

RECOMMENDED FILLER METALS FOR WELDING THE ASTM STEELS

PREHEAT TEMP:	NOTES:	Below is a list of filler metals that can be used to weld the following ASTM steels but are for general guidance only. Properties and chemical deposits can change based on welding conditions. No attempt has been made to recommend welding procedures since they vary with the process used, metal thickness, carbon content, alloy content and other factors. Preheat temperatures are only suggested ranges for different types of steels. Always verify with your own in-house welding engineer before using suggested filler metals.
A = 250-350°F	Shielded Metal Arc Welding - SMAW	
B = 350-450°F	Gas Metal Arc Welding - GMAW	
C = 500-600°F	Submerged Arc Welding - SAW	
D = 600-800°F	Flux Cored Arc Welding - FCAW	
	Metal cored Arc Welding - MCAW	

ASTM	CLASS OR GRADE	PREHEAT TEMP.	SMAW	GMAW	SAW	FCAW/MCAW
A1-84	All Weights	D	E10018-D2 E309H E312	ER 309H ER309L ER312	EA2	E100T5-D2 E100T1-G
A2-80	All Classes	D	E9018-B3 E312 E10018-D2	ER310 ER312	EA2	E90T1-B3 E91T1-B3 E312Tx-x
A3-87	Grade 1 & 2		E6010 E6011 E6013	ER70S-3 ER70S-6 ER70S-7	EM12K	E70T-1 E71T-1/T-9 E70C-6M
A27-87	All	A	E7018 E7018-1	ER70S-3 ER70S-6 ER70S-7	EM12K	E70T-1 E71T-1/T-9 E70C-6M
A36-88b		A	E6010 E6011 E6013 E7018 E8018-C3	ER70S-3 ER70S-6 ER70S-7	EM12K	E70T-1 E71T-1/T-9 E70C-6M
A47-84	All	C	Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A48-83	All	C	Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A49-87		B	E10018-D2		EF5	E100T5-D2
A53-88a			E6010 E6011 E7018	ER70S-3 ER70S-6 ER70S-7		E70T-1 E71T-1/T-9 E70C-6M
A67-84	Grade 1 Grade 2	A	E8018-C3 E8018-W2 E10018-W2	ER80S-Ni1 ER80SNI2		E81T1-Ni2 E81T1-W2 E100T1-G
A74		B	Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A82-88			E7018	ER70S-3 ER70S-6	EM12K	E70T-1 E71T-1/T-9 E70C-6M
A105-87a		B	E7018	ER70S-6	EM12K	E70T-1 E71T-1/T-9 E70C-6M
A106-88a	Grades A,B,C	A, B, C	E7018	ER70S-6	EM12K	E70T-1 E71T-1/T-9 E70C-6M

A108-81 (1988)	1008-1020 1022-1215		E6010 E7018 E7018	ER70S-3 ER70S-6 ER70S-6	EM12K	E70T-1 E71T-1/T-9 E71T-1/T-9 E70C-6M
A109-88	All	A	E7018	ER70S-3 ER70S-6 ER70S-6	EM12K	E70T-1 E71T-1/T-9 E70C-6M
A123-84			E6010 E6011	ER70S-6		E71T-14 E71T-GS
A126-84			Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A128-86			Stoody Dynamang McKay Hardalloy118			Stoody Dynamang McKay 218-0
A131-88	A thru DS A,B,D,DS,AH32, AH36, DH32/36		E7018 E8018-C3 E8018-C1	ER70S-6 ER80S-Ni1 ER80S-Ni2	EM12K	E71T-1/T-9 E70C-6M E81T1-Ni1 E81T1-Ni2
A134-85			E6010	ER70S-3 ER70S-6	EM12K	E71T-1/T-9 E70C-6M
A135-85	A&B		E7018	ER70S-6		E71T-1/T-9 E70C-6M
A139-88	All		E7018	ER70S-6		E71T-1/T-9 E70C-6M
A148-84	80-40, 80-50 90-60 105-85 115-95 135-125	A B B C	E8018-B2 E8018-C1 E9018-M E10018-D2 E12018-M E4130 E4140	ER80S-D2 ER70S-6 ER4130		E81T1-Ni1 E91T1-K2 E100T5-D2 E110T1-K3 E4130LN
A159-83	All	C	Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A161-88	Low Carbon Grade T-1	A A	E7018 E7018-A1	ER70S-6 ER70S-A1		E71T-1/T-9 E70C-6M E81T1-A1
A167-88	301, 302, 302B,304, 305, 308 304L 309, 309S 309 Cb 310, 301S 316, 316L 317, 317L 321, 347, 348 XM-15		E308H E308L E308L E309 E309L E309Cb E310 E316 E316L E317 E317L E347 E310	ER308 ER308L ER308L ER309 ER309L ER310 ER316 ER316L ER317 ER317L ER347 ER310	ER308 ER308L ER308L ER309 ER309L ER310 ER316 ER316L ER317 ER317L ER347 ER310	E308HTx-x E308LTx-x E308LTx-x E309HTx-x E309LTx-x E309LCbTx-x E316HTx-x E316LTx-x E317LTx-x E347Tx-x
A176-87	403, 405, 409, 410, 410H 442, 446		E410 E410 E309H E310	ER410 ER410 ER309H E310		E410Tx-x E410Tx-x E309HTx-x

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ASTM	CLASS OR GRADE	PREHEAT TEMP.	SMAW	GMAW	SAW	FCAW/MCAW
A178-87	A & C		E7018	ER70S-6		E71T-1/T-9 E70C-6M
A179-88			E6010 E6011 E7018	ER70S-3 ER70S-6	EM12K	E71T-1/T-9 E70C-6M
A181-87	60 & 70		E7018	ER70S-3 ER70S-6	EM12K	E71T-1/T-9 E70C-6M
A182-88	F1 F2, F11, F12 F5, F5a	A B	E7018-A1 E8018-B2 E309L E310 E8018-B6 E410 E309H E310	ER80S-D2 ER80S-B2 ER309L ER310 ER80S-B6 ER410 ER309H ER310	EB2 ER309L ER310 EB6	E81T1-A1 E81T1-B2 E309LTx-x E81T1-B6
	F6A Classes 1 & 2 F21, F22, F22a F429, F430 F304, F304H, F304N F304L, F304LN F310 F316, F316H, F316N F316L, F316LN F317 F317L F321, F321H F347, F347H, F348, F348H	B	E9018-B3 E430 E308H E308L E308L E310 E316H E316L E316L E317L E347 E347	ER90S-B3 ER409CB ER430 ER308 ER308L E308L ER310 ER316 ER316L ER316L ER317L ER347 ER347	EB3 ER308 ER308L ER308L ER310 ER316 ER316L ER316L ER317L ER347 ER347	E91T1-B3 EC409CB E308Tx-x E308LTx-x E308LTx-x E316HTx-x E316LTx-x E316LTx-x E317LTx-x E317LTx-x E347Tx-x E347Tx-x
A192-88			E7018 E7018-A1	ER70S-3 ER70S-6		E71T-1/T-9 E70C-6M
A193-88	B5		E309H E310 8018-B6L E410	ER309H ER310 ER80S-B6 ER410	ER310 EB6 EB6 ER410	E309HTx-x E309LTx-x E81T1-B6 E410Tx-x
	B6, B6X B7, B7M B16 B8, B8A B8C, B8CA, B8T, B8TA B8M, B8MA, B8M2, B8M3	B B	E8018-B2 E9018-B3 E308H E347 E316H E316L	ER80S-B2 ER90S-B3 ER308H ER347 ER316H ER316L	EB2 EB3 ER308H ER347 ER316H ER316L	E81T1-B2 E91T1-B3 E308HTx-x E308LTx-x E347Tx-x E316HTx-x E316LTx-x
A199-88 & A200-88	T-4	B	E9018-B3 E309H E310 E8018-B6	ER90S-B3 ER309H ER310 ER80S-B6	EB3 ER309H ER310 EB6	E91T1-B3 E309HTx-x E309LTx-x E81T1-B6
	T-5		E309H E310	ER309H ER310	ER309H ER310	E309LTx-x
	T-7, T-9 T-11	B	E8018-B2 E309H E310	ER80S-B2 ER309H ER310	EB2 ER309H ER310	E81T1-B2 E309HTx-x E309LTx-x
	T-21 T-22	B	E309H E310 E8018-B6 E9018-B3	ER309H ER310 E8018-B6 ER90S-B3	EB6 EB3	E81T1-B6 E91T1-B3

