POPULAR STANDARDS AND SPECIFICATIONS

QUALITY		CHEMICAL ANALYSIS									MECHANICAL PROPERTIES			SPECIFIC REQUIREMENT
SMLS	WELDED	SPECIFICATIOn	WT	C%	Mn%	P5 MAX	S% MAX	Si%	Cr%	Mo%	TENSILE STRENGTH Mpa	YIELD STRENGTH Mpa	ELONGATION in 50 mm/min LONGITUDINAL	
Carbon Steel Pipes / Tubes Conform To Various Specifications As Listed Below														
---	---	ASTM A53'A	AW	0.25Max	0 95Max	0.050	0.060	---	---	---	331 Min	207 Min	36	---
		ASTM A5313	AW	0.30Max	1.20Max	0.050	0.060				413 Min	240 Min	29.5	---
---	---	ASTM A106/A	AW	0 25Max	0 27-0 93	0.025	0.025	0.10 Min	0.40Max	0.15Max	330 Min	205 Min	35/28	CR MO CU NI VA
		ASTM A106/B	AW	0 30Max	0 29-1 06	0.025	0.025	0.10 Min	0.40Max	0.15Max	415 Min	240 Min	30/22	40 15 .40 40 .08
		ASTM A106/C	AW	0 35Max	029-1 06	0.025	0.025	0.10 Min	0.40Max	0.15Max	485 Min	275 Min	30/22	Five Elements Not to E)tceed 1%
---	---	ASTM A179	MW	006-0.18	0.27-0.63	0.048	0.048	---	---	---	325 Min	180 Min	35.0	Hardness 72HRB Max
		ASTM A214	MW	0 18 Max	0.27-0.63	0.050	0.050	---	---	---	385 Min	180 Min	35.0	Hardness 72HRB Max
		ASTM A192	MW	006-0.18	0.27-0 63	0.048	0.048	0.25 max	---	---	325 Min	180 Min	35.0	Hardness 77HRB Max
---	---	ASTM A333/1	AW	030 Max	0.40-1 06	0.025	0.025	----	---	---	380 Min	205 Min	25/20	Impact Test-50F 40x10 J14
		ASTM A333/6	AW	0.30 Max	0.29-1.06	0.025	0.025	0.113 Min	---	---	415 Min	240 Min	30/18	Impact Test-50F 40x10 J14
---	---	ASTM A334/1	MW	0.30 Max	0.40-1.06	0.025	0.025	----	---	---	380 Min	205 Min	35/28	-50F 40x10 J14 85 HRB Max
		ASTM A334/6	MW	030 Max	0.29-1.06	0.025	0.025	0.10 Min	---	---	415 Min	240 Min	30/22	-50F 40x10 J14 85 HRB Max
---	---	BS/3059/90/Part/320		016 Max	0.30-0.70	0.040	0.040	---	---	---	320-480	186 Min	25	---
		BS/3059/90/ParU360		017 Max	044091	0.035	0.035	0.10-0.35	---	---	360-500	235 Min	21	
		BS/3059/90/Part/440		012-0.18	0..90.126	0.035	0.035	0.10-0.35	---	---	480-560	245 Min	22	
---	---	ASTM A210/A-1	MW	0.27 Max	0.93 Max	0.048	0.058	0.10 Min	---	---	415 Min	255 Min	30/22	Hardness 79HRB Max
		ASTM A210/C	MW	a35 Max	0.29-1.06	0.048	0.058	0.10 Min	---	---	485 Min	275 Min	30/22	Hardness B9HRB Max
---	---	DIN/17175/ST35.8		0 17 Max	0-40-0 8C	0 040	0 040	0.35 Max	---	---	340-480	235 Min	25	---
		DIN/17175/ST45.8		022 Max	0.40-1 20	0.040	0.040	0.10-0.35	---	---	410-540	255 Min	21	
---	---	DIN 2391 ST 35	AW	0.17 Max	040 Min	0.025	0.025				340-470	235 Min	25	---
		DIN 2391 ST 45	AW	0.21 Max	0 40 Min	0.025	0.025	---	---	---	440-570	255 Min	21	
