	0.90 max.	0.035 max.	0.035 max.	50-70(345-485)	27(185)	25	28
A 285C	0.28 max.	0.90 max.	0.035 max.	0.035 max.	55-75(380-515)	30(205)	23	27

\*) Product analysis (mm) : max 0.98

## ASTM A 516 Carbon Steel for Moderate and Lower Temperature

class	Chemical Composition (%)					Tension Test					
	C					Mn		Tensile Strength ksi(Mpa)	Minimum Yield Strength	Elongation(Min.)(%) GL=8 (200mm)   GL=2 (50mm) ksi(Mpa)	
	1/2" max.	1/2" <t2" max.	2" <t4" max.	4" <t8" max.	>8" max	Thickness in (mm) 1/2"(13) and over 1/2" under	Thickness in (mm)				
A 516-55 (Gr.380)	0.18	0.20	0.22	0.24	0.26	0.60-0.90 (0.55-0.98)	0.60-1.20 (0.65-1.30)	55-75 (380-515)	30(205)	23	27
A 516-60 (Gr.415)	0.21	0.23	0.25	0.27	0.27	0.60-0.90 (0.55-0.98)	0.85-1.20 (0.79-1.30)	60-80 (415-550)	32(220)	21	25
A 516-65 (Gr.450)	0.24	0.26	0.28	0.29	0.29	0.85-1.20 (0.79-1.30)	0.85-1.20 (0.79-1.30)	65-85 (450-585)	35(240)	19	23
A 516-70 (Gr.485)	0.27	0.28	0.30	0.31	0.31	0.85-1.20 (0.79-1.30)	0.85-1.20 (0.79-1.30)	70-90 (485-620)	38(260)	17	21

Si = 0.15-0.40 (all grades)  
(0.13-0.45) Product analysis

P = 0.035 max. (all grades)

S= 0.035 max (all grades)

(...) = Product analysis



# CARBON ANS ALLOY STEEL PLATES FOR BOILER AND PRESSURE VESSELS

## ASTM A 387 Pressure Vessel Plates, Alloy Steel Chromium – Molybdenum

Chemical Composition (%) Product analysis

Tension Test

Chemical Composition	Product analysis							Tensile Properties Class 2 plates / A 387			
	Classific.	C	Mn	P max.	S max.	Si max.	Cr	Mo	Tensile strength KSI	Yield strength KSI min.	Elongation min % GL=8"
A387 Gr.12	0.05-0.17	0.40-0.65	0.035	0.035	0.15-0.40	0.80-1.15	0.45-0.60	65-85	40	19	22
A387 Gr.11	0.05-0.17	0.40-0.65	0.035	0.035	0.50-0.80	1.00-1.50	0.45-0.65	75-100	45	18	22
A387 Gr.22	0.05-0.15	0.30-0.60	0.035	0.035	0.50	2.00-2.50	0.90-1.10	75-100	45	-	18
A387 Gr. 5	0.15 max.	0.30-0.60	0.035	0.030	0.50	4.00-6.00	0.45-0.65	75-100	45	-	18
A387 Gr.9	0.15 max.	0.30-0.60	0.030	0.030	1.00	8.00-10.00	0.90-1.10	75-100	45	-	18
A387 Gr.91	0.08-0.12	0.30-0.60	0.020	0.010	0.20-0.50	8.00-9.50	0.85-1.10	85-110	45	-	18

( ) = measured on flat specimen

## ASTM A 203 Pressure Vessel Plates, Alloy Steel, Nickel

	C max.	Mn max.	P max.	S max.	Si	Ni	Tensile strength KSI	Yield strength KSI min.	Elongation min %	
									GL=8"	GL=2"
A203 Gr.A	0,21	0,70*	0,035	0,035	0,15-0,40	2,10-2,50	65-85	37	19	23
A203 Gr.B	0,17	0,70*	0,035	0,035	0,15-0,40	2,10-2,50	70-90	40	17	21
A203 Gr.D	0.17	0.70*	0.035	0.035	0.15-0.40	3.25-3.75	65-85	37	19	23
A203 Gr.E	0.20	0.70*	0.035	0.035	0.15-0.40	3.25-3.75	70-90	40	17	21

## ASTM A 204 Pressure Vessel Plates, Alloy Steel, Molybdenum

C	Mn max.	P max.	S max.	Si	Mo	Tensile strength KSI (Mpa)	Yield strength KSI min.	Elongation min %	
						(Mpa)		GL=8"	GL=2"
A204 Gr.A	0.18*	0.90*	0.035	0.15-0.40	0.45-0.60	65-85	37	19	23
						(450-585)			
A204 Gr.B	0.20*	0.90*	0.035	0.15-0.40	0.45-0.60	70-90	40	17	21
						(485-620)			
A204 Gr.C	0.23*	0.90*	0.035	0.15-0.40	0.45-0.60	75-95	43	16	20
						(515-655)			

\* Depending on thickness



# CARBON AND ALLOY STEEL PLATES COMPARISON OF STANDARDS



## Carbon and Alloy Steel Plates Comparison of Standards

USA ASTM	Germany DIN	Europe EN
A283 GR.C	ST 37.2	S235JR
A 285 Gr. C.	H II	P 265 GH
A 516 Gr. 70	19 MN 5	P355 GH
A 204 Gr. A/B	15 Mo 3	16 Mo3
A 387 Gr. 12	13 CrMo 44	13 CrMo 45
A 387 Gr. 11	13 CrMo 44	13 CrMo 45
A387 Gr. 22	10 CrMo 910	10CrMo 910
A 387 Gr. 5	12 CrMo 195	---
A 387 Gr.9	X 11 CrMo 9-1	---
A 203 A/B	---	14Ni 6
A 203 Gr. D/E	10 Ni 14	12 Ni 14