A202-82 (1988)	A B	B B	E8018-B2 E9018-B3 E10018-D2	ER80S-B2 ER90S-B3	EB2 EB3	E81T1-B2 E91T1-B3
A203-82 (1988)	A, B D, E, F		E8018-C1 E8018-C2	ER80S-Ni2		E81T1-Ni-2
A204-88	A, B C	A A	E7018-A1 E10018-M	ER70S-A1	EA1	E81T1-A1 E100T1-K3
A209-88	All	A	E7018-A1	ER70S-A1	EA1	E81T1-A1
A210-88	All	B	E7018	ER70S-6		E71T-1/T-9 E70C-6M
A211-75 (1985)			E7018	ER70S-6		E71T-1/T-9 E70C-6M
A213-88a	T2, T11, T12, T17 T5, T5B, T5C T7, T9 T21 T22 TP201, TP202, TP304L TP304L TP309Cb TP310Cb TP316, TP316L TP321, 345, 348	B	E8018-B2 E309H E310 E8018-B6 E309H E310 E309H E310 E8018-B6 E9018-B3 E308H E308L E309Cb E310Cb E316H E316L E347	E80S-B2 ER309H ER310 ER80S-B6 ER309H ER310 ER309H ER310 ER80S-B6 ER90S-B3 E308H ER308L	EB2 ER310 EB6 ER310 ER310 EB6 EB3 ER308H ER308L	E81T1-B2 E309HTx-x E309LTx-x E81T1-B6 E309HTx-x E309LTx-x E309HTx-x E309LTx-x E90T5-B3 E81T1-B6 E91T1-B3 E308HTx-x E308LTx-x E308LTx-x
A214-88			E7018	ER70S-6	EM12K	E71T-1/T-9 E70C-6M
A216-84b	WCA WCB WCC	A	E7018 E7018-A1 E9018-M	ER70S-6 ER70S-A1 ER80S-D2	EL12 EM12K	E71T-1/T-9 E70C-6M E81T1-A1 E91T1-K2
A217-87	WC1 WC4, WC5, WC6, WC11 WC9 C5	A B B	7018-A1 E8018-B2 E9018-B3 E309H E310 E8018B6L	ER70S-A1 ER80S-B2 ER90S-B3 ER310 ER80S-B6	ER310	E81T1-A1 E81T1-B2 E91T1-B3 E309LTx-x E81T1-B6
A220-88	All		Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A225-86	Grade C Grade D		E11018-M E10018-M	ER110S-1 ER100S-1		E110T1-K3 E100T1-K3
A226-88			E7018	ER70S-6		E71T-1/T-9 E70C-6M

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ASTM	CLASS OR GRADE	PREHEAT TEMP.	SMAW	GMAW	SAW	FCAW/MCAW
A234-88b	WPB, WPC WP1 WP11, WP12 WP22 WP5 WPR	A B B	E7018 E7018-A1 E8018-B2 E9018-B3 E309H E310 E8018-B6 E8018-W2	ER70S-6 ER80S-D2 ER80S-B2 ER90S-B3 ER309H ER310 ER80S-B6	EB2 EB3 ER310 EB6	E71T-1/T-9 E70C-6M E81T1-A1 E81T1-B2 E91T1-B3 E309LTx-x E81T1-B6 E81T1-W2
A240-88c	201, 202, 302, 304, 305 309S 309Cb 310S 310Cb 316 316L 317 321, 347, 348 410 430		E308H E308L E309 E309Cb E310 E310Cb E316 E316L E317 E347 E410	ER308 ER308L ER309 ER310 ER316 ER316L ER317 ER347 ER410		E308HTx-x E308LTx-x E309HTx-x E316HTx-x E316LTx-x E317LTx-x E347Tx-x E410Tx-x
A242-88	All 2" Up	A	E8018-C2 E8018-W2	ER80S-G	EM12K	81T1-W2
A249-88a	201, 202, 304, 305 304L 309Cb 310Cb 316 316L 317 317L 321, 347, 348		E308H E308L E309Cb E310Cb E316H E316L E317L E347	ER308H ER308L ER316H ER316L ER317L ER347	ER308 ER308L ER308L ER316H ER316L ER317L ER347	E308Tx-x E308LTx-x E308LTx-x E316HTx-x E316LTx-x E317LTx-x E317LTx-x E347Tx-x
A250-88a	T1, T1a, T1b T2 T-11 T-22	A B B B	E7018-A1 E8018-B2 E8018-B2 E89019-B3	ER70S-A1 ER80S-B2 ER80S-B2 ER90S-B3	EB2 EB2 EB3	E81T1-A1 E81T1-B2 E81T1-B2 E81T1-B3
A252-88	All		E7018 E7018-1	ER70S-3 ER70S-6 ER70S-7	EM12K	E70T-1 E71T-1/T-9 E70C-6M
A266-88	1 2, 4, 3		E7018 E8018-B2	ER70S-6 ER80S-B2	EB2	E70T-1 E71T-1/T-9 E70C-6M E81T1-Ni1

A268-88a	TP405, TP410 TP430		E410	ER410		E410Tx-x
A269-88	304 304L 316 316L 321, 347, 348		E308H E308L E316H E316L E347	ER308H ER308L ER316H ER316L ER347	ER308 ER308L ER308L ER316 ER316L ER316L ER347	E308HTx-x E308LTx-x E308LTx-x E316HTx-x E316LTx-x E316LTx-x E347Tx-x
A270-88a	TP304 TP304L TP316 TP316L		E308H E308L E316H E316L	ER308H ER308L ER316H ER316L	ER308 ER308L ER308L ER316 ER316L ER316L	E308HTx-x E308LTx-x E308LTx-x E316HTx-x E316LTx-x E316LTx-x
A271-88	TP304 TP304H TP316 TP316H TP321, 347		E308H E308H E316H E316H E347	ER308H ER308H ER316H ER316H ER347	ER308H ER308L ER308H ER316H ER316L ER316H ER347	E308HTx-x E308LTx-x E308HTx-x E316HTx-x E316LTx-x E316HTx-x E347Tx-x
A276-89	201, 202, 302, 304, 308 304L, 305 309 309Cb 310 310Cb 316 316L 317 321, 347, 348 403, 405, 410, 414, 421 446		E308H E308L E309H E309Cb E310 E310Cb E316H E316L E317 E347 E410 309H E310	ER308H ER308L ER309H ER310 ER310Cb ER316H ER316L ER317 ER347 ER410 ER309H ER310	ER308H ER308L ER309H ER310 ER310 ER316H ER316L ER317 ER347 ER410 ER309H ER310	E308HTx-x E308LTx-x E308LTx-x E309HTx-x E309LTx-x ER310 ER310 E316HTx-x E316LTx-x E317LTx-x E347Tx-x E410Tx-x E309HTx-x
A278-85	All		Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A283-87	Grades A, B, C Grade D		E6010 E7018 E7018	ER70S-3 ER70S-6		E70T-1 E71T-1/T-9 E70C-6M E70T-1 E71T-1/T-9 E70C-6M
A284-88	Grades C & D		E6010 E6011 E6013 E7014 E7018 E7024	ER70S-3		E70T-1 E71T-1/T-9 E70C-6M
A285-85 (1987)	Grades A, B, C		E7018	ER70S-3 ER70S-6		E70T-1 E71T-1/T-9 E70C-6M

