



POPULAR STANDARDS AND SPECIFICATION CHEMICAL ANALYSIS

SMLS	WELED	SPECIFICATION	WT	C%	Mn%	P% MAX	S% MAX	Si%	Cr%	Mo%
*	*	ASTM A 53/A	AW	0.25 MAX	0.050	0.060	-	-	-	-
*	*	ASTM A 53/B	AW	0.30 MAX	0.050	0.060	-	-	-	-
*	-	ASTM A 106/A	AW	0.25 MAX	0.27-0.93	0.025	0.025	0.10MIN	0.40 MAX	0.15 MAX
*	-	ASTM A 106/B	AW	0.30 MAX	0.29-1.06	0.025	0.025	0.10MIN	0.40 MAX	0.15 MAX
*	-	ASTM A 106/C	AW	0.35 MAX	0.29-1.06	0.025	0.025	0.10MIN	0.40 MAX	0.15 MAX
*	-	ASTM A 179	MW	0.06-0.18	0.27-0.63	0.048	0.048	-	-	-
-	*	ASTM A 214	MW	0.18 MAX	0.27-0.63	0.050	0.050	-	-	-
*	-	ASTM A 192	MW	0.06-0.18	0.27-0.63	0.048	0.048	0.25 MAX	-	-
*	-	ASTM A 209/T1	MW	0.10-0.20	0.30-0.80	0.045	0.045	0.10-0.50	-	0.44-0.65
*	-	ASTM A 209/Ta	MW	0.15-0.25	0.30-0.80	0.045	0.045	0.10-0.50	-	0.44-0.65
*	-	ASTM A 209/T1B	MW	0.14 MAX	0.30-0.80	0.045	0.045	0.10-0.50	-	0.44-0.65
*	-	ASTM A 210/A-1	MW	0.27 MAX	0.93 MAX	0.048	0.058	0.10MIN	-	-
*	-	ASTM A 210/C	MW	0.27 MAX	0.35 MAX	0.048	0.058	0.10MIN	-	-
*	-	ASTM A 213/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
*	-	ASTM A 213/T5	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50 MAX	4.00-6.00	0.44-0.65
*	-	ASTM A 213/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
*	-	ASTM A 213/T12	MW	0.15 MAX	0.30-0.61	0.045	0.045	0.50 MAX	0.80-1.25	0.44-0.65
*	-	ASTM A 213/T-22	MW	0.15 MAX	0.30-0.61	0.030	0.030	0.50MAX	1.90-2.60	0.87-1.13
*	*	ASTM A 333/1	AW	0.30 MAX	0.40-1.06	0.025	0.025	-	-	-
*	*	ASTM A 333/6	AW	0.30 MAX	0.29-1.06	0.025	0.025	0.10MIN	-	-
*	*	ASTM A 334/1	MW	0.30 MAX	0.40-1.06	0.025	0.025	-	-	-
*	*	ASTM A 334/6	MW	0.30 MAX	0.29-1.06	0.025	0.025	0.10MIN	-	-
*	-	ASTM A 335/P1	AW	0.10-0.20	0.30-0.80	0.025	0.025	0.10-0.50	-	0.44-0.65
*	-	ASTM A 335/P-2	AW	0.10-0.20	0.30-0.61	0.025	0.025	0.10-0.30	0.50-0.81	0.44-0.65
*	-	ASTM A 335/P5	AW	0.15 MAX	0.30-0.60	0.025	0.025	0.50-0.10	0.44-0.65	0.44-0.65
*	-	ASTM A 335/P11	AW	0.15 MAX	0.30-0.60	0.025	0.025	0.501.00	1.00-1.50	0.44-0.65
*	-	ASTM A 335/P12	AW	0.15 MAX	0.30-0.61	0.025	0.025	0.50 MAX	0.80-1.25	0.44-0.65
*	-	ASTM A 335/P22	AW	0.15 MAX	0.30-0.61	0.025	0.025	0.50 MAX	1.90-2.60	0.87-1.13
*	*	BS/3059/1/33		0.15 MAX	0.30-0.70	0.050	0.050	-	-	-
*	*	BS/3059/2/33		0.15 MAX	0.40-0.70	0.050	0.050	0.10-0.35	-	-
*	-	BS/3059/2/45		0.12-0.18	0.90-1.20	0.035	0.035	0.10-0.35	-	-
*	-	BS/3059/2/620		0.10-0.15	0.40-0.70	0.040	0.040	0.10-0.35	0.70-1.10	0.45-0.65
*	-	DIN/17175/ST35.8		0.17 MAX	0.40 MIN	0.040	0.040	0.35MAX	-	-