# EXTRACT OF FERRITIC, MARTENSITIC AND AUSTENITIC STEEL FOR PLATES AND TUBESHEETS

## Heat-Resisting Chromium and Chromium Nickel Stainless Steel

EXTRACT OF  
COMPARISON OF STANDARDS BASED ON A240

CHEMICAL ANALYSIS

USA AISI	JAPAN JIS	GUS GOST	Werk- Stoff- No.	Euronorm	C % max.	SI % max.	MN % max.	P % max.	S % max.
			1.4003	X2CrNi12	0.03	1.00	2.00	0.040	0.015
			1.4512	X2CrTi12	0.03	1.00	1.00	0.040	0.015
410S	SUS410S	08Ch13	1.4000	X6Cr13	0.08	1.00	1.00	0.040	0.030
405	SUS405		1.4002	X6CrAl13	0.08	1.00	1.00	0.040	0.030
410	SUS410	12Ch13	1.4006	X12Cr13	0.08-0.15	1.00	1.50	0.040	0.015
(420)		40Ch13	1.4021	X2OCr13	0.16-0.25	1.00	1.50	0.040	0.015
430	SUS430	12Ch17	1.4016	X6Cr17	0.08	1.00	1.00	0.040	0.015
			1.4510	X3CrTi17	0.05	1.00	1.00	0.040	0.015
304	SUS304	08Ch18N10	1.4301	X5CrNi18-10	0.08	0.75	2.00	0.045	0.030
304H	SUS304H		1.4948	X6CrNi18-10	0.04-10	0.75	2.00	0.045	0.030
304L	SUS304L	03Ch18N11	1.4306	X2CrNi19-11	0.03	1.00	2.00	0.045	0.030
321	SUS321	08Ch18N10T	1.4541	X6CrNiTi18-10	0.08	1.00	2.00	0.045	0.030
321 H			1.4878	X8CrNiTi18-10	0.12	1.00	2.00	0.045	0.030
347	SUS347	08Ch18N12B	1.4550	X6CrNiNb18-10	0.08	0.75	2.00	0.045	0.030
347 H			1.4961	X8CrNiNb16-13	0,04-0,10	0,75	2,00	0.045	0.030
316	SUS316	03Ch17M13M2	1.4401	X5CrNiMo17-12-2	0.07	0.75	2.00	0.045	0.030
316L	SUS316L	03Ch17N13M2	1.4404	X2CrNiMo17-12-2	0.03	0.75	2.00	0.045	0.030
316Ti	SUS316Ti	10 Ch17N13	1.4571	X6CrNiMoTi17-12-2	0.08	0.75	2.00	0.045	0.030
31803			1.4462	X2CrNiMoN22-5-3	0.03	1.00	2.00	0.030	0.020
32760			1.4501	X2CrNiMoCuWn25-7-4	0,03	1,00	1,00	0.030	0.010

Not mentioned grades on request.



## MECHANICAL PROPERTIES ACC. TO ASTM A 240

Cr %	Mo %	Ni %	Other elements	0.2%-	TS		Elongation in 2" min, %
				YS Rm N/mm <sup>2</sup> min.	N/mm <sup>2</sup> min	max	
10.50-12.50		0.30-1.00	N:0.030	320	450-650		
10.50-12.50			Ti:6x(C+N)≤0.65	220	380-560		
11.50-14.00		0.75		250	415		22
12.00-14.00		0.75	Al:0.10-0.30	170	415		20
11.50-13.50		0.75		205	450		20
16.00-18.00				280	450-600		
16.00-18.00			Ti:0.30-0.60 N:0.015	205	450		22
16.00-18.00			4x(C+N)+0.15Ti0.80	240	420-600		
18.00-20.00		8.00-10.50	N:0.10	205	515		40
18.00-20.00		8.00-10.50	N:0.10	205	515		40
18.00-20.00		10.00-12.00	N:0.10	170	485		40
17.00-19.00		9.00-12.00	5xC<Ti<0.70	205	515		40
17.00-19.00		9.00-12.00	CB10xCmin , 1,00 max.	205	515		40
17.00-19.00		9.00-12.00	10xC<Nb<1.00	205	515		40
17.00-19.00		9.00-12.00	CB8xCmin , 1,00 max.	205	515		40
16.50-18.50	2.00-2.50	10.00-13.00		205	515		40
16.50-18.50	2.00-2.50	10.00-13.00	N:0.11	170	485		40
16.50-18.50	2.00-2.50	10.50-13.50	Ti:5xC<Ti<0.70	205	515		40
21.00-23.00	2.50-3.50	4.50-6.50	N:0.08-.20	450	620		25
24.0-26.0	3.00-4.00	6.0-8.0	Ni: 0.2-0.3 Co: 0.5-1.0 W: 0.5-1.0	550	750		25



# EXTRACT OF FERRITIC, MARTENSITIC AND AUSTENITIC STEEL FOR PLATES AND TUBESHEETS

USA AISI	JAPAN JIS	GUS GOST	Werk-Stoff-NO.	Euronorm	Delivery Condition	C % max.	P % max.	S % max.
316L	SUS316L	03Ch17N14M2	1.4435	X2CrNiMo18-14-3	K W	0.02	0.045	0.015
317L	SUS317		1.4438	X2CrNiMoN17-13-5	K W	0.03	0.045	0.030
N08904			1.4539	X1NiCrMoCu25-20-5	K W	0.02	0.045	0.035

\*K = cold rolled; W = hot rolled

USA AISI	JAPAN JIS	GUS GOST	Werk-Stoff-NO.	Euronorm	C % max.	Si % max.	P % max.	S % max.	Mn % max.
<b>FERRITIC STEEL GRADES</b>									
		15Ch6SJ <sub>u</sub>	1.4713	X10CrAl7	0,12	0.5-1.0	0.040	0.015	
		10Ch13SJ <sub>u</sub>	1.4724	X10CrAl13	0,12	0.7-1.4	0.040	0.015	
442			1.4742	X10CrAl18	0,12	0.7-1.4	0.040	0.015	
446			1.4762	X10CrAl24	0,12	0.7-1.4	0.040	0.015	1.00

## AUSTENITIC STEEL GRADES

321H		12Ch18N10T	1.4878	X12CrNiTi18-9	0,12	1.0	0.045	0.015	2.00
309		20Ch20N14S2	1.4828	X15CrNiSi20-12	0,20	1.5-2.5	0.045	0.015	2.00
310S			1.4845	X12CrNi25-21	0,15	1.5	0.045	0.015	2.00
310		20Ch25N20S2	1.4841	X15CrNiSi25-20	0,20	1.5-2.5	0.045	0.015	2.00

Not mentioned grades on request.