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ASTM	CLASS OR GRADE	PREHEAT TEMP.	SMAW	GMAW	SAW	FCAW/MCAW
A288-77 (1982)	Grade 1	A	E7018 E8018-C3	ER70S-3 ER70S-6	EB2 EB3	E70T-1 E71T-1/T-9 E70C-6M E81T1-B2 E91T1-B3
	Grade 2	A	E8018-B2 E9018-B3	ER90S-B2 ER90S-B3		E110T5-K4 E110T1-K3 E110T1-G
	Grade 3	A	E11018-M	ER120S-1	EB6	E81T1-B6 E4130LN E81T1-B6
	Grade 4 Grade 5, 6, 7, 8	A C	E12018-M E8018-B6 E4130 E8018-B6	ER80S-B6 ER4130		
A289-88	Class B & C		E310	ER310		
A290-85	A, B		E7018	ER70S-6	EB2	E70T-1 E71T-1/T-9 E70C-6M E81T1-B2 E100T1-K3 E110T1-K3
	C, D	A	E8018-B2	ER80S-B2		EB6
	E, F	A	E11018-M	ER120S-1		
	G, H	A	E12018-M			
	I, J	A	E8018-B6	ER80S-B6		
K, L	A	E310	ER310			
A291-84	1	A	E8018-C3	ER80S-Ni1 ER80S-Ni2	EB6	E81T1-Ni1 E100T5-D2 E110T1-K3 E81T1-B6
	2, 3	A	E10018-D2			
	4		E11018-M	ER120S-1		
	5, 6, 7		E8018-B6	ER80S-B6		
A297-84	HF		E308H	ER308H		E308HTx-x E308LTx-x
	HH		E309H	ER309H		E309HTx-x E309LTx-x
	HI, HK		E310	ER310		E312Tx-x
	HE, HD		E312	ER312		
	HT, HU					
A299-82 (1987)		B	E7018-A1 E7018 E8018-B2	ER80S-D2		E70T-1 E71T-1/T-9 E70C-6M E81T1-B2
A302-82 (1987)	A	A	E7018-A1	ER70S-6 ER80S-D2		E81T1-A1
	B	A	E8018-NM1	ER80S-D2		E81T1-Ni1
	C & D	A	E9018-M	ER80S-D2		E81T1-Ni1
A307-88a	A		E7018-1	ER70S-3 ER70S-6		E70T-1 E71T-1/T-9 E70C-6M
A311-86	1018	A	E7018-1	ER70S-6		E71T-1/T-9 E70C-6M
	1035	B	E7018-1	ER70S-6		E71T-1/T-9 E70C-6M
	1045, 1050	C	E7018-1	ER70S-6		E71T-1/T-9 E70C-6M
	All Others		10018-D2			E100T5-D2

A312-88a	TP304, 304N TP304H TP304L, 304LN TP309Cb TP309S, 309H TP310Cb TP316, 316H TP316L TP317 TP317L TP321 347 348 321H 347H, 348H		E308H E308L E309CB E309H E310CB E316H E316L E317L E347 E347	ER308H ER308L ER309H ER316H ER316L ER317L ER347 ER347	ER308H ER308L ER309H ER316H ER316L ER317L ER347 ER347	E308HTx-x E308LTx-x E309HTx-x E316HTx-x E316LTx-x E317LTx-x E347Tx-x E347Tx-x
A314-87a	202 302 302B 303 304, 305, 308 309, 309S 309Cb 310, 310S, 314 316 316L 317 321, 347, 348 429, 430, 431 403, 410, 414, 416, 416SE, 420 440A, 440B, 440C 501, 502		E308H E308H E309H E309L E309CB E310 E316H E316L E317 E347 E410 E410 E309H E310 E309H E310 E8018-B6	ER308H ER308H ER309H ER309L ER310 ER316H ER316L ER347 ER410 ER410 ER309H ER310 ER309H ER310 ER80S-B6	ER308H ER308H ER309H ER309L ER310 ER316H ER316L ER347 ER310 ER310	E308HTx-x E308HTx-x E308LTx-x E309HTx-x E309LTx-x E316HTx-x E316LTx-x E317LTx-x E347Tx-x E309LTx-x E309LTx-x E309LTx-x E81T1-B6 E309LTx-x E81T1-B6
A319-71 (1985)			Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A321-81 (1988)		C	E9018-M E10018-D2 E10018-M	ER80S-D2 ER100S-1		E110T5-K4
A325-88a	Type I Type II	A A	E7018 E12018-M	ER70S3 ER70S-6		E70T-1 E71T-1/T-9 E70C-6M E110T1-K3
A328-88a	Plates, Bars, Shapes		E6011 E6013 E7014 E7024	ER70S-3 ER70S-6		E70T-1 E71T-1/T-9 E70C-6M
A333-88a	Grade 1 & 6 Grade 3 & 7 Grade 4		E7018 E6010 E8018-C2 E8018-W2	ER70S-3 ER70S-6 ER80S-G		E70T-1 E71T-1/T-9 E70C-6M E81T1-Ni2 E81T1-W2

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ASTM	CLASS OR GRADE	PREHEAT TEMP.	SMAW	GMAW	SAW	FCAW/MCAW
A334-88	Grade 1 & 6		E7018 E6010	ER70S-3 ER70S-6		E70T-1 E71T-1/T-9 E70C-6M E81T1-Ni2
	Grade 3 & 7		E8018-C2			
A335-88a	P1 & P15	A	E7018-A1	ER80S-D2		E81T1-A1
	P2, P11, P12	B	E8018-B2	ER80S-B2	EB2	E81T1-B2
	P5, P5b, P5c		E309H E310	ER309H ER310	EB6	E309LTx-x E81T1-B6
	P21, P22	B	E8018-B6 E9018-B3	ER80S-B6 ER90S-B3	EB3	E91T1-B3
A336-88a	F1	A	E7018-A1	ER80S-D2		E81T1-A1
	F5, F5A		E309H E310	ER310 ER80S-B6	ER310 EB6	E81T1-B6
			E8018-B6			
	F6	B	E410 E309H E310	ER410 ER310	ER310	E309Tx-x
	F21, F21A, F22, F22A		E9018-B3	ER90S-B3	EB3	E91T-B3
	F11, F11A, F11B, F12	B	E8018-B2 (L)	ER80S-B2	EB2	E81T1-B2
	F304, 304H, 304N		E308H	ER308H	ER308H	E308HTx-x
	F304L, 304LN		E308L	ER308L	ER308L	E308LTx-x E308LTx-x
	F309H		E309H	ER309H	ER309H	E309HTx-x
	F310		E310	ER310	ER310	
	F316		E316H	ER316H	ER316H	E316HTx-x E316LTx-x
F316L		E316L	ER316L	ER316L	E316LTx-x	
F316H		E316	ER316H	ER316H	E316HTx-x	
F321, 347, 348		E347	ER347	ER347	E347Tx-x	
A338-84			Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A350-87a	LF1, LF2, LF5, LF6	A	E8018-C3	ER80S-Ni1 ER80S-Ni2		E81T1Ni-1 E81T1-Ni2
	LF3		E8018-C2			
	LF6		E8018-C3	ER80S-Ni1 ER80S-Ni2		E80T5-Ni2
A351-88	CF8, CF8A, CF8C, CF10		E308H	ER308H	ER308H	E308HTx-x E308LTx-x
	CF3, CF3A		E308L	ER308L	ER308L	E308LTx-x
	CH8, CH10, CH20		E309H	ER309H	ER309H	E309HTx-x
	CF8M, CF10M		E316H	ER316H	ER316H	E316HTx-x E316LTx-x
	CK20, HK30, HK40		E310	ER310	ER310	
	CN7M		E320 E320LR	ER320LR	ER320LR	