*	-	DIN17175/ST45.8		0.22 MAX	0.45 MIN	0.040	0.040	0.10-0.35	-	-
*	-	DIN/17175/15M03		0.12-0.20	0.50-0.80	0.040	0.040	0.10-0.35	-	0.25-0.35
*	-	DIN17175/13CrM044		0.10-0.18	0.40-0.70	0.040	0.040	0.10-0.35	0.70-1.60	0.45-0.65
*	-	DIN17175/10CrM910		0.15 MAX	0.40-0.60	0.040	0.040	0.15-0.50	2.0-2.5	0.9-1.10
*	-	ASTM A 199/T5	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50 MAX	4.00-6.00	0.45-0.65
*	-	ASTM A 199/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
*	-	ASTM A 199/T22	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50 MAX	1.90-2-60	0.87-1.13
*	-	ASTM A 199/T4	MW	0.15 MAX	0.60-0.60	0.030	0.030	0.50-1.00	2.15-2.85	0.45-0.65
*	-	ASTM A 199/T-7	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50-1.00	6.00-800	0.45-0.65
*	-	ASTM A 200/T5	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50-1.00	4.00-6.00	0.45-0.65
*	-	ASTM A 204/T11	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50 MAX	1.00-1.50	0.44-0.65
*	-	ASTM 1 200/T22	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50-1.00	1.90-2.60	0.87-1.13
*	-	ASTM A 200/T4	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50 MAX	2.15-2.85	0.44-0.65
*	-	ASTM A 200/T-7	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50-1.00	6.00-8.00	0.40-0.65
*	-	ASTM A 199/T9	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.25-1.00	8.00-10.0	0.90-1.10
-	-	ASTM A 200/T9	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.25-1.00	8.00-10.0	0.90-1.10
-	-	ASTM A 213/T9	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.25-1.00	8.00-10.0	0.90-1.10
-	*	ASTM A 335/P9	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.25-1.00	8.00-10.0	0.90-1.10
-	*	ASTM A 178/A	MW	0.06-0.18	0.27-0.63	0.050	0.050	0.50-1.00	-	-
-	*	ASTM A178/C	MW	0.35 MAX	0.80 MAX	0.050	0.050	-	-	-
-	*	ASTM A 178/D	MW	0.27 MAX	1.0-1.5	0.030	0.030	0.10MIN	-	-

**POPULAR STANDARDS AND SPECIFICATION PHYSICAL ANALYSIS**

				MECHANICAL PROPERTIES			SPECIFIC REQUIREMENT
				TENSILE STRENGTH	YEILD STRESS	ELONGATION	
SMLS	WELED	SPECIFICATION	WT	MPa	MPa	50mm MIN Longitudinal	
*	*	ASTM A 53/A	AW	331 MIN	207 MIN	36	-
*	*	ASTM A 53/B	AW	413 MIN	240 MIN	29.5	-
*	-	ASTM A 106/A	AW	330 MIN	205 MIN	35/28	CR MO CU NI VA
*	-	ASTM A 106/B	AW	415 MIN	240 MIN	30/22	40.015.40.40.08
*	-	ASTM A 106/C	AW	485 MIN	275 MIN	30/22	FIVE ELEMENTS NOTTO EXCEED 1%
*	-	ASTM A 179	MW	325 MIN	180 MIN	35.0	HARDNESS 72 HRB MAX
-	*	ASTM A 214	MW	385 MIN	180 MIN	35.0	HARDNESS 72 HRB MAX
*	-	ASTM A 192	MW	325 MIN	180 MIN	35.0	HARDNESS 77 HRB MAX
