

## CHEMICAL COMPOSITION OF CARBON STEEL CARBON STEEL, ALLOY STEEL, LOW TEMP, PIPE & TUBES SPECIFICATION

CHEMICAL ANALYSIS									Mechanical Properties			SPECIFIC REQUIREMENT
Specification	WT	C%	Mn%	P% MAX	S% MAX	Si%	Cr%	Mo%	Tensile Strength	Yield Strength	Elongation	
									Mpa	Mpa	50mm MIN Longitudinal	
ASTM A 53/A	AW	0.25MAX	0.95MAX	0.050	0.060	-	-	-	331MIN	207 MIN	36	Cr Mo Cu Ni Va 0.40 0.15 0.40 0.40 0.08 five elements not to exceed 1%
ASTM A 53/B	AW	0.30MAX	1.20MAX	0.050	0.060	-	-	-	413MIN	240MIN	29.5	
ASTM A 106/A	AW	0.25MAX	0.27-	0.025	0.025	0.10MIN	0.40MAX	0.15MAX	330MIN	205MIN	35/28	
ASTM A 106/B	AW	0.30MAX	0.93	0.025	0.025	0.10MIN	0.40MAX	0.15MAX	415MIN	240MIN	30/22	
ASTM A 106/C	AW	0.35MAX	0.29- 1.06 0.29- 1.06	0.025	0.025	0.10MIN	0.40MAX	0.15MAX	485MIN	275MIN	30/22	
ASTM A 179	MW	0.06-018	0.27-	0.048	0.048	-	-	-	325MIN	180MIN	35.0	Hardness 72 HRB MAX Hardness 72 HRB MAX Hardness 77 HRB MAX Hardness 80 HRB MAX Hardness 81 HRB MAX Hardness 77 HRB MAX Hardness 79 HRB MAX Hardness 89 HRB MAX
ASTM A 214	MW	0.18MAX	0.63	0.050	0.050	-	-	-	385MIN	180MIN	35.0	
ASTM A 192	MW	0.06-0.18	0.27-	0.048	0.048	0.25MAX	-	-	325MIN	180MIN	35.0	
ASTM A 209/T1	MW	0.10-0.20	0.63	0.045	0.045	0.10-0.50	-	0.44-0.65	380MIN	205MIN	30/22	
ASTM A 209/T1a	MW	0.15-0.25	0.27-	0.045	0.045	0.10-0.50	-	0.44-0.65	365MIN	195MIN	30/22	
ASTM A 209/T1B	MW	0.14MAX	0.63	0.045	0.045	0.10-0.50	-	0.44-0.65	415MIN	220MIN	30/22	
ASTM A 210/A-1	MW	0.27MAX	0.30-	0.048	0.058	0.10MIN	-	-	415MIN	255MIN	30/22	
ASTM A 210/C	MW	0.35MAX	0.80 0.30- 0.80 0.30- 0.80 0.93MAX 0.29- 1.06	0.048	0.058	0.10MIN	-	-	485MIN	275MIN	30/22	
ASTM A 213/T2	MW	0.10/0.20	0.30-	0.045	0.045	0.10-0.30	0.50-0.81	0.44-0.65	415MIN	205MIN	30/22	
ASTM A 213/T5	MW	0.15MAX	0.61	0.030	0.030	0.50MAX	4.00-6.00	0.44-0.65	415MIN	205MIN	30/22	
ASTM A 213/T11	MW	0.15MAX	0.30-	0.030	0.030	0.50-1.00	1.00-1.50	0.44-0.65	415MIN	205MIN	30/22	
ASTM A 213/T12	MW	0.15MAX	0.60	0.045	0.045	0.50MAX	0.80-1.25	0.44-0.65	415MIN	220MIN	30/22	
ASTM A 213/T22	MW	0.15MAX	0.30- 0.60 0.30- 0.60 0.30- 0.60	0.030	0.030	0.50MAX	1.90-2.60	0.87-1.13	415MIN	205MIN	30/22	
ASTM A 333/1	AW	0.30MAX	0.40-	0.025	0.025	-	-	-	380MIN	205MIN	25/20	Impact AS-50F FOR 40X10J/18/14 -50F 40X10J/18/14 90 HRB MAX
ASTM A 333/6	AW	0.30MAX	1.06	0.025	0.025	0.10MIN	-	-	415MIN	240MIN	30/22	
ASTM A 334/1	AW	0.30MAX	0.29-	0.025	0.025	-	-	-	380MIN	205MIN	35/28	
ASTM A 334/6	AW	0.30MAX	1.06 0.40- 1.06 0.29- 1.06	0.025	0.025	0.10MIN	-	-	415MIN	240MIN	30/22	
ASTM A 335/P1	AW	0.10-0.20	0.30-	0.025	0.025	0.10-0.50	-	0.44-0.65	380MIN	205MIN	30/22	
ASTM A 335/P2	AW	0.10-0.20	0.80	0.025	0.025	0.10-0.30	0.50-0.81	0.44-0.65	380MIN	205MIN	30/22	