Si % max.	Mn % max.	Cr %	Mo %	Ni %	others %	YS Rp0.2 N/mm <sup>2</sup> min.	TS Rm N/mm <sup>2</sup>	Elongation in 2 " min, %
0.50	2.00	17.00-18.50	2.00-2.50	11.50-13.50	Ti:0.40-0.60	190	490-690	40
0.75	2.00	18.00-20.00	3.00-4.00	11.00-15.00	N:0,11	190 240 220	490-690 550-700 550-700	35
1.00	2.00	19.00-23.00	4.00-5.00	23.00-28.00	Cu:1.00-2.00	290 270	580-780 580-780	30

Al %	Cr %	Ni %	others %	YS Rp0.2 N/mm <sup>2</sup> min.	TS Rm N/mm <sup>2</sup>	Elonsation L <sub>0</sub> = 5 do long
0.5-1.0	6.0-8.0			220	420-620	20
0.7-1.2	12.0-14.0	1.00		250	450-650	15
0.7-1.2	17.0-19.0			270	450-650	15
1.2-1.7	23.0-26.0	1.00		280	520-720	10

	17.0-19.0	9.0-11.5	Ti <sub>≥</sub> 5xC <sub>≤</sub> 0.80	210	500-750	40
	19.0-21.0	11.0-13.0	N <sub>≤</sub> 0.11	230	500-750	30
	24.0-26.0	19.0-22.0	N <sub>≤</sub> 0.11	210	500-750	35
	24.0-26.0	19.0-22.0	N <sub>≤</sub> 0.11	230	550-800	30





## Nickel, Nickel Alloy and Titanium

### Extract of Nickel Alloy Plates

Norm	Grade	Chemical Composition %								
		C max.	Si max.	Mn max.	P max.	S max.	Cr min-max	Ni min-max	Mo min-max	Ti
ASTM B 162	Alloy 200	0,15	0,35	0,35	-	0,01	-	99,0 min	-	-
UNS-Grade	N02200	0,15	0,35	0,35	-	0,01	-	99,0 min	-	-
ASTM B 127	Alloy 400	0,300	0,50	2,00	-	0,024	-	63,0 min	-	-
UNS-Grade	N04400	0,300	0,50	2,00	-	0,024	-	63,0 min	-	-
ASTM B 168	Alloy 600	0,150	0,50	1,00	-	0,015	14,0-17,0	72,0 min	-	-
UNS-Grade	N06600	0,150	0,50	1,00	-	0,015	14,0-17,0	72,0 min	-	-
ASTM B 443	Alloy 625	0,10	0,50	0,50	0,015	0,015	20-23	58min	8,6-10,0	0,4 max
UNS-Grade	N06625	0,10	0,50	0,50	0,015	0,015	20-23	58min	8,6-10,0	0,4 max
ASTM B 575	Alloy 276	0,010	0,08	1,00	0,040	0,030	14,5-16,5	remainder	15,0-17,0	-
UNS-Grade	N10276	0,010	0,08	1,00	0,040	0,030	14,5-16,5	remainder	15,0-17,0	-
ASTM B 409	Alloy 800	0,100	1,00	1,50	0,030	0,015	19,0-23,0	30,0-35,0	-	0,15-0,60
UNS-Grade	N08800	0,100	1,00	1,50	0,030	0,015	19,0-23,0	30,0-35,0	-	0,15-0,60
ASTM B 424	Alloy 825	0,050	0,50	1,00	-	0,030	19,5-23,5	38,0-46,0	2,5-3,5	0,60-1,20
UNS-Grade	N08825	0,050	0,50	1,00	-	0,030	19,5-23,5	38,0-46,0	2,5-3,5	0,6-1,2Ž20xC
ASTM B 463	Alloy 8020	0,070	1,00	2,00	0,045	0,035	19,0-21,0	32,0-38,0	2,0-3,0	-
UNS Grade	N08020	0,070	1,00	2,00	0,045	0,035	19,0-21,0	32,0-38,0	2,0-3,0	-

Not mentioned grades on request.

### Titanium Plates

ASTM Grade	Chemical Composition %									
	N max	C max	H max	Fe max	O max	Al max	V max	Pa	Mo	Ni
ASTM B 265 Grade 1	0,03	0,08	0,015	0,20	0,18	-	-	-	-	-
ASTM B 265 Grade 2	0,03	0,08	0,015	0,30	0,25	-	-	-	-	-
ASTM B 265 Grade 3	0,05	0,08	0,015	0,30	0,35	-	-	-	-	-
ASTM B 265 Grade 7	0,03	0,08	0,015	0,30	0,25	-	-	0,12-0,25	-	-
ASTM B 265 Grade 9	0,02	0,08	0,015	0,25	0,15	2,5-3,5	2,0-3,0	-	-	-
ASTM B 265 Grade 11	0,03	0,08	0,015	0,20	0,18	-	-	12,0-0,25	-	-
ASTM B 265 Grade 12	0,03	0,08	0,015	0,30	0,25	-	-	-	0,2-0,4	0,6-0,9



Others min.	Mechanical properties and heat treatment			
	Yield Strength Rp 0,2 N/mm <sup>2</sup>	Tensile Strength Rm N/mm <sup>2</sup>	Elongation A5 %	Heat treatment
Cu 0,25 max.	min. 100	min. 380	40	annealed
CU 0,25 max	min. 100	min. 380	40	annealed
Cu 28,0-34,0;Fe 2,5 max.	min. 195	min. 485	35	annealed
Cu 28,0-34,0;Fe 2,5 max.	min. 195	min. 485	35	annealed
Cu 0,5 max.;Fe 6,0-10,0	min. 240	min. 550	30	annealed
Cu 0,5 max.;Fe 6,0-10,0	min. 240	min. 550	30	annealed
Co + Ta 3,15-4,15, Al 0,40 max	min. 379	min. 758	30	annealed
Co + Ta 3,15-4,15, Al 0,40 max	min. 379	min. 758	30	annealed
Lo: 2,5 max., V: 0,035 max	min. 283	min. 690	40	annealed
Lo: 2,5 max., V: 0,035 max	min. 283	min. 690	40	annealed
Cu 0,75 max.;Al 0,15-0,6;Fe 39,5 min	min. 205	min. 520	30	annealed
Cu 0,75 max.;Al 0,15-0,6;Fe 39,5 min.	min. 205	min. 520	30	annealed
Cu 1,5-3,0;Al 0,2 max.;Fe 22,0 min.	min. 241	min. 586	30	annealed
Cu 1,5-3,0;Al 0,2 max.;Fe Rest	min. 241	min. 586	30	annealed
Cu 3-4;Nb+Ta 8xC max. 1,0;Fe REM	min. 241	min. 551	30	annealed
Cu 3-4;Nb+Ta 8xC max.1,0;Fe REM	min. 241	min. 551	30	annealed

Remark: Mechanical properties are for hot rolled annealed execution.