A352-88	LCA, LCB LCC LC1 LC2 LC2-1 LC3 CA6NM	A A	E7018 E8018-C3 E7018-A1 E8018-C1 E12018-M E8018-C2 E410NiMo	ER70S-3 ER7S0-6 ER80S-Ni1 ER80SNI2 ER80S-D2 ER80S-Ni2		E70T-1 E81T1-A1 E81T1-Ni2 E110T5-K4 E410NiMoT1-1/4
A353-87			ENiCrMo-6	ER310		E309LTx-x
A356-84	Grade 1 Grade 2 Grade 5,6,8,9 Grade 10 CA6NM	A B B B	E7018 E7018-A1 E8018-B2 E9018-B3 E410NiMo	ER70S-3 ER70S-6 ER80S-D2 ER80S-B2 ER90S-B3 ER410NiMo		E70T-1 E71T-1/T-9 E71-T1/T9 E81T1-A1 E81T1-B2 E91T1-B3 E410NiMoT1-1/4
A358-88a	304, 304LN 304, 340LN 304H 309 309Cb 310 310Cb 316, 316N 316, 316LN 316H 321, 347, 348		E308H E308L E308H E309H E309Cb E310 E310Cb E316H E316L E316H E347	ER308H ER308L ER308LSi ER308H ER309H ER310 ER316H ER316L ER316LSi ER316H ER347	ER308H ER308L ER308H ER309H ER310 ER316H ER316L ER316H ER347	E308HTx-x E308LTx-x E308HTx-x E308LTx-x E308HTx-x E309HTx-x E316HTx-x E316LTx-x E316LTx-x E316HTx-x E347Tx-x
A361-85			E6010 E7018	ER70S-6		E71T-14
A366-85			E6010 E7018	ER70S-3 ER70S-6		E71T-1/T-9 E70C-6M
A369-88	FPA, FPB FP1 FP2, FP11, FP12 FP21, FP22 FP5, FP7, FP9	A A A A	E7018 E7018-A1 E8018-B2 E9018-B3 E309H E310 E8018-B6 (L)	ER70S-6 ER80S-D2 ER80S-B2 ER90S-B3 ER309H ER310 ER80S-B6	EB2 EB3 EB6	E71T-1/T-9 E70C-6M E71T-1/T-9 E70C-6M E81T1-A1 E81T1-B2 E91T1-B3 E309HTx-x E81T1-B6
A372-87a	Type I Type II Type III, VA Type IV, VI Type VII, VIII	A A C	E7018 E7018-A1 E9018-B3 E11018-M E4130	ER70S-3 ER70S-6 ER80S-D2 ER90S-B3 ER120S-1 ER4130		E71T-1/T-9 E70C-6M E81T1-A1 E100T1-K3 E309HTx-x E309LTx-x E81T1-B6

RECOMMENDED FILLER METALS

ASTM	CLASS OR GRADE	PREHEAT TEMP.	SMAW	GMAW	SAW	FCAW/MCAW
A376-88	TP304, TP304N TP304H TP304LN TP316, TP316N TP316LN TP316H TP321, TP321H, TP347, TP347H		E308H E308H E308L E316H E316L E316H E347	ER308H ER308L ER308H ER308LSi ER316H ER316L ER316LSi ER316H ER347	ER308H ER308L ER308H ER316H ER316L ER316H ER347	E308HTx-x E308LTx-x E308HTx-x E308LTx-x E316HTx-x E316LTx-x E316LTx-x E316HTx-x E347Tx-x
A377-84			Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A381-88	Y35 thru Y50 Y52 thru Y60 Y65		E6010 E6011 E7014 E7018 E7018 E8018-C3	ER70S-3 ER70S-3 ER70S-6 ER80S-Ni1 ER80SNI2		E70T-1 E71T-1/T-9 E70C-6M E70T-1 E71T-1/T-9 E70C-6M E81T1-Ni1
A387-87	Grade 2, 12, 11 Grade 22, 21 Grade 5, 7, 9	A B B	E8018-B2 E9018-B3 E8018-B6 (L)	ER80S-B2 ER90S-B3 ER80S-B6	EB2 EB3 EB6	E81T1-B2 E91T1-B3 E81T1-B6
A389-86	C-23 C-24	A B	E8018-B2 E9018-B3	ER80S-B2 ER90S-B3	EB2 EB3	E81T1-B2 E91T1-B3
A391-86	All		E10018-M	ER100S-1		E100T1-K3
A395-88			Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A403-88	WP/CR 304, 304N WP/CR 304L, 304LN WP/CR 304H WP/CR 309 WP/CR 316, 316N WP/CR 316L, 316LN WP/CR 316H WP/CR 317 WP/CR 317L WP/CR 321, 347		E308H E308L E308H E309H E316H E316L E316H E317 E317L E347	ER308H ER308L ER308LSi ER308H ER309H ER316H ER316L ER316H ER317 ER317L ER347	ER308H ER308L ER308H ER309H ER316H ER316L ER316H ER317 ER317L ER347	E308HTx-x E308LTx-x E308LTx-x E308HTx-x E309HTx-x E316HTx-x E316LTx-x E316HTx-x E317LTx-x E317LTx-x E347Tx-x
A405-88	P24	A	E8018-B2	ER80S-B2	EB2	E81T1-B2

A409-88a	TP304 TP304L TP309S TP309Cb TP310S TP310Cb TP316 TP316L TP317 TP321, 347, 348		E308H E308L E309H E309Cb E310 E310Cb E316H E316L E317 E347	ER308H ER308L ER308LSi ER309H ER309L ER310 ER316H ER316LSi ER317 ER347	ER308H ER308L ER309H ER310 ER316H ER316L ER317 ER347	E308HTx-x E308LTx-x E308LTx-x E309HTx-x E309LTx-x E316HTx-x E316LTx-x E317LTx-x E347Tx-x
A414-88	Grade A, B, C Grade D, E, F, G		E6012 E6013 E7018	ER70S-3 ER70S-6		E70T-1 E71T-1/T-9 E70T-1 E71T-1/T-9 E70C-6M
A420-88	WPL6 WPL9 WPL3 WPL8		E7018 E8018-C1 E8018-C2 ENiCrMo-6	ER70S-3 ER80S-Ni2		E70T-1 E71T-1/T-9 E70C-6M E81T1-Ni2
A423-86	Grade 1 Grade 2		E8018-B2 E8018-C3	ER80S-B2 ER80S-Ni1	EB2	E81T1-B2 E81T1-Ni1
A424-80			E7018	ER70S-2 ER70S-6		E70T-1 E71T-1/T-9 E70C-6M
A426-80	CP1, CP15 CP2, CP11, CP12 CP5, CP5b, CP21 CP7, CP9 CP22	A A B	E7018-A1 E8018-B2 E309H E8018-B6 E309H E9018-B3	ER80S-D2 ER80S-B2 ER309H ER80S-B6 ER309H ER90S-B3	EB2 ER309H EB6 ER309H EB3	E81T1-A1 E81T1-B2 E309HTx-x E81T1-B6 E309HTx-x E309LTx-x E91T1-B3
A430-88	FP304, 304H, 304N FP316, 316H, 316N FP321, 321H, 347		E308H E316H E347	ER308H ER308L ER316H ER316L ER347	ER308H ER316H ER347	E308HTx-x E308LTx-x E316HTx-x E316LTx-x E347Tx-x

