

Material with Electrode selection -Rev 02																	
Number	BASE MATERIAL		P /GROUP Number	ASTM Specification						AWS Specification			Preheat Temp. C° (min)	Post heat Temp. C° (min)	Hardness BHN		
				PIPE	TUBE	WROGHT FITTING	FORGING	CASTING	PLATE	Corred Electrode		Bare Electrode					
										Preferred	Alternate						
1	Carbon Steel	Carbon Steel	1	A53 A106	A178	A234 Gr. WP A/B	A181, A105	A216	A285 A515	E6010 Root E7018	E 6013,E7015 E7028	E70S-2,S-3, S5, RG 60 , 65	< 25mm 10 >25mm 79	>19mm 595-650	-		
2		Carbon Steel(Impact test)		A333 Gr. 1/6	A179/A192	A420 WPL6	A350 LF 1/2	A352 LCB/C	A516	E7018 G	E7018	ER 70S-1B					
3	Low and Intermediate Alloy Steel	C-1/2Mo	3	A335 P1	A161 T1	A234 WP1	A182 F1	A217 WC1	-	E7010-A1 E7018-1	E7015-1	ER 70S-1B	< 16mm 10 >16mm 79	>19mm 595-720	225		
4		1/2 Cr-1/2 Mo		A335 P2	A213 T2	-	A182 F2	-	A387 Gr.2	E8018-B1	E8016-B1	-					
5		1 Cr-1/2 Mo		A335 P12	A213 T12	A234 WP12	A182 F12	-	A387 Gr.12	E6016-B2	E8018-B2	ER515		< 13mm 10 >13mm 121	>12.5mm 705-745	225	
6		1 1/4 Cr 1/2 Mo	A335 P11	A213 T11	A234 WP11	A182 F11	A217 WC6	A387 Gr.11									
7		21/4 Cr-1 Mo	A335 P22	A213T22	A234 WP22	A182 F22	A217 WC9	A387 Gr.22	E9016-B3	E9018-B3	ER90S-B3			>12.5mm 705-745	241		
8		5 Cr-1/2 Mo	A335 P5	A213T5	A234 WP5	A182 F5	A217 C5	A387 Gr.5	E8018-B6	-	ER80S-B6		175	705-760		241	
9		7 Cr-1/2 Mo	A335 P7	A213T7	A234 WP7	A182 F7	-	A387 Gr.7	E8018-B7	-	ER80S-B8						
10		9 Cr-1 Mo	A335 P9	A213T9	A234 WP9	A182 F9	A217 C12	A387 Gr.9	E8018-B8	-	ER80S-B8						
			3Cr-1Mo-0.2V-Cb-Ca	C				A182FF3VCb	A487 Gr.8	A542 A,B,C	E9016-G	-	ER90S-G				
11		Stainless Steel	Martensinc & Ferrite	6	-	A268 TP409	-	-	-	-	E309	E312	ER309	150 Inter pass< 315	730-790	241	
12	11Cr				-	A268 TP410	-	A182 F6	A217 CA15	A240 TP410	E410	-	ER410				
13	12Cr				-	A268 TP405	-	A182 F6	A296 CA15	A240TP405	E309	Eni Cr Fe-3	ER309		10	-	-
14	13Cr				-	A268 TP430	-	-	-	A240 TP430	E430	Eni Cr Fe-3	ER430				
15	17Cr		-	-	-	-	-	-	-	-	-	-					
16	18Cr-8Ni		A312 TP304	A312 TP304	A403 WP304	A182 F304	A351 CF8	A240 TP304L	E308	-	ER308						
17	18Cr-8Ni Low C		A312 TP304L	A312 TP304L	A403 WP304L	A182 F304L	A351 CF3	A240 TP304L	E308L	-	ER308L						
18	18Cr-8Ni High Temp.		A312 TP304H	A312 TP304H	A403 WP305H	A182 F304H	-	-	E16-6-2	E308	ER16-8-2						
19	25 Cr-12Ni		A312 TP308	-	A403 WP309	-	A351 CH20	A240TP309S	E309	E310	ER309						
20	25 Cr-20 Ni		A312 TP310	A312 TP310	A403 WP310	A182 F310	A351 CK20	A240 TP310S	E310	-	ER310						
21	18 Cr-12 Ni-2Mo		A312 TP316	A312 TP316	A403 WP316	A182 F316	A351 CF8M	A240TP314	E316	E16-8-2	ER316						