			Mechanical properties and heat treatment		
Residuals/ Each	Residuals/ Total	Titanium	Rp 0,2 N/mm <sup>2</sup>	Rm N/mm <sup>2</sup>	A 5 % min.
0,1	0,4	Rem.	170 min.	240 min.	24
0,1	0,4	Rem.	275 min.	345 min.	20
0,1	0,4	Rem.	345 min.	450 min.	18
0,1	0,4	Rem.	275 min.	345 min.	20
0,1	0,4	Rem.	620 min.	483 min.	10
0,1	0,4	Rem.	170 min.	240 min.	24
0,1	0,4	Rem.	345 min.	483 min.	18



# Plates and Tubesheets - Copper Alloy

## COPPER ALLOY NO. C28000 (Muntz Metal, 60 %)

Composition-percent	Nominal	Minimum	Maximum	Nearest Applicable ASTM Specifications	
Copper	60	59.0	63.0	Plate Products	-
Lead	-	-	.30		
Iron	-	-	.07		
Zinc	40	Remainder			

Physical Properties	English Units	C. G. S. Units
Melting Point (Liquidus)	1660 F	905 C
Melting Point (Solidus)	1650 F	900 C
Density	.303 lb/cu in @ 68 F	8.39 gm/cu cm @ 20 C
Specific Gravity	8.39	8.39
Coefficient of Thermal Expansion	.0000116 per °F from 68 F to 572 F	.0000208 per °C from 20 C to 300 C
Thermal Conductivity	71 Btu/sq ft/ft/hr/°F @ 68 F	.29 cal/sq cm/cm/sec/°C @ 20 C
Electrical Resistivity (Annealed)	37.0 Ohms (circ mil/ft) @ 68 F	6.16 Microhm-cm @ 20 C
Electrical Conductivity * (Annealed)	28% IACS @ 68 F	.162 Megmho-cm @ 20 C
Thermal Capacity (Specific Heat)	.09 Btu/lb °F @ 68 F	.09 cal/gm/°C @ 20 C
Modulus of Elasticity (Tension)	15.000 ksi	10.500 Kg/sq mm
Modulus of Rigidity	5.600 ksi	3.900 Kg/sq mm

\*Volume Basis

## COPPER ALLOY NO. C36500 (Leaded Muntz Metal, Uninhibited)

Composition-percent	Nominal	Minimum	Maximum	Nearest Applicable ASTM Specifications	
Copper	59.5	58.0	61.0	Plate Products	B171
Lead	.5	.25	.7		
Iron	-	-	.15		
Tin	-	-	.25		
Zinc	40	Remainder			

Physical Properties	English Units	C. G. S. Units
Melting Point (Liquidus)	1650 F	900 C
Melting Point (Solidus)	1630 F	885 C
Density	.304 lb/cu in @ 68 F	8.41 gm/cu cm @ 20 C
Specific Gravity	8.41	8.41
Coefficient of Thermal Expansion	.0000116 per °F from 68 F to 572 F	.0000208 per °C from 20 C to 300 C
Thermal Conductivity	71 Btu/sq ft/ft/hr/°F @ 68 F	.29 cal/sq cm/cm/sec/°C @ 20 C
Electrical Resistivity (Annealed)	37.0 Ohms (circ mil/ft) @ 68 F	6.16 Microhm-cm @ 20 C
Electrical Conductivity * (Annealed)	28% IACS @ 68 F	.162 Megmho-cm @ 20 C
Thermal Capacity (Specific Heat)	.09 Btu/lb °F @ 68 F	.09 cal/gm/°C @ 20 C
Modulus of Elasticity (Tension)	15.000 ksi	10.500 Kg/sq mm
Modulus of Rigidity	5.600 ksi	3.900 Kg/sq mm





## COPPER ALLOY NO. C44300 (Admiralty, Arsenical)

Composition-percent	Nominal	Minimum	Maximum	Nearest Applicable ASTM Specifications	
Copper	71	70.0	73.0	Plate Products	B171
Lead			.07		
Iron			.06		
Tin	1	.8	1.2		
Arsenic		.02	.06		
Zinc	28	Remainder			
Physical Properties			English Units	C. G. S. Units	
Melting Point (Liquidus)			1720 F	935 C	
Melting Point (Solidus)			1650 F	900 C	
Density			.308 lb/cu in @ 68 F	8.53 gm/cu cm @ 20 C	
Specific Gravity			8.53	8.53	
Coefficient of Thermal Expansion			.0000112 per F from 68 F to 572 F	.0000202 per C from 20 C to 300 C	
Thermal Conductivity			64 Btu/sq ft/ft/hr/F @ 68 F	.26 cal/sq cm/cm/sec/C @ 20 C	
Electrical Resistivity (Annealed)			41.5 Ohms (circ mil/ft) @ 68 F	6.90 Microhm-cm @ 20 C	
Electrical Conductivity * (Annealed)			25% IACS @ 68 F	.145 Megmho-cm @ 20 C	
Thermal Capacity (Specific Heat)			.09 Btu/lb F @ 68 F	.09 cal/gm/C @ 20 C	
Modulus of Elasticity (Tension)			16.000 ksi	11.200 Kg/sq mm	
Modulus of Rigidity			6.000 ksi	4.200 Kg/sq mm	

