

Stick Welding Tips

1. Take precautions with flying materials when chipping slag.
2. Keep electrodes clean and dry - follow manufacturer's recommendations.
3. Common steel electrodes: **(Refer to Diagram 8. Recommended Stick Electrodes)**
4. Penetration: DCEN - Least penetration, AC - medium (can be more spatter also), DCEP - most penetration.

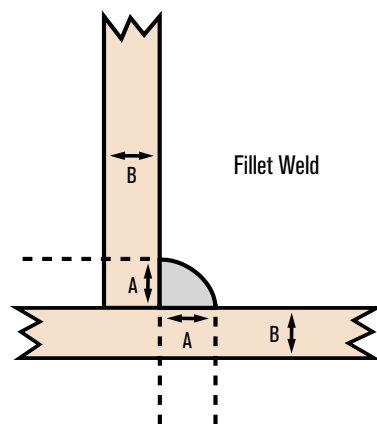
Diagram 8: Recommended Stick Electrodes			
Common Steel Electrodes			
AWS Class	Position	Polarity	Usage
A6011	All	AC, DCEN, DCEP	All-purpose stick electrode; used for carbon and galvanized steel; 60,000 PSI, tensile strength; deep penetrating and ideal for welding light to medium amounts of dirty, rusty or painted materials
E6013	All	AC, DCEN, DCEP	Light to medium penetrating all-purpose stick electrode; for use on carbon steel; 60,000 PSI tensile strength; good for general, all-purpose applications and joints with poor fit-up
E7014	All	AC, DCEN, DCEP	For high-deposition requirements; 70,000 PSI tensile strength; ideal for applications requiring light penetration and faster travel speeds
E7018	All	AC, DCEN, DCEP	Low-hydrogen electrode; for low, medium and high-carbon steels; 70,000 PSI tensile strength; ideal for out-of-position welding and tacking; not recommended for low-voltage AC welders
E7018AC	All	AC, DCEN, DCEP	Low-hydrogen electrode; for low, medium and high-carbon steels; 70,000 PSI tensile strength; ideal for out-of-position welding and tacking; not recommended for low-voltage AC welders; specially formulated to operate with small 208/230 volt AC welders
Specialty Stick Welding Electrodes			
AWS Class	Position	Polarity	Usage
Stainless Steel 308L	All	AC, DCEP	For 301, 302, 304, 305, 308 stainless base metal; good for build-up or cladding; easy slag removal
Stainless 312 Plus	All	AC/DC	For hard to weld or dissimilar metals, stainless, high carbon, cast, and high nickel steels; easy strike and re-strike, high moisture resistance, self-detaching slag
Cutting/ Chamfering	All	AC/DC	For cutting, beveling gouging of all metals including stainless steels, aluminum, and copper; for removal of weld joints overlays, or other unwanted materials
Flux Coated Brazing	---	---	Low fuming type brazing alloy for general purpose brazing of steel, cast iron, nickel, some nickel alloys, copper and some copper alloys; use oxyacetylene or other fuels suitable for brazing
Aluminum 4043	---	DC	Aluminum welding for flat, horizontal and vertical applications
Nickel 55 Cast Iron	All	AC/DC	55% nickel for cast iron; high strength, stronger than Nickel 99; machinable
Nickel 99 Cast Iron	All	AC/DC	99% nickel for cast iron; for light to medium weight castings; higher ductile strength than Nickel 55; easier to machine than Nickel 55
Hard Surfacing Overlay	---	AC/DC	Abrasion and impact resistance; bulldozer blades, plow shears; metal to earth applications; for high chromium carbide alloy steel
Hard Surfacing Buildup	---	AC/DC	Excellent impact; impact hammers, crusher rolls, railroad frogs; work hardens to 55-55 Rockwell C; for high chromium manganese alloy steel

DCEN – DC Electrode Negative (Straight polarity) DCEP – DC Electrode Positive (Reverse polarity)

5. When welding a fillet, the leg of the weld should be equal to the thickness of the parts welded. (Refer to Diagram 10. Recommended Fillet Weld Thickness)

6. To set your amperage control, first determine recommended amp range for your electrode type and diameter. Then pick an amperage within the range based on your metal thickness (thinner metal, less amps). (Refer to Diagram 7. Example of Good and Bad Stick Welds)

Diagram 10: Recommended Fillet Weld Thickness



The leg (A) of the weld should be equal to the thickness of the parts welded (B).

Diagram 7:

Example of Good and Bad Stick Welds

Good
Weld



Travel
Too Fast



Travel
Too Slow



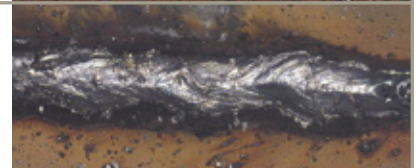
Arc
Too Short



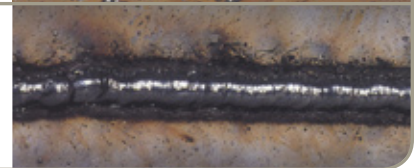
Arc
Too Long



Amperage
Too High



Amperage
Too Low



7. Electrode Polarity and Amperage

ELECTRODE POLARITY CHART					
ELECTRODE	DC*	AC	POSITION	PENETRATION	USAGE
6011	EP	✓	ALL	DEEP	
6013	EP, EN	✓	ALL	LOW	GENERAL
7014	EP, EN	✓	ALL	MED.	SMOOTH, EASY, FAST
7018	EP	✓	ALL	LOW	LOW HYDROGEN, STRONG
7024	EP, EN	✓	FLAT HORIZ. FILLET	LOW	SMOOTH, EASY, FASTER
Ni-CI	EP	✓	ALL	LOW	CAST IRON
308L	EP	✓	ALL	LOW	STAINLESS

*EP = ELECTRODE POSITIVE (REVERSE POLARITY)
EN = ELECTRODE NEGATIVE (STRAIGHT POLARITY)

ELECTRODE/AMPERAGE CHART								
ELECTRODE	DIAMETER		AMPERAGE RANGE					
	IN	MM	MIN.	50 A	100 A	150 A	200 A	MAX.
	6010 & 6011	3/32 1/8 5/32 3/16	2.4 3.2 4.0 4.8					
6013	1/16 5/64 3/32 1/8 5/32 3/16	1.6 2.0 2.4 3.2 4.0 4.8						
7014	3/32 1/8 5/32	2.4 3.2 4.0						
7018	3/32 1/8 5/32	2.4 3.2 4.0						
7024	3/32 1/8 5/32	2.4 3.2 4.0						
Ni-CI	3/32 1/8 5/32 3/16	2.4 3.2 4.0 4.8						
308L	3/32 1/8 5/32	2.4 3.2 4.0						