		DIN 2391 ST 52	AW	0.22 Max	1.60 Max	0.025	0.025				490-630	355 Min	22	
---	---	ASTM A178/A		0.06-0.18	0.27-0.63	0 050	0 050	0.50-1.0	---	---	325 Min	172 Min	30/22	---
		ASTM A178/C		0.35 Max	080 Max	0.035	0.035	---	---	---	415 Min	255 Min	35	
		ASTM A178/D		0.27 Max	1.00-1.50	0.050	0.050	0.10 Min	---	---	485 Min	180 Min	30	
---	---	BS 6323 Part V/1	AW	0 13 Max	0.60 Max	0.050	0.050	---			300 Min	200 Min	10 / 20	---
		BS 6323 Part V/2	AW	0 16 Max	0 70 Max	0.054	0.054	---	---	---	440 Min	250 Min	8 / 15	
		BS 6323 Part V/3	AW	0.20 Max	0.90 Max	0.050	0.050	0.35 Max			400 Min	300 Min	7/12	

POPULAR STANDARDS AND SPECIFICATIONS

QUALITY		CHEMICAL ANALYSIS									MECHANICAL PROPERTIES			
SMLS	WELDED	SPECIFICATIOn	WT	C%	Mn%	P5 MAX	S% MAX	Si%	Cr%	Mo%	TENSILE STRENGTH Mpa	YIELD STRENGTH Mpa	ELONGATION in 50 mm/min LONGITUDINAL	SPECIFIC REQUIREMENT
PSL - 1	---			0.21 Max	0.60 Max	0.030	0.030				310 Min	172 Min		SMLS C% 0.21 Max
PSL - 1	PSL - 1	API 5L GR. A - 25		0.22 Max	0.90 Max	0.030	0.030				331 Min	207 Min		SMLS C% 0.22 Max
PSL - 1	PSL - 1	API 5L GR. A	AW AW	0.26 Max	1.20 Max	0.030	0.030				414 Min	241 Min		SMLS C% 0.28 Max
PSL - 1	PSL - 1	API 5L GR. B API 51 GR. X -	AW AW	0.26 Max	1.30 Max	0.030	0.030				525 Min	290 Min		SMLS C% 0.28 Max
PSL - 1	PSL - 1	42 API 5L GR. X - 46 API	AW AW	0.26 Max	1.40 Max	0.030	0.030	---	---	---	434 Min	317 Min		SMLS C% 0.28 Max
PSL - 1	PSL - 1	5L GR. X - 52 API 5L GR. X	AW AW	0.26 Max	1.40 Max	0.030	0.030				455 Min	359 Min		SMLS C% 0.28 Max
PSL - 1	PSL - 1	- 56 API 5L GR. X - so API	AW	0.26 Max	1.40 Max	0.030	0.030				490 Min	386 Min		SMLS C% 0.28 Max
PSL - 1	PSL - 1	5L GR. X - 65 API 5L OR X -	AW	0.26 Max	1.40 Max	0.030	0.030				517 Min	414 Min		SMLS C% 0.28 Max
---	PSL - 1	70		0.26 Max	1.45 Max	0.030	0.030				531 Min	448 Min		SMLS C% -
---	PSL - 1			0.26 Max	1.65 Max	0.030	0.030				565 Min	483 Min		
PSL - 2	PSL - 2	API 5L GR. B		0.22 Max	1.20 Max	0.025	0.015				414-758			
PSL - 2	PSL - 2	API 5L GR X - 42	AW AW	0.22 Max	1.30 Max	0.025	0.015				414-758			
PSL - 2	PSL - 2	API 5L GR. X - 46	AW AW	0.22 Max	1.40 Max	0.025	0.015				434-758			
PSL - 2	PSL - 2	API 5L GR. X - 52	AW	0.22 Max	1.40 Max	0.025	0.015				455-758	241-448		
PSL - 2	PSL - 2	API 5L GR. X - 56	AW	0.22 Max	1.40 Max	0.025	0.015	---	---	---	490--758	290496	---	---
PSL - 2	PSL - 2	API 5L GR. X - 60	AW	0.22 Max	1.40 Max	0.025	0.015				517-758	3217		
-	PSL - 2	API 5L GR. X - 65	AW	0.22 Max	1.45 Max	0.025	0.015				531-738			