## COPPER ALLOY NO. C46400 (Naval Brass, Uninhibited) COPPER ALLOY NO. C46500 (Naval Brass, Arsenical)

Composition-percent	Nominal	Minimum	Maximum	Nearest Applicable ASTM Specifications	
C46400				Plate Products	B171
Copper	60	59.0	62.0		
Lead			.20		
Iron			.10		
Tin	.8	.50	1.0		
Zinc	39.2	Remainder			
C46500-Same as C46400 with:					
Arsenic		.02	.06		
Physical Properties			English Units	C. G. S. Units	
Melting Point (Liquidus)			1650 F	900 C	
Melting Point (Solidus)			1630 F	885 C	
Density			.304 lb/cu in @ 68 F	8.41 gm/cu cm @ 20 C	
Specific Gravity			8.41	8.41	
Coefficient of Thermal Expansion			.0000118 per F from 68 F to 572 F	.0000212 per C from 20 C to 300 C	
Thermal Conductivity			67 Btu/sq ft/ft/hr/F @ 68 F	.28 cal/sq cm/cm/sec/C @ 20 C	
Electrical Resistivity (Annealed)			39.9 Ohms (circ mil/ft) @ 68 F	6.63 Microhm-cm @ 20 C	
Electrical Conductivity * (Annealed)			26% IACS @ 68 F	.151 Megmho-cm @ 20 C	
Thermal Capacity (Specific Heat)			.09 Btu/lb F @ 68 F	.09 cal/gm/C @ 20 C	
Modulus of Elasticity (Tension)			15.000 ksi	10.500 Kg/sq mm	
Modulus of Rigidity			5.600 ksi	3.900 Kg/sq mm	



# Plates and Tubesheets - Copper Alloy

## COPPER ALLOY NO. C61400 (Aluminium Bronze, 7%)

Composition-percent		Nominal	Minimum	Nearest Applicable MaximumASTM Specifications	
Copper (incl. Silver)	91		Remainder	Plate Products	B169, B171
Lead			.01		
Iron	2	1.5	3.5		
Zinc			.20		
Aluminium	7	6.0	8.0		
Manganese			1.0		
Phosphorus			.015		

Physical Properties	English Units	C. G. S. Units
Melting Point (Liquidus)	1915 F	1045 C
Melting Point (Solidus)	1905 F	1040 C
Density	.285 lb/cu in @ 68 F	7.89 gm/cu cm @ 20 C
Specific Gravity	7.89	7.89
Coefficient of Thermal Expansion	.0000090 per °F from 68 F to 572 F	.0000162 per °C from 20 C to 300 C
Thermal Conductivity	39 Btu/sq ft/ft/hr/°F @ 68 F	.16 cal/sq cm/cm/sec/°C @ 20 C
Electrical Resistivity (Annealed)	74.1 Ohms (circ mil/ft) @ 68 F	12.3 Microhm-cm @ 20 C
Electrical Conductivity * (Annealed)	14% IACS @ 68 F	.081 Megmho-cm @ 20 C
Thermal Capacity (Specific Heat)	.09 Btu/lb °F @ 68 F	.09 cal/gm/°C @ 20 C
Modulus of Elasticity (Tension)	17.000 ksi	12.000 Kg/sq mm
Modulus of Rigidity <small>*Volume Basis</small>	6.400 ksi	4.500 Kg/sq mm

## COPPER ALLOY NO. C63000 (Nickel Aluminium Bronze, 10%)

Composition-percent		Nominal	Minimum	Nearest Applicable MaximumASTM Specifications	
Copper (incl. Silver)	82			Plate Products	B171
Iron	3	2.0	4.0		
Tin			.20		
Zinc			.30		
Aluminium	10	9.0	11.0		
Manganese			1.5		
Silicon			.25		
Nickel (incl. Cobalt)	5	4.0	5.5		

Physical Properties	English Units	C. G. S. Units
Melting Point (Liquidus)	1930 F	1054 C
Melting Point (Solidus)	1895 F	1035 C
Density	.274 lb/cu in @ 68 F	7.58 gm/cu cm @ 20 C
Specific Gravity	7.58	7.58
Coefficient of Thermal Expansion	.0000090 per °F from 68 F to 572 F	.0000162 per °C from 20 C to 300 C
Thermal Conductivity	22.6 Btu/sq ft/ft/hr/°F @ 68 F	.09 cal/sq cm/cm/sec/°C @ 20 C
Electrical Resistivity (Annealed)	116 Ohms (circ mil/ft) @ 68 F	19.2 Microhm-cm @ 20 C
Electrical Conductivity * (Annealed)	7% IACS @ 68 F	.041 Megmho-cm @ 20 C
Thermal Capacity (Specific Heat)	.09 Btu/lb °F @ 68 F	.09 cal/gm/°C @ 20 C
Modulus of Elasticity (Tension)	17.500 ksi	12.250 Kg/sq mm
Modulus of Rigidity	6.400 ksi	4.500 Kg/sq mm



## COPPER ALLOY NO. C70600 (Copper Nickel, 90/10)

Composition-percent	Composition			Nearest Applicable ASTM Specifications	
	Nominal	Minimum	Maximum		
Copper (incl. Silver)	88.6		Remainder	Plate Products	B122, B171
Lead			.05*		
Iron	1.4	1.0	1.8		
Zinc			1.0*		
Nickel	10	9.0	11.0		
Manganese			1.0		

\* When the product is for subsequent welding applications and so specified by the purchaser, Zn shall be .50% max., Pb .025% max., P .02% max., Sulfur .02% max. and Carbon .05% max.