RECOMMENDED FILLER METALS

ASTM	CLASS OR GRADE	PREHEAT TEMP.	SMAW	GMAW	SAW	FCAW/MCAW
A434-81 (1988)	BB (4130, 8630) (4140)	C	E4130 E4140LN E4140 E4340	ER4130 ER4140		E4130LN
	BC (4130, 8630) (4140) (4340, 4330)	C	E4130 E4140LN E4140 E4340 E4340	ER4130 ER4140		E4130LN
	BD (4130) (4140) (4330, 4340)	C	E4130 E4140LN E4140 E4340 E4340	ER4130 ER4140		E4130LN
A439-83	All		Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A442-86a	Grade 55		E7018	ER70S-6	EM12K	E70T-1 E71T-1/T-9 E70C-6M
	Grade 65		E8018-C3	ER70S-6		E70T-1 E71T-1/T-9 E70C-6M
A444-88			E6010	ER70S-3		E71T-14
A446-87			E6010	ER70S-3		E71T-14
A447-87			E309H	ER309H ER309L	ER309H	E309HTx-x E309LTx-x
A451-80 (1985)	CPF3, CPF3A		E308L	ER308LSi	ER308LSi	E308LTx-x
	CPF8, CPF8A		E308H	ER308H ER308L	ER308H ER308L	E308HTx-x E308LTx-x
	CPF3M		E316L	ER316L	ER316L	E316LTx-x
	CPF8M		E316H	ER316H ER316L	ER316H ER316L	E316HTx-x E316LTx-x
A451-80 (1985)	CPF10MC					
	CPF8C		E347	ER347	ER347	E347Tx-x
	CPH8, CPH20 CPK20		E309H E310	ER309H ER309L ER310	ER309H ER309L ER310	E309HTx-x E309LTx-x
A452-88	TP304H		E308H	ER308H ER308L	ER308H ER308L	E308HTx-x E308LTx-x
	TP347H		E347	ER347	ER347	E347Tx-x
	TP316H		E316H	ER316H ER316L	ER316H ER316L	E316HTx-x E316LTx-x
A455-82 (1987)			E7018 E8018-C3	ER70S-6		E70T-1 E71T-1/T-9 E70C-6M
A457-82						
A458-88						
A463-88			E6010	ER70S-3		E71T-14
A469-87a	Class 1		E7018	ER70S-3 ER70S-6		E70T-12 E71T-12
	Class 2		E8018-C3 E8018-C2	ER70S-6 ER80S-Ni2		E81T1-Ni1 E81T1-Ni2
	Class 3		E9018-M	ER80S-D2		
	Class 4		E10018-D2			E100T1-K3
	Class 5, 6, 7		E11018-M	ER120S-1		E110T1-K3 E110T5-K4

A470-84	1 2 3&5 4, 6, 7, 8	B B	E7018 E8018-C1 E9018-M E11018-M	ER70S-6 ER80S-Ni1 ER80SNI2 ER100S-1 ER120S-1		E70T-12 E71T-12 ER80S-Ni1 ER80SNI2 E100T1-K3 E110T1-K3
A471-87a	10	C	E4130 E4140LN (with heat treatment)			E4130LN
A473-87	201, 202, 205, 302, 302B, 304, 305, 308 303 304L 309, 309S 310, 310S, 314 316 316L 317 321, 347, 348 403, 405, 410, 410S, 414, 416, 420 429, 430, 431 440A, 440B, 440C 501, 501A, 501B		E308H E308H E308H E312 E308L E309H E310 E316H E316L E317 E347 E410 E410 E312 E309H E310 E8018-B6 (L)	ER308H ER308H ER308H ER308L ER312 ER308L ER309H ER310 ER316H ER316L ER317 ER347 ER410 ER410 ER309H ER310 ER80S-B6	ER308H ER308H ER308H ER308L ER308L ER309H ER310 ER316H ER316L ER317 ER347 ER410 ER410 ER309H ER310 ER80S-B6	E308HTx-x E308LTx-x E308HTx-x E308HTx-x E308LTx-x E308LTx-x E309HTx-x E310Tx-x E316HTx-x E316LTx-x E317LTx-x E347Tx-x E410Tx-x E410Tx-x E309HTx-x E81T1-B6
A476-84			Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A477-81	651		E318			
A478-82	302, 304, 305 304L 309Cb 310Cb 316 316L 317		E308H E308L E309Cb E310Cb E316H E316L E317	ER308H ER308L ER308LSi ER316H ER316L ER316LSi	ER308H ER308L ER308L ER316H ER316L ER316L	E308HTx-x E308LTx-x E316HTx-x E316LTx-x

RECOMMENDED FILLER METALS

ASTM	CLASS OR GRADE	PREHEAT TEMP.	SMAW	GMAW	SAW	FCAW/MCAW
A479-88a	302, 304, 304H 304, 304LN 309S 309Cb 310S 310Cb 316, 316N 316L, 316LN 321, 321H, 347, 348 403, 410, 414, 405 430		E308H E308L E309H E309Cb E310 E310Cb E316H E316L E347 E410	ER308H ER308L ER309H ER310 ER316H ER316L ER347 ER410	ER308H ER308L ER309H ER310 ER316H ER316L ER347 ER410	E308HTx-x E308LTx-x E308LTx-x E309HTx-x E310Tx-x E316HTx-x E316LTx-x E316LTx-x E347Tx-x E410Tx-x
A487-88	11A, 12A, 16A 1A, 1B, 1C, 2A, 2B, 2C, 4A, 4C, 8A, 9A, 9C, 13A 4B, 4D, 4E, 8B, 8C, 9B, 9D, 10A, 11B, 12B, 13B 6A, 6B, 7A, 14A	B C	E8018-C3 E9018-M E9018-M E11018-M E11018-M E12018-M	ER100S-1 ER80S-Ni1 ER120S-1 ER120S-1		E81T1-Ni1 E91T1-K3 E91T1-K3 E100T1-K3 E100T1-K3 E4130LN
A493-88	302, 304, 305 316 384 429, 430 410, 431 440C		E308H E316H E309H E410 E312	ER308H ER308L ER316LSi ER309LSi ER410 ER312		E308HTx-x E308LTx-x E316LTx-x E309LTx-x E312Tx-x
A494-87a	M-35-1, M-25S		ENiCu-7 (FM190)	ERNiCu-7 (FM60)	ERNiCu-7	
A496-85			E8018-C1	ER70S-6		E71T-1/T-9 E70C-6M
A497-86			E8018-C1	ER70S-6		E71T-1/T-9 E70C-6M
A499-81	Grade 50 Grade 60		E8018-C3 E8018-C2	ER70S-6 ER80S-D2		E71T-1/T-9 E70C-6M E90T1-D1 E91T1-D1
A500-84	All 1" Up	A	E6010 E7018	ER70S3		E71T-1/T-9 E70C-6M
A501-88	All		E6010 E7018	ER70S3	EL12	E71T-1/T-9 E70C-6M
A508-88a	1, 1a, 2, 3 2a, 3a, 4b 1" Up 4, 5 4a, 5a	A C	E9018-M E10018-M E11018M E12018-M	ER80S-D2 ER120S-1		E100T1-K3 E110T5-K4 E110T1-K3 E4130LN (with heat treatment)