-	PSL - 2	API 5L GR X - 70		0.22 Max	1.65 Max	0.025	0.015				565-758			
---	---	IS 1978 /YST 210	AW	0 22 Max .	0.90 Max	0.040	0.050	---	---	---	330 Min	210 Min		---
		IS 1978 /YST 240	AW	0.27 Max	1.15 Max	0.040	0 050				410 Min	240 Min		
		IS 1979 /YST 290 IS 1979		0.28 Max	1.25 Max	0.040	0 050				410 Min	290 Min		
		/YST 320 IS 1979 /YST	AW AW	030 Max	1.35 Max	0.040	0.050				430 Min	320 Min		
		360 IS 1979 /YST 390 IS	AW AW	030 Max	1.35 Max	0.040	0.050				450-550	360 Min		
---	---	1979 /YST 410 IS 1979	AW AW	026 Max	1.35 Max	0.040	0.050	---	---	---	490-520	390 Min	---	
		/YST 450 IS 1979 /YST	AW	0.26 Max	1.35 Max	0.040	0.050				520-540	410 Min		
		480		0.26 Max	1.40 Max	0.040	0.050				530-550	450 Min		
				0.23 Max	1.60 Max	0.040	0.050				565 Min	480 Min		
		IS 3589 Gr. 330	AW	0.16 Max	1.20 Max	0.040	0.040				330 Min	195 Min	20 GL=5.65	
---	---	IS 3589 Or 410	AW	0.20 Max	1.30 Max	0.040	0.040	---	---	---	410 Min	235 Min	18 GL=5.85	---
		IS 3589 Or 450	AW	0.25 Max	1.20 Max	0.040	0 040				450 Min	275 Min	15 GL=5.65	
		IS 1161 /YST 210	AW	0.12 Max	0 60 Max	0.050	0 050				330 Min	210 Min	20 GL=5.65	
---	---	IS 1161 /YST 240	AW	0.16 Max	1.20 Max	0.050	0.050	---	---	---	410 Min	240 Min	17 GL=5.56	---
		IS 1161 /YST 310	AW	0.25 Max	1.30 Max	0.050	0.050				450 Min	310 Min	14 GL=5.65	

POPULAR STANDARDS AND SPECIFICATIONS

QUALITY		CHEMICAL ANALYSIS									MECHANICAL PROPERTIES			SPECIFIC REQUIREMENT	
SMLS	WELDED	SPECIFICATIOn	WT	C%	Mn%	P5 MAX	S% MAX	Si%	Cr%	Mo%	TENSILE STRENGTH Mpa	YIELD STRENGTH Mpa	ELONGATION in 50 mm/min LONGITUDINAL		
Alloy Steel Pipes / Tubes Conform To Various Specifications As Listed Below															
		ASTM A335/P1	AW	0 10-0.20	0.30-0 80	0 025	0 025	0.10-0.50	0.10-0.50	-----		380 Min	205 Min	30	
		ASTM A335/P2	AW	0 10-0.20	0 30-0.61	0.025	0.025	0.10-0.30	0.10-0.30	0.50-0.81		380 Min	205 Min	30	
		ASTM A335/P5	AW	0.15 Max	0.30-0 60	0.025	0.025	0.50 Max	0.50 Max	0.44-		415 Min	205 Min	30	
------	------	ASTM A335/P9	AW	0.15 Max	0.30-0 60	0.025	0.025	0.25-1	0.25-1	0.25-1		415 Min	172 Min	30/22	-----
		ASTM A335/P11	AW	0.15 Max	0.30-0 60	0.025	0.025	0.50-1	0.50-1	0.50-1		415 Min	205 Min	30	
		ASTM A335/P12	AW	0.15 Max	0.30-0 61	0.025	0.025	0.50 Max	0.50 Max	0.50 Max		415 Min	205 Min	30	
		ASTM A335/P22	AW	0.15 Max	0.30-0.61	0.025	0.025	0.50 Max	0.50 Max	0.50 Max		415 Min	205 Min	30	
		ASTM A213'T2	MW	0.10-0.20	0 30-0 61	0 045	0 045	0.10-0.30	0.50-0.81	0.44-0.65		415 Min		30/22	Hardness 851-IRB Max