*	-	ASTM A 209/T1	MW	380 MIN	205 MIN	30/22	HARDNESS 80 HRB MAX
*	-	ASTM A 209/Ta	MW	365 MIN	195 MIN	30/22	HARDNESS 81 HRB MAX
*	-	ASTM A 209/T1B	MW	415 MIN	220 MIN	30/22	HARDNESS 77 HRB MAX
*	-	ASTM A 210/A-1	MW	415 MIN	255 MIN	30/22	HARDNESS 79 HRB MAX
*	-	ASTM A 210/C	MW	485 MIN	275 MIN	30/22	HARDNESS 89 HRB MAX
*	-	ASTM A 213/T2	MW	415 MIN	205 MIN	30/22	HARDNESS 85 HRB MAX
*	-	ASTM A 213/T5	MW	415 MIN	205 MIN	30/22	HARDNESS 85 HRB MAX
*	-	ASTM A 213/11	MW	415 MIN	205 MIN	30/22	HARDNESS 85 HRB MAX
*	-	ASTM A 213/T12	MW	415 MIN	205 MIN	30/22	HARDNESS 85 HRB MAX
*	-	ASTM A 213/T-22	MW	415 MIN	240 MIN	30/22	HARDNESS 85 HRB MAX
*	*	ASTM A 333/1	AW	380 MIN	205 MIN	25/20	IMPACTTEST-50F40x10 J14
*	*	ASTM A 333/6	AW	415 MIN	240 MIN	30/18	IMPACTTEST-50F40x10 J14
*	*	ASTM A 334/1	MW	380 MIN	205 MIN	35/28	-50F 40 x 10 J14 85 HRB MAX
*	*	ASTM A 334/6	MW	415 MIN	240 MIN	30/22	-50F 40 x 10 J14 85 HRB MAX
*	-	ASTM A 335/P1	AW	380 MIN	205 MIN	20	-
*	-	ASTM A 335/P-2	AW	380 MIN	205 MIN	20	-
*	-	ASTM A 335/P5	AW	415 MIN	205 MIN	20	-
*	-	ASTM A 335/P11	AW	415 MIN	205 MIN	20	-
*	-	ASTM A 335/P12	AW	415 MIN	205 MIN	20	-
*	-	ASTM A 335/P22	AW	415 MIN	205 MIN	20	-
*	*	BS/3059/1/33		324-441	186 MIN	25	-
*	*	BS/3059/2/33		324-441	186 MIN	21	-
*	-	BS/3059/2/45		441-560	245 MIN	22	-
*	-	BS/3059/2/620		441-618	235 MIN	22	-
*	-	DIN/17175/ST35.8		340-441	235 MIN	25	-
*	-	DIN/17175/ST45.8		441-540	255 MIN	25	-
*	-	DIN/17175/15M03		441-540	284 MIN	21	-
*	-	DIN/17175/13CrM044		441-570	294 MIN	22	-
*	-	DIN/17175/13CrM910		441-570	294 MIN	22	-
*	-	ASTM A 199/T5	MW	415 MIN	170 MIN	30/22	HARDNESS 85 HRB MAX
*	-	ASTM A 199/T11	MW	415 MIN	170 MIN	30/22	HARDNESS 85 HRB MAX
*	-	ASTM A 199/T22	MW	415 MIN	170 MIN	30/22	HARDNESS 85 HRB MAX
*	-	ASTM A 199/T4	MW	415 MIN	170 MIN	30/22	HARDNESS 85 HRB MAX
*	-	ASTM 199/T-7	MW	415 MIN	170 MIN	30/22	HARDNESS 85 HRB MAX
*	-	ASTM A 2000/T5	MW	415 MIN	170 MIN	30/22	HARDNESS 85 HRB MAX
*	-	ASTM A 204/T11	MW	415 MIN	205 MIN	30/22	HARDNESS 85 HRB MAX
*	-	ASTM A 200/T22	MW	415 MIN	205 MIN	30/22	HARDNESS 85 HRB MAX
*	-	ASTM A 200/T4	MW	415 MIN	205 MIN	30/22	HARDNESS 85 HRB MAX
*	-	ASTM A 200T7	MW	415 MIN	170 MIN	30/22	HARDNESS 85 HRB MAX
*	*	ASTM A 199/T9	MW	415 MIN	170 MIN	30/22	HARDNESS 85 HRB MAX
-	-	ASTM A 200/T9	MW	415 MIN	170 MIN	30/22	HARDNESS 85 HRB MAX
-	-	ASTM A 213/T9	MW	415 MIN	170 MIN	30/22	HARDNESS 85 HRB MAX
-	*	ASTM A 335/P9	MW	415 MIN	170 MIN	30/22	-
-	*	ASTM A 178/A	MW	325 MIN	172 MIN	30/22	-