A511-88a	MT302, MT304, MT305 MT309S MT310S MT316 MT316L MT317 MT321, MT347 MT403, MT410, MT414, MT416SE MT431 MT440A MT405 MT429, MT430 MT446-1, MT446-2		E308H E309H E310 E316H E316L E317 E347 E410 E410 E312 E410NiMo E309H E310	ER308H ER308L ER309H ER309L ER310 ER316H ER316L ER316LSi ER317L ER347 ER410 ER410 ER312 ER410NiMo ER309H ER310	ER308L ER309L ER316L ER316L ER317L ER347 ER410 ER410 ER410NiMo ER309H ER310	E308HTx-x E308LTx-x E309HTx-x E309LTx-x E316HTx-x E316LTx-x E316LTx-x E317LTx-x E347Tx-x E410Tx-x E410Tx-x E410NiMoTx-x E309HTx-x E309LTx-x
A512-86	All except 1110, 1115, 1117		E6010 E7018	ER70S-3		E71T-1/T-9 E70C-6M
A513-88	1008 thru 1015 1016 thru 1035 4130, 8630 4140	A (1035) C C	E6010 E7018 E6010 E7018 E4130 E4140	ER70S-3 ER70-6 ER70S-3 ER70-6 ER4130 ER4140		E71T-1/T-9 E70C-6M E71T-1/T-9 E70C-6M E4130LN
A514-88	All	A	E12018-M	ER120S-1		E110T1-K3
A515-82 (1987)	All	A	E7018	ER70S-3	EM12K	E71T-1/T-9 E70C-6M
A516-86	All	A	E7018	ER70S-3	EM12K	E71T-1/T-9 E70C-6M
A517-87a	All	A	E12018-M	ER120S-1		E110T1-K3
A521-76	CA, CC, CC1 CE, CF, AA, AB AC, AD, CF1, CG AE AF	A	E6010 E7018 E7018 E8018-C1 E10018-D2 E11018-M	ER70S-3 ER70S-6 ER80S-D2		E71T-1/T-9 E70C-6M E71T-1/T-9 E70C-6M E100T1-K3 E110T1-K3
A522-87	All		ENiCrMo-6			
A523-88	A & B		E6010 E7018	ER70S-3		E71T-1/T-9 E70C-6M
A524-88	I & II		E6010 E7018	ER70S-3		E71T-1/T-9 E70C-6M
A526-85			E6010 E7018	ER70S-3		E71T-1/T-9 E70C-6M
A527-85			E6010 E7018	ER70S-3		E71T-1/T-9 E70C-6M
A528-85			E6010 E7018	ER70S-3		E71T-1/T-9 E70C-6M
A529-88			E6010 E7018	ER70S-3	EM12K	E71T-1/T-9 E70C-6M

RECOMMENDED FILLER METALS

ASTM	CLASS OR GRADE	PREHEAT TEMP.	SMAW	GMAW	SAW	FCAW/MCAW
A533-87	Type A1 Type B1, B2, C1, C2, D1, D2 Type A3, B3, C3, D3	A	E7018-A1 E8018-NM1 E12018-M	ER80S-D2 ER100S-1		E81T1-A1 E100T1-K3
A536-84	60-40-18, 65-45-12, 60-42-10, 70-50-05		Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A537-86	Class 1 Class 2	A A	E7018 E8018-C3 E8018-C1	ER70S-3 ER70S-6 ER80S-D2		E71T-1/T-9 E70C-6M E81T1-Ni1
A539-88			E6010	ER70S-3		E71T-1/T-9 E70C-6M
A541-88	1, 1A 2, 3, 4 3V, 22B 2A, 3A, 7B 22C, 7, 8 22D, 7A, 8A	B	E7018 E8018-C3 E9018-B3 E10018-M E11018-M E12018-M	ER70S-6 ER80S-Ni1 ER80S-Ni2 ER90S-B3 ER120S-1		E71T-1/T-9 E70C-6M E81T1-Ni1 E91T1-B3 E100T1-K3 E110T1-K3 E110T5-K4
A542-88	1A, 1B, 3A, 3B, 4A, 4B, 4aA, 4aB 2A, 2B	B B	E9018-B3	ER90S-B3	EB3	E91T1-B3 E91T1-B3
A543-87	1B, 1C, 3B, 3C 2B, 2C	A	E11018-M E12018-M	ER120S-1		E110T5-K4 E110T1-K3 E110T1-K3
A553-87b	Type 1		ENiCrMo-6			
A554-88a	MT301, MT302, MT304, MT305 MT309S MT309S-Cb MT310S MT316 MT316L MT317 MT330 MT321, MT347 MT403, MT410, MT414, MT416SE MT431 MT440A MT405 MT429, MT430 MT446-1, MT446-2		E308H E309H E309Cb E310 E316H E316L E317 E330 E347 E410 E410 E312 E410NiMo	ER308H ER309H ER310 ER316H ER316L ER317 ER330 ER347 ER410 ER410 ER312 ER41NiMo	ER308H ER309H ER310 ER316H ER316L ER317 ER330 ER347 ER410 ER410 ER312 ER41NiMo	E308HTx-x E308LTx-x E309HTx-x E310Tx-x E316HTx-x E316LTx-x E316LTx-x E317Tx-x E347Tx-x E410Tx-x E410Tx-x E410NiMoTx-x
A556-88	A2		E6010	ER70S-3 ER70S-6		E71T-1/T-9 E70C-6M

A557-88	B2, C2		E7018	ER70S-3 ER70S-6		E71T-1/T-9 E70C-6M
A562-82			E7018	ER70S-3 ER70S-6		E71T-1/T-9 E70C-6M
A568-88a	All		E6010 E6011 E6012 E6013 E7018	ER70S-3 ER70S-6	EL12 EM12K	E71T-1/T-9 E70C-6M
A569-85	All		E6010 E6011 E6012 E6013 E7018	ER70S-3 ER70S-6	EL12 EM12K	E71T-1/T-9 E70C-6M
A570-88	All		E6010 E6011 E6012 E6013 E7018	ER70S-3 ER70S-6	EL12 EM12K	E71T-1/T-9 E70C-6M
A571-84			Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A572-82	42, 50, 60 65	A	E7018 E8018-C3	ER70S-3 ER70S-6 ER80S-Ni1	EM12K	E71T-1/T-9 E70C-6M E81T1-Ni1 E81T1-Ni2
A573-88	58		E7018	ER70S-6		E70T-5J E 71T-5J E71T-12
	70, 65	A	E8018-C3	ER70S-6 ER80S-Ni1	EM12K	E81T1-Ni1 E81T1-Ni2
A575-86a	M1008 thru M1025 M1031 & M1044	B	E6010 E7018 E8018-C3	ER70S-3 ER70S-6 ER80S-Ni1		E71T-1/T-9 E70C-6M E81T1-Ni1 E81T1-Ni2
A576-87a	1008 thru 1029 1030 thru 1040 1042 thru 1055 1060 1070, 1078	B B C	E6010 E7018 E7018 E8018-C3 E10018-D2 E11018-M	ER70S-3 ER70S-6 ER80S-D2 ER120S-1		E71T-1/T-9 E70C-6M E71T-1/T-9 E70C-6M E81T1-Ni1 E81T1-Ni2 E80C-G E110T1-K3 E110T5-K4
A581-88	303, 303SE		E308H	ER308H ER308L		E308LTx-x
A582-88	416, 416SE 430, 430F		E410 E312	ER410 ER312 ER430		E312Tx-x E410Tx-x
A587-88			Any E60xx	ER70S-3		E71T-1/T-9 E70C-6M
A588-88a	All	A	E8018-W2	ER80S-G		E81T1-W2
A589-88	A & B		E6010 E6011	ER70S-3		E71T-1/T-9 E70C-6M
A591-77			E6010	ER70S-3		E70T-14 E71T-14
A592-85	A, E, F	A (1/2" +)	E11018-M	ER120S-1		E110T1-K3 E110T5-K4
A595-88	A, B, C		E7018	ER70S-3 ER70S-6	EM12K	E71T-1/T-9 E70C-6M
A602-70 (1987)	All		Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A606-85	All		E8018-W2	ER80S-G		E81T1-W2
A607-85	45, 50 55, 60 65, 70	A	E6010 E6011 E7018 E8018-C3	ER70S-3 ER70S-3 ER70S-6 ER80S-Ni1 ER80SNI2		E71T-1/T-9 E70C-6M E71T-1/T-9 E70C-6M E81T1-Ni1 E81T1-Ni2

