

Table 1
Chemical Composition Requirements

AWS Classification ^{c,d}	UN Number ^c	COMPOSITION, Wt % ^{a,b}										OTHER ELEMENTS	
		C	Cr	Ni	Mo	Mn	Si	P	S	N	Cu	Element	Amount
ER209	S20980	0.05	20.5-24.0	9.5-12.0	1.5-3.0	4.0-7.0	0.9	0.03	0.03	0.10-0.30	0.75	V	0.10-0.30
ER218	S21880	0.1	16.0-18.0	8.0-9.0	0.75	7.0-9.0	3.5-4.5	0.03	0.03	0.08-0.18	0.75	-	-
ER219	S21980	0.05	19.0-21.5	5.5-7.0	0.75	8.0-10.0	1.00	0.03	0.03	0.10-0.30	0.75	-	-
ER240	S24080	0.05	17.0-19.0	4.0-6.0	0.75	10.5-13.5	1.00	0.03	0.03	0.10-0.30	0.75	-	-
ER307	S30780	0.04 - 0.14	19.5-22.0	8.0-10.7	0.5-1.5	3.3-4.75	0.30-.065	0.03	0.03	-	0.75	-	-
ER308	S30880	0.08	19.5-22.0	9.0-11.0	0.75	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER308H	S30880	0.04 - 0.08	19.5-22.0	9.0-11.0	0.5	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER308L	S30883	0.03	19.5-22.0	9.0-11.0	0.75	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER308Mo	S30882	0.08	18.0-21.0	9.0-12.0	2.0-3.0	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER308LMo	S30886	0.04	18.0-21.0	9.0-12.0	2.0-3.0	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER308Si	S30881	0.08	19.5-22.0	9.0-11.0	0.75	1.0-2.5	0.65-1.00	0.03	0.03	-	0.75	-	-
ER308LSi	S30888	0.03	19.5-22.0	9.0-11.0	0.75	1.0-2.5	0.65-1.00	0.03	0.03	-	0.75	-	-
ER309	S30980	0.12	23.0-25.0	12.0-14.0	0.75	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER309L	S30983	0.03	23.0-25.0	12.0-14.0	0.75	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER309Mo	S30982	0.12	23.0-25.0	12.0-14.0	2.0-3.0	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER309LMo	S30986	0.03	23.0-25.0	12.0-14.0	2.0-3.0	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER309Si	S30981	0.12	23.0-25.0	12.0-14.0	0.75	1.0-2.5	0.65-1.00	0.03	0.03	-	0.75	-	-
ER309LSi	S30988	0.03	23.0-25.0	12.0-14.0	0.75	1.0-2.5	0.65-1.00	0.03	0.03	-	0.75	-	-
ER310	S31080	0.08 - 0.15	25.0-28.0	20.0-22.5	0.75	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER312	S31380	0.15	28.0-32.0	8.0-10.5	0.75	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER316	S31680	0.08	18.0-20.0	11.0-14.0	2.0-3.0	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER316H	S31680	0.04 - 0.08	18.0-20.0	11.0-14.0	2.0-3.0	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER316L	S31683	0.03	18.0-20.0	11.0-14.0	2.0-3.0	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER316Si	S31681	0.08	18.0-20.0	11.0-14.0	2.0-3.0	1.0-2.5	0.65-1.00	0.03	0.03	-	0.75	-	-
ER316LSi	S31688	0.03	18.0-20.0	11.0-14.0	2.0-3.0	1.0-2.5	0.65-1.00	0.03	0.03	-	0.75	-	-
ER317	S31780	0.08	18.5-20.5	13.0-15.0	3.0-4.0	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER317L	S31783	0.03	18.5-20.5	13.0-15.0	3.0-4.0	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER318	S31980	0.08	18.0-20.0	11.0-14.0	2.0-3.0	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	Cb ^g	8°C min/1.0 max
ER320	N08021	0.07	19.0-21.0	32.0-36.0	2.0-3.0	2.5	0.6	0.03	0.03	-	3.0-4.0	Cb ^g	8°C min/1.0 max
ER320LR	N08022	0.025	19.0-21.0	32.0-36.0	2.0-3.0	1.5-2.0	0.15	0.015	0.02	-	3.0-4.0	Cb ^g	8°C min/0.40 max
ER321	S32180	0.08	18.5-20.5	9.0-10.5	0.75	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	Ti	9°C min/1.0 max
ER330	N08331	0.18 - 0.25	15.0-17.0	34.0-37.0	0.75	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	-	-
ER347	S34780	0.08	19.0-21.5	9.0-11.0	0.75	1.0-2.5	0.30-.065	0.03	0.03	-	0.75	Cb ^g	10°C min/1.0 max
ER347Si	S34788	0.08	19.0-21.5	9.0-11.0	0.75	1.0-2.5	0.65-1.00	0.03	0.03	-	0.75	Cb ^g	10°C min/1.0 max
ER383	N08028	0.025	26.5-28.5	30.0-33.0	3.2-4.2	1.0-2.5	0.5	0.02	0.03	-	0.70-1.5	-	-
ER385	N08904	0.025	19.5-21.5	24.0-26.0	4.2-5.2	1.0-2.5	0.5	0.02	0.03	-	1.2-2.0	-	-
ER409	S40900	0.08	10.5-13.5	0.6	0.5	0.8	0.8	0.03	0.03	-	0.75	Ti	10°C min/1.50 max