		ASTM A213/T5	MW	0.15 Max	0.30-0.60	0.030	0.030	0.50 Max	4.00-6.00	0.44-0.65		415 Min		30/22	Hardness 85HRB Max
------	------	ASTM A213	MW	0.15 Max	0.30-0 60	0.030	0.030	0.25-1.00	'8.00-10.00	0.90-1.10		415 Min	205 Min 205 Min 170 Min 205 Min	30/22	Hardness 89HRB Max
		ASTM A213/T11	MW	0.15 Max	0.30-.0:60	0.030	0.030	0.50-1.00	1.00-1.50	0.44-0.65		415 Min	205 Min 205 Min	30/22	Hardness 85HRB Max
		ASTM A213/T12	MW	0.15 Max	0 30-0.60	0.045	0.045	0.50 Max	0.80-1.25	0.44-0.65		415 Min		30/22	Hardness 85HRB Max
		ASTM A21311-22	MW	0.15 Max	0 30-0.61	0.030	0.030	0.50 Max	1.90-2.60	0.87-1.13		415 Min		30/22	Hardness 85HRB Max
		BS/3059/90/Part11/620		0.10-0.15	0.40-0.70	0.040	0.040	0.10-0.35	0.70-1.10	0.45-0.55		411-618	235 Min	22	
		BS/3059/90/Partii/622		0.08-0.15	0.40-0.70 040-	0.040	0.040	0.50 Max	2.00-2.50	0.90-1.20		440-590	175 Min	20	
------	------	DIN/17175/13CrM044		0.10-0.18	0.70 0.40-	0 040	0 040	0.10-0.35	0.70-1.00	0.40-0.50		441-570	294 Min	22	AL max 0.020 AL max 0.020
		DINA 7175/10CrM910		0.15 Max	0.60 0.50-	0.040	0.040	0.15-0.50	2.0-2.5	0.90-1.10		441-570	294 Min	22	
		DIN/17175/15M03		0.12-0.20	0.80	0.040	0.040	0.10-0.35	---	0.25-0.35		441-540	284 Min	21	
		ASTM A209/T1	MW	0.10-0,20	0.30-0.80	0.045	0.045	0.15-0.50		0.44-0.65		380 Min	205 Min	30/22	
------	------	ASTM A209/Ta	MW	0.15-0.25	0.30-0.80	0.045	0.045	0.15-0.50	------	0.44-0.65		365 Min	195 Min	30/22	Max Hardness 81HRB Max Hardne
		ASTM A209/T1B	MW	0.14 Max	0.30-0.80	0.045	0.045	0.15-0.50		0.44-0.65		415 Min	220 Min	30/22	

POPULAR STANDARDS AND SPECIFICATIONS

QUALITY		CHEMICAL ANALYSIS									MECHANICAL PROPERTIES			SPECIFIC REQUIREMENT		
SMLS	WELDED	SPECIFICATIOn	WT	C%	Mn%	P5 MAX	S% MAX	Si%	Cr%	Mo%	TENSILE STRENGTH Mpa	YIELD STRENGTH Mpa	ELONGATION in 50 mm/min LONGITUDINAL			
Stainless Steel Pipe / Tube Conform To ASTM/SA312/213 & WP/CR fitting TO ASTM 403 As Listed Below																
		TP 304		.08 Max	200 Max 2.00	0.045	0.030	1.00 Max	18-20		8-11	515 Min	205 Min	28-35	----	
		TP 304 H		04-0.10	Max 2.00	0 045	0 030	1.00 Max	18-20		8-11	515 Min	205 Min	28-35	----	
------	------	TP 304 L		0.035 Max	Max 2.00	0.045	0.030	1.00 Max	18-20	------	8-13	485 Min	170 Min	28-35	----	
		TP 304 LN		0.030 Max	Max 2.00	0.040	0.030	0.75 Max	18-20		8-10.5	515 Min	205 Min	28-35	Nitrogen 0,10-0 16	
		TP 304 N		0.08 Max	Max	0.040	0.030	0.75 Max	18-20		8-11	550 Min	240 Min	28-35	Nitrogen 0.10-0.16	
------	------	TP 309		0.15 Max	2 00 Max	0.045	0.030	1.00 Max	22-24	------	12-15	515 Min	205 Min	28-35	----	
