Welding Rod Designations

Type	AWS Class	Current Type	Welding Position	Weld Results
Mild Steel	E6010	DCR	F, V, OH, H	Fast freeze, deep penetrating, flat beads, all-purpose welding.
	E6011	DCR, AC	F, V, OH, H	
	E6012	DCS, AC	F, V, OH, H	Fill-freeze, low penetration, for poor fit-up, good bead contour, minimum spatter.
	E6013	DCR, DCS, AC	F, V, OH, H	
	E6014	DCS, AC	F, V, OH, H	
	E6020	DCR, DCS, AC	F, H	Fast-fill, high deposition, deep groove welds, single pass.
	E6024	DCR, DCS, AC	F, H	
	E6027	DCR, DCS, AC	F, H	Iron powder, high deposition, deep penetration.
	E7014	DCR, DCS, AC	F, V, OH, H	Iron powder, low penetration, high speed.
	E7024	DCR, DCS, AC	F, H	Iron powder, high deposition, single and multiple pass.
Low Hydrogen	E6015	DCR	F, V, OH, H	Welding of high-sulphur and high-carbon steels that tend to develop porosity and crack under weld deposit.
	E6016	DCR, AC	F, V, OH, H	
	E6018	DCR, AC	F, V, OH, H	
	E7016	DCR, AC	F, V, OH, H	
	E7018	DCR, AC	F, V, OH, H	
	E7028	DCR, AC	F, H	
Stainless Steel	E308-15, 16	DC, AC	F, V, OH, H	Welding stainless steel 301, 302, 303, 304, 308
	E309-15, 16	DC, AC	F, V, OH, H	Welding 309 alloy at elevated temperature application and dissimilar metals.
	E310-15, 16	DC, AC	F, V, OH, H	Welding type 310 and 314 stainless steel where high corrosion and elevated temperatures are required.
	E316-15,16	DC, AC	F, V, OH, H	Welding type 316 stainless steel and welds of highest quality. Contains less carbon to minimize carbon transfer in the weld. Type 316 reduces pitting corrosion.
	E347-15, 16	DC. AC	F, V, OH, H	For welding all grades of stainless.
Low Alloy	E7011-A1	DCR, AC	F, V, OH, H	For welding common moly steels.
	E7020-A1	DCR, DCS, AC	F	
	E8018-C3	DCR, AC	F, V, OH, H	For low alloy, high-tensile strength.
	E10013-G	DCS, AC	F, V, OH, H	For low allow high-tensile steels.

DCR-Direct Current Reverse Polarity **AC-Alternation Current**

DCS-Direct Current Straight Polarity **F-flat, V- vertical, OH-overhead, H-Horizontal**

Welding Wire/Method Recommendations

Wire Type	Considerations
Solid Carbon-Steel **ER70S-6**	May be used with CO_2 or 75% Argon/25% CO_2 (C-25), SteelMIX®, SteelMIX® 3 or SteelMIX® extra. CO_2 gas provides deeper penetration. 75% Argon/25% CO_2 has less splatter than CO2. SteelMIX®(s) have less than either. Indoor use with no wind For auto body, manufacturing, fabrication. Welds thinner materials (22 gauge) than flux cored wires.
Flux Cored/ **Carbon Steel** **E71T-GS**	No shielding gas required. Excellent for outdoor windy conditions. For dirty, rusty, painted material. Hotter than sold wires, welds to 18 gauge material and thicker.
Solid Aluminum **ER-4043** **ER-5356**	Must be used with Argon, AluMIX®, or other Argon/Helium mixes. Recommended to be used with spool guns for best results. 5356 is harder for stronger welds and easier feeding.
Solid Stainless **Steel ER308/308L**	Use with StainMIX® 3 or Helium/Argon/CO2 mixtures. For 301, 302, 304, 305 and 308 stainless base metals.

Welding Wire Thickness Chart

Material Thickness	**MIG Solid Wire Size**			**Gasless Flux-Cored Wire Size**		
	.023”	.030”	.035”	.030”	.035”	.045”
22 Gauge (.031)						
20 Gauge (.037)						
18 Gauge (.050)						
16 Gauge (.063)						
14 Gauge (.078)						
1/8” (.125)						
3/16” (.188)						
1/4” (.25)						
Amperage	30-90	40-145	50-180	40-145	50-180	75-250
Wire Speed ipm	100-400	90-340	80-380	90-340	80-380	70-270

Metal Thickness – Amperage Required

Gauge Number	Fraction of An Inch	Amperage	Amps/Inch
18	3/64” = .047	47	Formula M * 1,000 = A M = Material(.000”) A = Welding Amps
16	1/16” = .062	62	
14	5/64” = .078	78	
12	1/10” = .100	100	
10	1/8” = .125	125	
8	5/32” = .156	156	
6	3/16” = .187	187	

Typical Welding Parameters of Mild and Low Alloy TIG, MIG

Process	Wire Diameter		Volts	Amps	Shielding Gas
	Inches	mm			
TIG (GTAW)	.035	0.9	10-12	50-70	100% Argon
	.045	1.14	10-12	70-100	
	1/16	1.6	12-15	100-125	
	3/32	2.4	15-20	125-175	
	1/8	3.2	15-20	175-250	
MIG (GMAW) Spray Transfer	.035	0.9	28-32	165-200	98% Argon + 2% Oxygen or 75% Argon + 25% CO_2
	.045	1.14	30-34	180-220	
	1/16	1.6	30-34	230-260	
MIG (GMAW) Short Circuit Transfer	.035	0.9	22-25	100-140	100% CO_2
	.045	1.14	23-26	120-150	75% Argon + 25% CO_2