

Table 1. Selection of Filler Metal for Similar Welding

Base Material		Covered Electrodes		Welding Rods	
		Preferred Electrode	Alternative Electrode	ASME Spec.	Classification
Carbon Steel	See note 1	E70XX See note (3,4,9)	E60XX See note (3,4)	See note (5,6,7,8)	-
	See note 2	E70XX See note (3,4,9)	-	See note (5,6,7,8)	-
Carbon-molybdenum		E70XX-AI	-	See note (5)	-
ASTM A204 Gr. A OR H		E70XX-AI	-	See note (5,11)	-
ASTM A302 Gr. A OR B		E9018-D1 (0.41 Mo min)	E9015-D1 (0.41 Mo min)	See note (5,11)	-
2 1/4 nickel		E8018-C1	E8016-C1	See note (5,11)	-
2 1/4 nickel		E8018-C2	E8016-C2	See note (5,10,11)	-
Low Chromium Ferritic	1/2 Cr - 1/2 Mo	E8018-B2L	E8018-B2L See note (17)	See note (5,11,15,17)	0.05 C max
	1Cr - 1/2 Mo	E8018-B2L	E8018-B2L See note (17)	See note (5,11,15,17)	0.05 C max
	1 1/4 Cr - 1/2 Mo	E8018-B2L	E8018-B2L See note (17)	See note (5,11,15,17)	0.05 C max
	2 1/4 Cr - 1 Mo	E8018-B3L	E8018-B3L See note (17)	See note (5,11,15,17)	0.05 C max
5 Cr - 1/2 Mo	E502-15 0.05 C max	See note (17)	SFA 5.9 See note (17)	ER 502 0.05 C max	

Steels	7 Cr - 1/2 Mo	E7Cr-15 0.05 C max	See note (17)	See note (5,17)	0.05 C max
	9 Cr - 1 Mo	E505-15 0.05 C max	See note (17)	SFA 5.9 See note (17)	ER 505 0.05 C max
Ferritic Stainless Steel	AISI Type 405	Inco-Weld A Inconel182	E410-15 0.05 C max See note (16)	Inconel 82 or SFA5.9	ER410 0.05 C max
	AISI Type 410s	Inco-Weld A Inconel182	E410-15 0.05 C max See note (16)	Inconel 82 or SFA5.9	ER410 0.05 C max
	AISI Type 410	Inco-Weld A Inconel182	E410-15 0.05 C max	Inconel 82 or SFA5.9	ER410 0.05 C max
	AISI Type 430	E430-5	...	SFA 5.9	ER430
Austenitic Stainless Steel	AISI Type 304	E308-15	E308-16	SFA 5.9	ER308
	AISI Type 304L	E308L-15	E308L-16	SFA 5.9	ER308L
	AISI Type 321	E347-15	E347-16	SFA 5.9	ER347
	AISI Type 347	E347-15	E347-16	SFA 5.9	ER347
	AISI Type 316	E316-15	E16-8-2-15	SFA 5.9	ER316
	AISI Type 316L	E316L-15	E316L-16	SFA 5.9	ER316L
	AISI Type 309	E309-15	E309-16	SFA 5.9	ER309
	AISI Type 310	E310-15	E310-16	SFA 5.9	ER310
	Alloy 800, 800H	See note (12)	...	SFA 5.14	See note (12)
Nonferrous Metals and Alloys	Aluminum and Aluminum Alloys	SFA 5.10	...
	Aluminum bronze	ECuAl-A2(18)	...	SFA 5.7(18)	ERCuAl- A2(18)
	Phosphor bronze	ECuSn-A	ECuSn-C	SFA 5.7	ERCuSn-A
	Copper	ECu	...	SFA 5.7	ERCu
	67Ni-30Cu	ENiCu7	...	SFA 5.14	ERNiCu-7
	Hastelloy	See note See note (13)	13

	Alloy 600	See note (12)	12
	70Cu-30Ni	ECuNi(18)		SFA 5.7(18)	ERCuNi(18)
	90Cu-10Ni		...		
	Nickel	ENi-1	...	SFA 5.14	ERNi-1
Miscellaneous	20Cr-29Ni	E320-15	...	SFA 5.9	ER320
	2 1/2Mo-3Cu	See note (14)			See note (14)

Table 2. Selection of Filler Metal for Dissimilar Welding

Base Material Number	Base Material Type	Base Material Number															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Carbon Steel	A	D	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	Carbon-Molybdenum Steel		D	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	3 1/2 % Nickel Steel			E	B	B	B	B	B	B	B	B	B	B	B	B	B
4	9% Nickel Steel				B	B	B	B	B	B	B	B	B	B	B	B	B
5	AISI Type 410 S					B	B	B	B	B	B	B	B	B	B	B	B
6	AISI Type 410						B	B	B	B	B	B	B	B	B	B	B
7	AISI Type 304							G	G	H	H	H	H	H	H	B	B
8	AISI Type 304L								K	H	H	H	H	H	H	B	B
9	AISI Type 321									H	H	H	H	H	H	B	B
10	AISI Type 347										H	H	H	H	H	B	B
11	AISI Type 316											L	L	C	N	B	B
12	AISI Type 316L												M	C	N	B	B
13	AISI Type 309													C	N	B	B
14	AISI Type 310														N	B	B
15	Incoloy 825															B	B
16	Inconel 625																B

Filler metal AWS classification:

A -	E-XX16 or E-XX18
B -	Inco-Weld A, Inconel 82 or Inconel 182
C -	E309-15 or E309-16
D -	E7018-AI
E -	E80XX-CI. Alternatively one of the following classifications of the AWS A5.11: E Ni Cr Fe-3 or E Ni Cr Mo-3, by approval may be used.
G -	E308-15 or E308-16
H -	E347-15 or E347-16
J -	Use filler material complying with one of the following classification of AWS A5.11 : E Ni Cr Fe-3 or E Ni Cr Mo-3
K -	E308L-15 or E308L-16
L -	E316-15 or E316-16
M -	E316L-15 or E316L-16
N -	E310-15 or E310-16

Notes

- 1 Minimum ultimate strength less than 450N/mm²
- 2 Minimum ultimate strength 450N/mm² and greater
- 3 Low hydrogen electrodes and fluxes, or a low hydrogen weld process shall be used where any of the following requirements or conditions apply:
 - a) impact testing of weld metal
 - b) the carbon content of the base material exceeds 0.22%
 - c) the base material thickness exceeds 12mm
 - d) the specified yield strength of the base material exceeds 260 N/mm²
- 4 The following classifications are not acceptable for use in pressure containing welds : E6012, E6013, E6022, EXX14 and EXX24. However these classification s may be used for tank roof and bottom fillet welds after prior approval of purchaser. For single sided joints, E6010 and E6011 electrodes are permissible for root passes on piping only.
- 5 Where no AWS material specification exists for wire or rods, wire or rods of the same nominal composition as the