		TP 310		0.15 Max	2.00 Max	0.045	0.030	1.50 Max	24-26		19-22	515 Min	205 Min	28-35	----	
		TP 316		0.08 Max	2.00 Max	0.045	0.030	1.00 Max	16-18	2-3	10-14	515 Min	205 Min	28-35	----	
		TP 316 H		0.04-1.0	2.00 Max	0 045	0 030	1.00 Max	16-18	2-3	10-14	515 Min	205 Min	28-35	----	
------	------	TP 316 LN		0.30 Max	2.00 Max	0.040	0.030	1.00 Max	16-18	2-3	11-14	515 Min	205 Min	28-35	Nitrogen 0,10-0 16	
		TP 316 L		0.35 Max	2.00 Max	0.045	0.030	0.75 Max	16-18	2-3	10-15	485 Min	170 Min	28-35	----	
		TP 416 N		0.08 Max	2.00 Max	0.040	0.030	0.75 Max	16-18	2-3	11-14	550 Min	240 Min	28-35	Nitrogen 0.10-0.16	
------	------	TP 321		0.8 Max	2.00 Max	0.045	0.030	1.00 Max	17-20	------	9-13	515 Min	205 Min	28-35	----	
		TP 321 H		0.4-0.10	2.00 Max	0.045	0.030	1.00 Max	17-20		9-13	515 Min	205 Min	28-35	----	
------	------	TP 347		0.08 Max	2.00 Max	0.045	0.030	1.00 Max	17-20	------	9-13	515 Min	205 Min	28-35	----	
		TP 347 H		0.04-1.0	2.00 Max	0.045	0.030	1.00 Max	17-20		9-13	515 Min	205 Min	28-35	----	
Low Temperature Service Fitting Confirm to ASTM/420																
		WPL 6		0.30 Max	0.39-1.06	0.030	0.030	1 Min			----	415-585	240 Min	22-30	-50 F10x1W176	
------	------	WPL 9		0.20 Max	0.40-1.06	0.030	0.030	----	------	------	1.6-2.24	435-610	315 Min	22-28	-100F10x10J17.6	
		WPL 3		0.20 Max	0.31-0.64	0.050	0.050	13-37			3.1-3.82	450-620	240 Min	22-30	-150F10x10J176	
		WPL 8		0.13 Max	0.90 Max	0 030	0 030	13-37			8.4-9.6	690-865	515 Min	16-20	-32eF10x10J33.9	
High Temperature Service Fitting Confirm to ASTM/234																
		WPB		0.30 Max	0.29-1.06	0 050	0 050	10 Min	----	----		415 Min	240 Min	22-38			
		WPC		0 35 Max	0 29-1 06	0.050	0.050	10 Min	----	----		485 Min	275 Min	22-30			
		WPB 1		0.28 Max	0.30-0 90	0 045	0 045	10.50	----	44-0 65		380 Min	205 Min	22-30			
		WP 124 11/C12*		0.20 Max	0.30-0.80	0 045	0 045	60 Max	80-1 25	44-0.65		415 Min	205 Min	22-30	C12*	485 Min	275 Min
------	------	WP 11CL 12/C13*		0 20 Max	0.30-0.80	0 040	0 040	50-1 00	1 0-1 5	44-0 65	------	485 Min	275 Min	22-30	C13*	515 Min	810 Min
		WP lib		0.15 Max	0.30-0.60	0.030	0 030	50-1 00	1 0-1 5	44-0.65		415 Min	205 Min	22-30			
		WP 22 CL 1/CL3*		0.15 Max	0.30-0.60	0.040	0 040	50 Max	1 9-2.6	87-1 13		415 Min	205 Min	22-30	C13'	515 Min	810 Min
		WP 5		0.15 Max	0 30-0.60	0 040	0.030	50 Max	4 0-6 0	44-0 65		415 Min	205 Min	22-30			
		WP 9		0.15 Max	0.30-0.60	0 030	0 030	25-1 00	8 0-10	90-1 11		415 Min	205 Min	22-30			

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