ASTM A 335/P5	AW	0.15MAX	0.30-	0.025	0.025	0.50MAX	4.00-6.00	0.45-0.65	415MIN	205MIN	30/22	
ASTM A 335/P9	AW	0.15MAX	0.61	0.025	0.025	0.25-1.00	8.00-10.00 1.00-	0.09-1.10	415MIN	172MIN	30/22	
ASTM A 335/P11	AW	0.15MAX	0.30-	0.025	0.025	0.50-1.00	1.50	0.44-0.65	415MIN	205MIN	30/22	
ASTM A 335/P12	AW	0.15MAX	0.60	0.025	0.025	0.50MAX	0.80-1.25	0.44-0.65	415MIN	205MIN	50/22	
ASTM A 335/P22	AW	0.15MAX	0.30- 0.60 0.30- 0.60 0.30- 0.60 0.30- 0.60	0.025	0.025	0.50MAX	1.90-2.60	0.87-1.13	415MIN	205MIN	30/22	
BS/3059/1/33		0.15MAX	0.30-	0.050	0.050	-	-	-	324-441	186MIN	25	
BS/3059/2/33		0.15MAX	0.70	0.050	0.050	0.10-0.35	-	-	324-441	186MIN	21	
BS/3059/2/45		0.12-0.18	0.40-	0.035	0.035	0.10-0.35	-	-	441-560	245MIN	22	
BS/3059/2/620		0.10-0.15	0.70- 0.90- 1.20 0.40- 0.70	0.040	0.040	0.10-0.35	0.70-1.10	0.45-0.65	441-618	235MIN	22	
DIN/17175/ST35.8		0.17MAX	0.40MIN	0.040	0.040	0.35MAX	-	-	340-441	235MIN	25	
DIN/17175/ST45.8		0.22MAX	0.45MIN	0.040	0.040	0.10-0.35	-	-	441-540	255MIN	25	
DIN/17175/15MO3		0.12-0.20	0.50-	0.040	0.040	0.10-0.35	-	0.25-0.35	441-540	284MIN	21	
DIN/17175/13CrMO44		0.10-0.18	0.80	0.040	0.040	0.10-0.35	0.70-1.60	0.40-0.50	441-570	294MIN	22	
DIN/17175/10CrM910		0.15MAX	0.40- 0.70 0.40- 0.60	0.040	0.040	0.15-0.50	2.0-2.5	0.9-1.10	441-570	294MIN	22	
ASTM A 199/T5	MW	0.50-0.15	0.30-	0.030	0.030	0.50MAX	4.00-6.00	0.45-0.65	415MIN	170MIN	30/22	Hardness 85 HRB MAX Hardness 85 HRB MAX Hardness 85 HRB MAX Hardness 85 HRB MAX Hardness 85 HRB MAX Hardness 85 HRB MAX Hardness 85 HRB MAX Hardness 85 HRB MAX Hardness 85 HRB MAX Hardness 85 HRB MAX Hardness 85 HRB MAX Hardness 85 HRB MAX Hardness 85 HRB MAX Hardness 85 HRB MAX
ASTM A 199/T11	MW	0.50-0.15	0.60	0.030	0.030	0.50-1.00	1.00-1.50	0.44-0.65	415MIN	170MIN	30/22	
ASTM A 199/T22	MW	0.50-0.15	0.30-	0.030	0.030	0.50MAX	1.90-2.60	0.87-1.13	415MIN	170MIN	30/22	
ASTM A 199/T4	MW	0.15MAX	0.60	0.030	0.030	0.50-1.00	2.15-2.85	0.44-0.65	415MIN	170MIN	30/22	
ASTM A 199/T7	MW	0.15MAX	0.30-	0.030	0.030	0.50-1.00	6.00-8.00	0.45-0.65	415MIN	170MIN	30/22 30/22	
ASTM A 200/T5	MW	0.15MAX	0.60	0.030	0.030	0.50-1.00	4.00-6.00	0.45-0.65	415MIN	170MIN	30/22	
ASTM A 200/T11	MW	0.50-0.15	0.30-	0.030	0.030	0.50-1.00	1.00-1.50	0.44-0.65	415MIN	170MIN	30/22	
ASTM A 200/T22	MW	0.50-0.15	0.60	0.030	0.030	0.50MAX	1.90-2.60	0.87-1.13	415MIN	170MIN	30/22	
ASTM A 200/T4	MW	0.50-0.15	0.30-	0.030	0.030	0.50-1.00	2.15-2.85	0.44-0.65	415MIN	170MIN	30/22	
ASTM A 200/T7	MW	0.15MAX	0.60	0.030	0.030	0.50-1.00	6.00-8.00	0.45-0.65	415MIN	170MIN	30/22	
ASTM A 199/T9	MW	0.15MAX	0.30- 0.60 0.30- 0.60 0.30- 0.60 0.30- 0.60 0.30- 0.60 0.30- 0.60	0.030	0.030	0.25-1.00	8.00-10.0	0.90-1.10	415MIN	170MIN	30/22	