Physical Properties	English Units	C. G. S. Units
Melting Point (Liquidus)	2100 F	1150 C
Melting Point (Solidus)	2010 F	1100 C
Density	.323 lb/cu in @ 68 F	8.94 gm/cu cm @ 20 C
Specific Gravity	8.94	8.94
Coefficient of Thermal Expansion	.0000095 per °F from 68 F to 572 F	.0000171 per °C from 20 C to 300 C
Thermal Conductivity	26 Btu/sq ft/ft/hr/°F @ 68 F	.11 cal/sq cm/cm/sec/°C @ 20 C
Electrical Resistivity (Annealed)	115 Ohms (circ mil/ft) @ 68 F	19.1 Microhm-cm @ 20 C
Electrical Conductivity * (Annealed)	9.0% IACS @ 68 F	.0522 Megmho-cm @ 20 C
Thermal Capacity (Specific Heat)	.09 Btu/lb °F @ 68 F	.09 cal/gm/°C @ 20 C
Modulus of Elasticity (Tension)	18.000 ksi	12.700 Kg/sq mm
Modulus of Rigidity	6.800 ksi	4.800 Kg/sq mm

## COPPER ALLOY NO. C71500 (Copper Nickel, 70/30)

Composition-percent	Composition			Nearest Applicable ASTM Specifications	
	Nominal	Minimum	Maximum		
Copper	69.5		Remainder	Plate Products	B122, B171
Lead			.05*		
Iron	.5	.40	1.0		
Zinc			1.0*		
Nickel	30	29.0	33.0		
Manganese			1.0		

When the product is for subsequent welding applications and so specified by the purchaser, Zn shall be .50% max., Pb .025% max., P .02% max., Sulfur .02% max. and Carbon .05% max.

Physical Properties	English Units	C. G. S. Units
Melting Point (Liquidus)	2260 F	1240 C
Melting Point (Solidus)	2140 F	1170 C
Density	.323 lb/cu in @ 68 F	8.94 gm/cu cm @ 20 C
Specific Gravity	8.94	8.94
Coefficient of Thermal Expansion	.0000090 per °F from 68 F to 572 F	.0000162 per °C from 20 C to 300 C
Thermal Conductivity	17 Btu/sq ft/ft/hr/ °F @ 68 F	.07 cal/sq cm/cm/sec/ °C @ 20 C
Electrical Resistivity (Annealed)	225 Ohms (circ mil/ft) @ 68 F	37.5 Microhm-cm @ 20 C
Electrical Conductivity * (Annealed)	4.6% IACS @ 68 F	.0267 Megmho-cm @ 20 C
Thermal Capacity (Specific Heat)	.09 Btu/lb °F @ 68 F	.09 cal/gm/ °C @ 20 C
Modulus of Elasticity (Tension)	22.000 ksi	15.500 Kg/sq mm
Modulus of Rigidity	8.300 ksi	5.800 Kg/sq mm



# Forged Tubesheets

## ASTM A 105 Carbon Steel Forgings for Piping Applications

Code Max.	C max.	Mn max.	P max.	S max.	Si max.	Cu max.	Ni max.	Cr max.	Mo	V
A 105/A		0,35	0,60-1,05	0,035	0,040	0,10-0,35	0,40	0,40	0,30	0,120,08
	Tensile Strength Min, ksi (MPa) min, %		Yield strength Min, ksi (Mpa)		Elongation in 2 in. or 50 mm,					
A 105/A	70 (485)		36 (250)		30					

## ASTM A 266 Carbon Steel Forgings for Pressure Vessel Components

Code	C max.	Mn	P max.	S max.	Si	Tensile Strength Min, ksi (MPa)	Yield strength Min. Ksi (Mpa)	Elongation in 2 in. or 50 mm, min %	Reduction of area, min, %
Gr. 1	0,30	0,40-1,05	0,025	0,025	0,15-0,35	60- 85 (415-585)	30 (205)	23	38
Gr. 2	0,30	0,40-1,05	0,025	0,025	0,15-0,35	70- 95 (485-655)	36 (250)	20	33
Gr. 3	0,35	0,80-1,35	0,025	0,025	0,15-0,35	75-100 (515-690)	37,5 (260)	19	30
Gr. 4	0,30	0,80-1,35	0,025	0,025	0,15-0,35	70- 95 (485-655)	36 (250)	20	33

## ASTM A 723 Alloy Steel Forgings for High-Strength Pressure Component Application

Code	C Max.	Mn max.	P max.	S max.	Si max.	Ni	Cr	Mo	V max.
Gr. 1	0,35	0,90	0,015	0,015	0,35	1,5-2,25	0,80-2,00	0,20-0,40	0,20
Gr. 2	0,40	0,90	0,015	0,015	0,35	2,3-3,3	0,80-2,00	0,30-0,50	0,20
Gr. 3	0,40	0,90	0,015	0,015	0,35	3,3-4,5	0,80-2,00	0,40-0,80	0,20
	Tensile Strength Min, ksi (MPa)		Yield strength (0,2 % offset), Min, ksi (MPa)		Elongation in 2 in. or 50 mm, min, %		Reduction of area, min, %		
Gr. 1	115 (795)		100 (690)		16		50		
Gr. 2	135 (930)		120 (825)		14		45		
Gr. 3	155 (1070)		140 (965)		13		40		

## ASTM A 182 Forged or Rolled Alloy Steel Forgings

Code	C	Mn	P max.	S max.	Si	Ni max.	Cr	Mo	Cb
F 5a	0,25	0,60	0,040	0,030	0,50	0,50	4,0-6,0	0,44-0,65	
F 9	0,15	0,30-0,60	0,030	0,030	0,50-1,00	8,0-10,0	0,90-1,10		
F 91	0,08-0,12	0,30-0,60	0,020	0,010	0,20-0,50	0,40	8,0-9,5	0,85-1,05	0,06-0,10
F 11	0,05-0,15	0,30-0,60	0,030	0,030	0,50-1,00	1,00-1,50	0,44-0,65		
F 22	0,05-0,15	0,30-0,60	0,040	0,040	0,50	2,00-2,50	0,87-1,13		
Code	Tensile Strength Min, ksi (MPa)		Yield strength Min, ksi (Mpa)		Elongation in 2 in. or 50 mm, min, %		Reduction of area, min, %		
F 5a	90 (620)		65 (450)		22		50		
F 9	85 (585)		55 (380)		20		40		
F 91	85 (585)		60 (415)		20		40		
F 11-Gr.1	60 (415)		30 (205)		20		45		
F 22-Gr.1	60 (415)		30 (205)		20		35		

Chemical composition in %





## Group of ASTM standards for Stainless Steel

- ASTM A 167 : Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
- ASTM A 240 : Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate and Sheet, and Strip
- ASTM A 480 : General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
- Other : standards on request