22	18 Cr-12 Ni-2Mo-Low C		A312 TP316L	A312 TP316L	A403 WP316L	A182 F316L	A351 CF8M	A240 TP316L	E316L	E308 Mo L	ER316L						
23	18 Cr-12 Ni-2Mo-High Temp.		A312 TP316H	A312 TP316H	A403 WP316H	A182 F316H	-	-	E16-8-2	E316	ER16-8-2						
24	18Cr-12Ni-3Mo		A312 TP317	A312 TP317	A403 WP317	-	-	A240 TP317	E317	-	ER317						
25	18Cr-10Ni-Ti	A312 TP321	A312 TP321	A403 WP321	A182 F321	-	A240 TP321	E347	-	ER347							
26	18Cr-10Ni-Ti High Temp	A312 TP321H	A312 TP321H	A403 WP321H	A182 F321H	-	-	E16-6-2	E347	ER16-8-2							
27	18Cr-10Ni-Cb	A312 TP347	A312 TP347	A403 WP347	A182 F347	A351 CF8C	A240 TP 347	E347	-	E347							
28	18Cr-10Ni-Cb High Temp	A312 TP347H	A312 TP347H	A403 WP347H	A182 F347H	-	-	E16-8-2	E347	ER16-8-2							
29	18Cr-10Ni-To	A312 TP348	A312 TP348	A403 WP348	A182 F348	-	A240 TP348	E347L To346	E347	ER348							
30	18Cr-10Ni-To High Temp.	A312 TP348H	A312 TP348H	-	-	-	-	E16-8-2	E347	ER16-8-2							
31	25Cr-20Ni	-	A608 HK40	-	-	A351 HK40	-	E310H	-	ER310H							
32	20Cr-28Ni-2Mo-3Cn	B464	B468	B365 WP20CB	B472	A351 CB7M	B463	E320	E320 LA	ER320							
33	17Cr-4Ni-Ph	-	-	-	A564 TP630	A474CB7Cu1	-	E630	-	ER630							
34	Ni Steel	3 1/2Ni	9	A333 Gr. 3	A334 Gr. 3	A420 WPL6	A350 LF3	A352LC3	A203 Gr.D/E	E8018-C2	E8016-D2	-	95	>19mm595-635	-		
35		9Ni	11	A333 Gr. 8	A334 Gr. 8	A420 WPL8	A522	-	A353	ENiCrFe-3	-	ER Ni Cr-3	10	>19mm 550-585	-		
36	Non Ferrous	9Cr-1Mo-1ve	15	E	A335 P91	A213 T91	A234 WP91	A182 F91	A212 C01	A387 Gr.91	E9018-B9	E9016-B9	ER 90S-B9	175	705-760	241	
37		Alluminium	21		B241	B210, B234	B361 WP3003	B247	-	B209	-	-	ER1100	10	-	-	
38		Copper	31		B42	B75	-	-	-	B11	Ecu	-	ER Cu	10	-	-	
39		70Cu 30Ni Cupernocial	34		B455 C715	B111,C715	-	-	B359 C964	B171	E Cu Ni	-	ER Cu Ni	10	-	-	
40		Alluminium Bronze	35		-	B111,C614	-	B150	B148	B169	E CuAj-A1	8Cu Aj-A2	ER Cu Aj -A2	10	-	-	
41		Nickle	41		B161	B161,B163	B366 WPN	B160	-	B162	E Ni-1	E Ni-3	ER Ni-3	10	-	-	
42		Monel	42		B185	B165,B163	B366 WPNC	B164	-	B127	ENCU-7	E Ni Cu 3-4	ER Ni Cu-7	10	-	-	
43		Inconel	43		B167,8,B517	B516,B183	B366 WPNCI	B166	-	B168	E Ni Cr Fe-1	E Ni Cr Fe-3	ER Ni Cr Fe-5	10	-	-	
44		Hastelloy B	44		B619	B522	B366 WPHB	-	A296 N12M	B333	E Ni Mo-1	-	ER Ni Mo-1	10	-	-	
45		Hastelloy C	44		-	-	B366 WPHC	-	A295 CU12M	B334	E Ni Mo-2	-	ER Ni Mo-2	10	-	-	
46		Incoly	45		B407,B514	B407,B515	B366 WPNIC	B408	-	B409	E Ni Cr Fe-2	-	ER Ni Cr-3	Inter pass<95	10	-	-
47		Titanium	-		B337	B338	B363	B381	B267	B255	-	-	ER Ti-2	10	-	-	
48	Zirconium	-		B658,R02	B523,R02	B853 R02	B493 R C2	-	B551 R02	-	-	ER ZR2	10	-	-		

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