RECOMMENDED FILLER METALS

RECOMMENDED FILLER METALS

ASTM	CLASS OR GRADE	PREHEAT TEMP.	SMAW	GMAW	SAW	FCAW/MCAW
A608-88	HC30, HD50 HE35 HF30 HH30, HH33, HI35, HK30, HK30, HK40 HL30, HL40		E312 E347 E309H E310	ER312 ER347 ER309H ER309L ER310		E312Tx-x E347Tx-x E309HTx-x E309LTx-x E310Tx-x
A611-85	A, B, C, D E All Grades (IF COPPER IS SPECIFIED, USE)		E6010 E6011 E8018-C3 E8018-W2	ER70S-3 ER70S-3 ER70S-6 ER80S-G	EL12	E71T-1/T-9 E70C-6M E71T-1/T-9 E70C-6M E81T1-W2
A612-87			E8018-C1			E81T1-Ni1
A615-87a	40 60 75		E7018 E9018 E11018-M	ER70S-3 ER120S-1		E71T-1/T-9 E70C-6M E91T1-K2 E100T1-K3
A616-87	50 60		E8018-C3 E9018-M	ER80S-Ni1 ER80SNi2		E71T-1/T-9 E70C-6M E91T1-K2
A617-87	40 60		E7018 E9018-M	ER70S-3		E71T-1/T-9 E70C-6M E91T1-K2
A618-88	All		E7018	ER70S-3		E71T-1/T-9 E70C-6M
A619-82 (1988)			E6011 E6012 E6013 E7018	ER70S-3		E71T-1/T-9 E70C-6M
A620-84			E6011 E6012 E6013 E7018	ER70S-3		E71T-1/T-9 E70C-6M
A621-82 (1988)			E6011 E6012 E6013 E7018	ER70S-3		E71T-1/T-9 E70C-6M
A622-82 (1988)			E6011 E6012 E6013 E7018	ER70S-3		E71T-1/T-9 E70C-6M
A633-88a	A, C, D E		E7018 E8018-C3	ER70S-3 ER70S-6 ER70S-6 ER80S-Ni1	EM12K EM12K	E71T-5 E70C-6M E81T1-Ni1 E81T1-Ni-2
A635-88	1006 thru 1023		E7018	ER70S-3		E71T-1/T-9 E70C-6M
A642-85			E6010	ER70S-3		E71T-14 (E71T-GS)
A649-87	2, 4 1A2 1A1 1B1 3 1B2	A C C A A	E7018 E8018-B2 E4140 E4130 E8018-B2 E11018-M	ER70S-3 ER80S-B2 ER4130 ER380-B2 ER120S-1		E71T-1/T-9 E70C-6M E81T1--B2 E4130LN E81T1-B2 E91T1-K2

A656-88	50, 60 70 80		E7018 E8018-C3 E9018-M	ER70S-3 ER80S-Ni1 ER80S-Ni2		E100T1-K3 E81T1-Ni1 E81T1-Ni-2 E91T1-K2 E100T1-K3
A659-85	All		E6010 E6011 E6013 E7018	ER70S-3		E71T-1/T-9 E70C-6M
A660-88	All		E7018	ER70S-3		E71T-1/T-9 E70C-6M
A662-86	A & B C		E7018 E8018-C3	ER70S-3 ER80S-Ni1 ER80S-Ni2		E71T-1/T-9 E70C-6M E81T1-Ni1 E81T1-Ni-2
A663-88	45, 50, 55, 60, 65 70, 75, 80		E7018 E7018-A1	ER70S-3 ER70S-2 ER80S-D2		E71T-1/T-9 E70C-6M E71T-1/T-9 E70C-6M
A666-88	201, 202, 301, 302, 304 304L, 304LN 316, 316N 316L		E308H E308L E316 E316L	ER308H ER308L ER308L ER316H ER316L ER316L	ER308H ER308L ER308L ER316H ER316L ER316L	E308HTx-x E308LTx-x E308LTx-x E316HTx-x E316LTx-x E316LTx-x
A668-85a	A, AH, B, BH, C, CH, D, DH E, EH, G, GH F, FH, H, HH J, JH, K, KH L, LH M, MH, N, NH	A A B	E7018 E8018-C1 E8018-B2 E11018-D2 E11018-M E8018-B6 (L)	ER70S-3 ER70S-6 ER80S-B2 ER100S-1 ER120S-1 ER80S-B6	EB2 EB6	E71T-1/T-9 E70C-6M E81T1-Ni1 E81T1-Ni-2 E91T1-B3 E100T1-K3 E110T1-K3 E81T1-B6
A671-85	CA55, CB60, CB65, CB70, CC65, CC70, CD70, CE55 CD80, CE60, CF65, CF70 CF66, CF71 CJ101 thru CJ113 CK75	A	E7018 E7018 E8018-C1 E8018-C2 E11018-M E7018-A1 E8018-B2	ER70S-3 ER70S-3 ER80S-Ni2 ER100S-1 ER80S-D2		E71T-1/T-9 E70C-6M E71T-1/T-9 E70C-6M E81T1-Ni1 E81T1-Ni-2 E91T1-B3 E100T1-K3 E110T1-K3
A672-81	A45, A50, A55, B55, B60, B65, B70, C55, V60, V65, C70, D70, D80, E55, E60 H75, H80 J80, J90, J100 K75, K85, L65, L70, L75, M70, M75, N75	A A A A	E7018 E7018 E7018 E7018-A1 E8018-B2 E7018-A1 E10018 E8018-B2 E8018-B2	ER70S-3 ER70S-3 ER70S-3 ER80S-D2 ER80S-D2 ER100S-1 ER80S-B2 ER80S-B2		E71T-1/T-9 E70C-6M E71T-1/T-9 E70C-6M E71T-1/T-9 E70C-6M E81T1-A1 E81T1-B2 E81T1-A1 E100T1-K3 E81T1-B2 E81T1-B2
A675-88	45, 50, 55, 60, 65, 70 75, 80, 90	A	E7018 E9018-M	ER70S-3 ER100S-1		E71T-1/T-9 E70C-6M E91T1-K2