Table 1 (continued)
Chemical Composition Requirements

AWS Classification ^{c,d}	UN Number ^c	COMPOSITION, Wt % ^{a,b}										OTHER ELEMENTS	
		C	Cr	Ni	Mo	Mn	Si	P	S	N	Cu	Element	Amount
ER409Cb	S40940	0.08	10.5-13.5	0.6	0.5	0.8	1.00	0.04	0.03	–	0.75	Cb ^g	10*C min/0.75 max
ER410	S41080	0.12	11.5-13.5	0.6	0.75	0.6	0.5	0.03	0.03	–	0.75	–	–
ER410NiMo	S41086	0.06	11.0-12.5	4.0-5.0	0.4-0.7	0.6	0.5	0.03	0.03	–	0.75	–	–
ER420	S42080	0.25 - 0.40	12.0-14.0	0.6	0.75	0.6	0.5	0.03	0.03	–	0.75	–	–
ER430	S43080	0.1	15.5-17.0	0.6	0.75	0.6	0.5	0.03	0.03	–	0.75	–	–
ER446LMo	S44687	0.015	25.0-27.5	f	0.75-1.50	0.4	0.4	0.02	0.02	0.015	–	–	–
ER502 ^H	S50280	0.1	4.6-6.0	0.6	0.45-0.65	0.6	0.5	0.03	0.03	–	0.75	–	–
ER505 ^H	S50480	0.1	8.0-10.5	0.5	0.8-1.2	0.6	0.5	0.03	0.03	–	0.75	Cb ^g	0.15-0.30
ER630	S17480	0.05	16.0-16.75	4.5-5.0	0.75	0.25-0.75	0.75	0.03	0.03	–	3.25-4.00	Cb ^g	0.05
ER19-10H	S30480	0.04 - 0.08	18.5-20.0	9.0-11.0	0.25	1.0-2.0	0.30-.065	0.03	0.03	–	0.75	Ti	0.05
ER16-8-2	S16880	0.1	14.5-16.5	7.5-9.5	1.0-2.0	1.0-2.0	0.30-.065	0.03	0.03	–	0.75	–	–
ER2209	S39209	0.03	21.5-23.5	7.5-9.5	2.5-3.5	0.50-2.0	0.9	0.03	0.03	0.08-0.20	0.75	–	–
ER2553	S39553	0.04	24.0-27.0	4.5-6.5	2.9-3.9	1.5	1.00	0.04	0.03	0.10-0.25	1.5-2.5	–	–
ER3556	R30556	0.05 - 0.15	21.0-23.0	19.0-22.5	2.5-4.0	0.50-2.00	0.20-0.80	0.04	0.015	0.10-0.30	–	Co	16.0-21.0
												W	2.0-3.5
												Cbg	0.3
												Ta	.30-1.25
												Al	0.10-.050
												Zr	0.001-0.10
												La	.005-0.10
												B	0.02

NOTES:

- a. Analysis shall be made for the elements for which specific values are shown in this table. If the presence of other elements is indicated in the course of this work, the amount of those elements shall be determined to ensure that their total, excluding iron, does not exceed 0.50 percent.
- b. Single values shown are maximum percentages.
- c. In the designator for composite, stranded, and strip electrodes, the “R” shall be deleted. A designator “C” shall be used for composite and stranded electrodes and a designator “Q” shall be used for strip metal cored or stranded electrode and may not have the same UNS number. Consult ASTM/SAE Uniform Numbering System for the proper UNS Number.
- d. For special applications, electrodes and rods may be purchased with less than the specified silicon content.
- e. ASTM/SAE Unified Numbering system for Metals and Alloys
- f. Nickel + copper equals 0.5 percent maximum.
- g. Cb(Nb) may be reported as Cb(Nb) + Ta.
- h. These classifications also will be included in the next revision of ANSI/AWS A5.28, *Specification for Low Alloy Steel Filler Metals for Gas Shielded Metal Arc Welding*. They will be deleted from ANSI/AWS A5.9 in the first revision following publication of the revised ANSI/AWS A5.28 document.