## Group of ASTM standards for Steel-Structural, Reinforcing, Pressure Vessel, Railway, Fasteners

- ASTM A 36 : Spec. for Structural Steel
- ASTM A 202 : Pressure Vessel Plates, Alloy Steel, Chromium-Manganese- Silicon
- ASTM A 203 : Pressure Vessel Plates, Alloy Steel, Nickel
- ASTM A 204 : Pressure Vessel Plates, Alloy Steel, Molybdenum
- ASTM A 285 : Pressure Vessel Plates, Carbon Steel, Low- and Intermediate-Tensile Strength
- ASTM A 387 : Pressure Vessel Plates, Alloy Steel, Chromium-Molybdenum
- ASTM A 515 : Pressure Vessel Plates, Carbon Steel, for Intermediate- and Higher-Temperature Service
- ASTM A 516 : Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service
- ASTM A 517 : Pressure Vessel Plates, Alloy Steel, High-Strength, Quenched and Tempered
- Other : standards on request

## Group of ASTM standards for Nickel and Nickel Alloys

- ASTM B 127 : Nickel-Copper Alloy (UNS NO4400) Plate, Sheet and Strip
- ASTM B 162 : Specification for Nickel Plate, Sheet and Strip
- ASTM B 168 : Nickel-Chromium-Iron Alloys(UNS NO6600, NO6601 and NO6690) and Nickel-Chromium-Cobalt-Molybdenum-Columbium Alloy(UNS NO6617) Plate, Sheet and Strip
- ASTM B 409 : Nickel-Iron-Chromium Alloy Plate, Sheet and Strip
- ASTM B 424 : Ni-Fe-Cr-Mo-Cu Alloy (UNS NO8825 and NO8221) Plate, Sheet and Strip
- ASTM B 443 : Nickel-Chromium-Molybdenum-Columbium Alloy (UNS NO6625) Plate, Sheet and Strip
- ASTM B 463 : UNS NO8020, UNS NO8026 and UNS NO8024 Alloy Plate, Sheet
- ASTM B 625 : UNS NO8904, UNS No8925, UNS NO8031, UNS NO8932 and UNS NO8926, Plate, Sheet and Strip
- ASTM B 709 : Specification for Iron-Nickel-Chromium-Molybdenum Alloy (UNS NO8028) Plate, Sheet and Strip
- Other : standards on request

## Group of ASTM standards for Copper and Copper Alloys

- ASTM B 121 : Leaded Brass Plate, Sheet, Strip and Rolled Bar
- ASTM B 169 : Aluminium Bronze Plate, Sheet, Strip and Rolled Bar
- ASTM B 171 : Copper-Alloy Plate and Sheet for Pressure Vessels, Condensers and Heat Exchangers
- ASTM B 248 : General requirements for Wrought Copper and Copper Alloy Plate, Sheet, Strip and Rolled Bar
- Other : standards on request

## Group of ASTM standards for Titanium

- ASTM B 265 : Titanium and Titanium Alloy Strip, Sheet, and Plate

## Group of ASTM Standards for forged Tubesheets, Discs and Rings

- ASTM A 105 : Carbon Steel Forgings for Piping Applications
- ASTM A 182 : Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings and Valves and Parts for High-Temperature Service
- ASTM A 266 : Carbon Steel Forgings for Pressure Vessels Components
- ASTM A 508 : Quenched and Tempered Vacuum-Treated Carbon and Steel Forgings for Pressure Vessels
- ASTM A 541 : Quenched and Tempered Carbon and Alloy Steel Forgings for Pressure Vessel Components
- ASTM A 723 : Alloy Steel Forgings for High-Strength pressure Component Application
- ASTM B 564 : Nickel Alloy Forgings
- Other : standards on request



# Steel Sheets and Plates

Standard Sizes, Thickness and approximate Weight per Piece

Thickness mm	2000mm x 1000mm	2500mm x 1250mm	3000mm x 1500mm	4000mm x 2000mm	5000mm x 2500mm	6000mm x 2000mm	6000mm x 2700mm	8000mm x 2000mm	8000mm x 2500mm	10000mm x 2500mm	12000mm x 3000mm
0,4	6	10									
0,5	8	13									
0,6	10	15									
0,7	11	18									
0,8	13	20									
0,9	14	23									
1,0	16	25									
1,2	19	30									
1,6	26	40	58								
2,0	32	50	72	128							
3,0	48	75	108	192	300	288		384	480	600	
4,0	64	100	144	256	400	384		512	640	800	
5,0	80	125	180	320	500	480		640	800	1000	
6,0	96	150	216	384	600	576		768	960	1200	
7,0	112	175	252	448	700	672		896	1120	1400	2016
8,0	128	200	288	512	800	768		1025	1280	1600	2304
9,0	144	225	324	576	900	864		1152	1440	1800	2592
10,0	160	250	360	540	1000	960		1280	1600	2000	2880
12,0	192	300	432	768	1200	1152	1555	1536	1920	2400	3456
12,5	200	330	450	800	1250	1200	1620	1600	2000	2500	3600
15,0	240	375	540	960	1500	1440	1944	1920	2400	3000	4320
20,0	320	500	720	1280	2000	1920	2592	2560	3200	4000	5760
25,0	400	625	900	1600	2500	2400	3240	3200	4000	5000	
30,0	480	750	1080	1920	3000	2880	3888	3840	4800		
35,0	560	875	1260	2240	3500	3660	4536	4480	5600		
40,0	640	1000	1440	2560	4000	3740	5184	5120			
45,0	720	1125	1620	2880	4500	4320					
50,0	800	1250	1800	3200	5000	4800					
55,0	880	1375	1980	3520							
60,0	960	1500	2160								
65,0	1040	1625	2340	4160							
70,0	1120	1750	2520	4480							
75,0	1200	1875	2700	4800							
80,0	1280	2000	2880	5120							
85,0	1360	2125	3060								
95,0	1520	2375	3420								
100,0	1600	2500	3600								
120,0	1920	6000	4320								
140,0	2240	3500	5040								
160,0	2560	4000									
180,0	2880	4500									
200,0	3220	5000									
220,0	3540	5500									