RECOMMENDED FILLER METALS

ASTM	CLASS OR GRADE	PREHEAT TEMP.	SMAW	GMAW	SAW	FCAW/MCAW
A678-88	A B C, D	A	E7018 E8018-C3 E11018-M	ER80S-Ni1 ER80SNI2		E71T-1/T-9 E70C-6M E81T1-Ni1 E80T5-Ni-2 E100T1-K3
A688-88a	TP304 TP304L, TP304LN TP316 TP316L, TP316LN TPXM-29		E308H E308L E316H E316L	ER308H ER308L ER316H ER316L	ER308H ER308L ER316H ER316L	E308HTx-x E308LTx-x E308LTx-x E316HTx-x E316LTx-x E316LTx-x
A690-88	All	A	E8018-W2	ER80S-G		E81T1-W2
A691-85A	CM-65A, CM-70, CM-75, CMSH-70, CMSH-75 CMSH-80 1/2CR, 1CR, 1-1/4 CR 2-1/4 CR	A A	E7018-A1 E7018-A1 E8018-C3 E8018-B2 E9018-B3 (L)	ER80S-D2 ER80S-D2 ER80S-Ni1 ER80SNI2 ER80S-B2 ER90S-B3		E81T1-A1 E81T1-A1 E81T1-Ni1 E81T1-Ni-2 E81T1-B2 E91T1-B3
A692-88			E7018-A1	ER80S-D2		E81T1-A1
A694-87	All		E7018	ER70S-6		E71T-1/T-9 E70C-6M
A695-81 (1988)	A, B, C, D Grades 35 & 40 A, C, D Grades 45 & 50		E7018 E9018-M	ER70S-3 ER70S-3 ER80S-D2 ER80S-D2		E71T-1/T-9 E70C-6M E71T-1/T-9 E70C-6M E100T1-K3 E100T1-K3
A696-85	B C		E6010 to E6013 E7018	ER70S-3 ER70S-3 ER70S-6		E71T-1/T-9 E70C-6M E71T-1/T-9 E70C-6M
A704-85	40 60		E7018 E9018-M	ER70S-3 ER100S-1		E71T-1/T-9 E70C-6M E91T1-K2
A706-88	60	A	E8018-C3	ER80S-Ni1 ER80SNI2		E81T1-Ni1 E81T1-Ni-2
A707-87	L1, L2, L3 L4 L5, L6 L7, L8 L7, L8		E7018 E8018-C1 E8018-C3 E8018-C2	ER70S-6 ER80S-Ni2 ER80S-Ni1 ER80SNI2		E71T-12 E81T1-Ni2 E81T1-Ni1
A709-88a	36, 50 50W 70W 100	A A A	E6010 to E6013 E7014 E7018 E7024 E8018-W2 E8018-W2 E11018-M	ER70S-3 ER80S-G ER80S-G	EM12K	E71T-1/T-9 E70C-6M E81T1-W2 E81T1-W2 E100T1-K3
A710-87	A1, A3, B A2 C1, C3		E8018-C3 E8018-C3 E10018	ER80SNI2 ER80S-Ni1 ER80SNI2 ER100S-1		E91T1-Ni2 E71T-1/T-9 E70C-6M E91T1-K2
A714-84	All		E8018-W2	ER80S-G		E81T1-W2

A715-88	50, 60 70, 80		E7018 E8018-C3	ER70S-3 ER80S-Ni1 ER80SNI2		E71T-1/T-9 E70C-6M E91T1-Ni2
A724-88	All		E11018-M	ER120S-1		E100T1-K3
A727-87		A	E7018-A1	ER80S-D2		E81T1-A1
A730-81	A & B		E7018	ER70S-3		E71T-1/T-9 E70C-6M
A732-85	1A, 2A, 2Q, 3A, 5N 6N 7Q, 8Q, 14Q 9Q, 10Q	B B C C	E8018-C3 E10018-D2 E4130 E4340	ER70S-6 ER80S-Ni1 ER80S-D2 ER4130		E81T1-Ni1 E91T1-Ni2 E80C-G E4130LN
A734-87a	A B		E8018-C3 E8018-C1	ER80S-Ni1 ER80SNI2 ER80SNI2		E80T5-Ni2 E81T1-Ni2 E80T5-Ni2 E81T1-Ni1
A735-87	All	A	E10018-D2	ER80S-D2		E90T1-D3 E80C-G
A737-87	B C		E8018-C3 E9018-M	ER80S-Ni1 ER80SNI2 ER100S-1	EM12K	E80T5-Ni2 E81T1-Ni2 E100T5-K4 E100T1-K3
A738-87a	A B & C		E8018 E8018-W2 E9018-M	ER80S-G ER100S-1		E81T1-Ni1 E81T1-W2 E100T1-K3
A739-81A	B11 B22	B B	E8018-B2 E9018-B3	ER80S-B2 ER90S-B3		E81T1-B2 E91T1-B3
A744-88a	CF-8 CF-8M CF-8C CF-3 CF-3M		E308H E316H E347 E308L E316L	ER308H ER308L ER316H ER316L ER347 ER308LSi ER316LSi		E308HTx-x E308LTx-x E316HTx-x E316LTx-x E347Tx-x E308LTx-x E316LTx-x
A757-88a	A1Q, A2Q B2N, B2Q B3N, B3Q C1Q D1N1, D1N2, D1N3, D1Q1, D1Q2, D1Q3 E1Q, E2N, E3N	A B B	E7018 E8018-C1 E8018-C2 E8018-NM1 E9018-B3 E9018-B3 E11018-M	ER70S-3 ER80S-Ni2 ER90S-B3 ER90S-B3 ER120S-1		E71T-1/T-9 E70C-6M E81T1-Ni2 E91T1-B3 E91T1-B3 E110T1-K3
A758-88	All		E7018	ER70S-3		E71T-1/T-9 E70C-6M
A759-85			E7018	ER70S-3		E71T-1/T-9 E70C-6M
A765-87	I II		E8018-C3 E8018-C1	ER80S-Ni1 ER80SNI2 ER80S-Ni2		E81T1-Ni1
A769-88	36, 40, 45, 50, 60 80		E6010 to E6013 E9018-M E10018-M	ER70S-3 ER100S-1		E71T-1/T-9 E70C-6M E90T1-Ni2 E91T1-Ni2
A771-88	TP316		E316H	ER316H ER316L	ER316H ER316L	E316HTx-x E316LTx-x

RECOMMENDED FILLER METALS

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ASTM	CLASS OR GRADE	PREHEAT TEMP.	SMAW	GMAW	SAW	FCAW/MCAW
A774-88	TP304L TP316L TP317L TP321, TP347		E308L E316L E317L E347	ER308LSi ER316LSi ER317L ER347	ER308L ER316L ER317L ER347	E3087LTx-x E316LTx-x E317LTx-x E347Tx-x
A778-88	TP304L TP316L TP317L TP321, TP347		E308L E316L E317L E347	ER308LSi ER316LSi ER317L ER347	ER308L ER316L ER317L ER347	E3087LTx-x E316LTx-x E317LTx-x E347Tx-x
A782-87	1 2 3	A B B	E9018-B3 E11018-M E12018-M	ER90S-B3 ER120S-1	EB3	E81T1-B2 E91T1-B3 E110T1-K3
A787-84b	All		E6010 to E6013	ER70S-3		E71T-1/T-9 E70C-6M
A792-86	All		E6010 E6011	ER70S-3		E71T-14 (E71T-GS)
A793-85			E308H	ER308H ER308LSi	ER308L	E308HTx-x E308LTx-x
A795-88	A & B (If Galvanized)		E6010 to E6013 E6010	ER70S-3 ER70S-3		E71T-1/T-9 E70C-6M E71T-14 (E71T-GS)
A816-88	50 & 60		E6010 to E6013	ER70S-3		E71T-14 (E71T-GS)
A823-84	All		Nickel 55 Nickel 99	Nickel 55 Nickel 99	Nickel 99	Nickel 55
A844-87b			ENiCrMo-6			
A852-88A		A	E8018-W2	ER80S-G		E81T1-W2
A871-87		A	E8018-W2	ER80S-G		E81T1-W2
A873-87a	1, 2, 3, 4	B	E9018-B3	ER90S-B3	EB3	E91T1-B3