Weight Factor		
Conversion Factors	Carbon Steel	
Aluminium Brass (Alloy 687)	x	1,057
Admiralty Brass (Alloy 443)	x	1,082
Cu/Ni 90 /10 (Alloy 706)	x	1,133
Cu/Ni 70/30 (Alloy 715)	x	1,133
Stainless steel:	x	1,015
Nickel alloys UNSNO 4400	x	1,125
Nickel alloys UNSNO 6600	x	1,073
Nickel alloys UNSNO 8800	x	1,013
Nickel alloys UNSNO 8810	x	1,013
Nickel alloys UNSNO 8825	x	1,037
Nickel alloys UNSNO 10665	x	1,174

Weight Formula Plates: For Carbon steel  
 Thickness (MM) x Width (METERS) x LENGTH (METERS) x 8 = Kg/Piece



## Stainless Steel & Nickel Alloy Tubes

Seamless Coldfinished Stainless Steel and Nickel Alloy Tubes; Welded Stainless Steel Tubes with Cold Worked Seam; Welded, Colddrawn and Heattreated Stainless Steel Tubes; Seamless and Welded Heatexchanger Tubes in Stainless Steel and Nickel Alloy Grades.

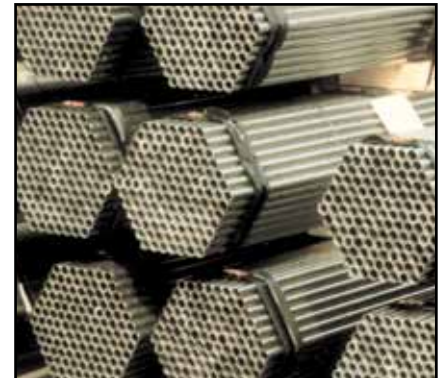
Size Range 6-60,3 mm Outside Diameter, also U-bended.

Grades Stainless Steel: AISI 304 (1.4301), 304L (1.4306), 321 (1.4541), 316 (1.4401/1.4436), 316 L (1.4404/1.4435), 316 Ti (1.4571); Special Ferritic Grades like AISI 405 (1.4002), 410 (1.4006), 430 (1.4016)

Special Grades:

TECHNICHROMO 904 L UNS N 08904, TECHNIDUPLEX 2205 UNS S 31803, DUPLINOS 1905 UNS S 31500, TECRONIMO 28.31.4, etc.; Nickel Alloys like TECHALLOY 200, 400, 600, 800, 825, 8020; Heat resisting Grades such as AISI 310/S and AISI 347.

Titanium Heat Exchanger Tubes in lengths up to 21 m - U-Tubes



Seamless Stainless Steel Tubes

## TPS-OCTG PRODUCT & DELIVERY PROGRAMME:

Tubing and Casing from new production or ex stock with

- TPS-MULTISEAL gastight Premium Two-Step Integral Joint Connections:
- TPS-MULTISEAL-TS 4 / TS 4 TR • TPS-MULTISEAL-TS 6 / TS 6 TR
- TPS-MULTISEAL-TS 8 / TS 8 TR • TPS-MULTISEAL-Flush-Joint
- TPS-TECHNISEAL Premium Coupling Connection
- TPS OPTIFLOW High Performance Coupling Connection

• API Connections as per API Spec. 5B

Tubing and Casing available in all Sizes and Grades according to API 5CT and also TPS-Special Grades.

Pup Joints, Cross-Overs, Couplings, Blast Joints and Accessories in all Grades and Sizes according to Specification.

TPS Drill-Pipe as per API Standard 5D in all grades & sizes up to 5 1/2" incl.



TPS-Multiseal-TS-8 Pin End

## Heatexchanger & Condenser Tubes ex stock

Carbon steel: A 179, A 214, ST 35.8 I,

Alloy steel: A 213/A 199, T 5, T 9

Stainless steel: ASTM A 213 TP 304/L, 321, 316/L, 316Ti

Non Ferrous: Aluminium brass, AL 687, Admiralty brass AL 443,  
Copper Nickel 90/10, AL 706,  
Copper Nickel 90/30, AL 715

## Seamless Stainless Steel Pipes, Fittings and Flanges ex Stock and from new production

Stock Material Grades: TP 304/1.4301, TP 304L/1.4306, TP 321/1.4541, TP 316/1.4401, TP 316L/1.4404, TP 316Ti/1.4571

Stock Sizes: O.D.: 1/2" NB - 12" NB; W.T.: Sch 10S, Sch 40S, 80S, 160  
O.D.: 21,3 mm - 323,9 mm; W.T.: 2,11 - 33,32 mm



Fittings & Flanges

## Fittings in Special Grades for your Piping Systems

Specification/Standards according to ASTM, DIN, BS and other international documentation; in form of: Seamless and Welded Buttweld Fittings, Forged Fittings, Flanges, Forgings, Fittings as per drawing and components according to your design.

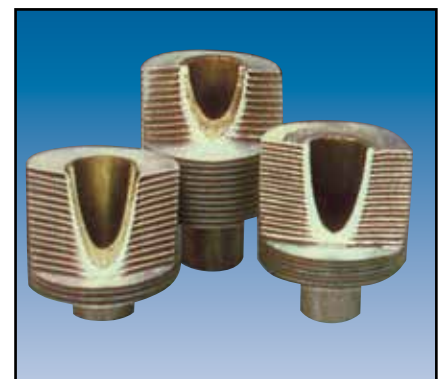
Specification: ASTM A 403, ASTM B 366, ASTM A 815, ASTM B 363, ASTM A 420, ASTM A 182, ASTM A 350, ASTM A 234.

## Heatexchanger- and Condenser Tubes in NON - FERROUS Grades

### Thinwalled Seamless Coldfinished Stainless Steel Tubes

Complete 'Piping Packages' in Stainless Steel Special Grades, e.g. TECHNICHROMO 904 L UNS N 08904, TECHNIDUPLEX 2205 UNS S 31803 and in Nickel Alloys.

The quality management system of TPS production, stock holding and trade is certified according to ISO 9001.



Finned Tubes



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