



Welding FAQ

Why is arc welding a good choice?

Arc welding is an easy, fast, efficient, inexpensive and strong way to join metals.

What is arc welding?

Arc welding is the process of joining metals by melting them together using the heat of an electric arc.

What types of metal can be welded?

The most common metals are steel, aluminum and stainless.

Where can welding be done?

With the right equipment, welding can be done in a shop or outside.

Who can weld?

Virtually anyone who wants to learn. Most products on a retail shelf are for welding steel. Each combination of machine and electrode is best suited for certain applications.

What Metal is Weldable?

Do the magnet test. If the metal attracts a magnet, it can be welded with the products on the shelf for steel.

What is the Difference between Welding and Brazing or Soldering?

Brazing or soldering form a bond but do not melt the original metal. A weld consists of 3 separate components. Part of the weld comes from the original two base metals and the other comes from the electrode or filler metal used to make the weld.

Is Welding Safe?

Yes. Welding is safe when done in accordance with the manufacturer's recommended safety and equipment use.

Welding Equipment

Stick Welders

Heating the coated stick electrode and the base metal with an arc creates fusion of metals. An AC and/or DC electrical current is produced by this machine to create the heat needed. An electrode holder handles stick electrodes and a ground clamp completes the circuit.

TIG Welders

A less intense current produces a finer, more aesthetically pleasing weld appearance. A tungsten electrode (non-consumable) is used to carry the arc to the work piece. Filler metals are sometimes supplied with a separate electrode. Gas is used for shielding. (Process is also known as GTAW, or Gas Tungsten Arc Welding.)

MIG Welders and Multi-Process Welders

Constant Voltage and Constant Current welders are used for MIG welding and are a semi-automated process when used in conjunction with a wire feeder. Wire is fed through a gun to the weld-joint as long as the trigger is depressed. This process is easier to operate than stick welding and provides higher productivity levels. CC/CV welders operate similarly to CC (MIG) welders except that they possess multi-process capabilities - meaning that they are capable of performing flux-cored, stick and even TIG processes as well as MIG.

Engine Driven Welders

Large stick or multi-process welders are able to operate independent of input power and are powered by a gasoline, diesel, or LPG engine instead. Ideal for construction sites and places where power is unavailable.

Wire Feeder / Welders

For MIG welding or Flux-Cored wire welding, wire feeder welders are usually complete and portable welding kits. A small built in wire feeder guides wire through the gun to the piece.

STICK WELDERS & ELECTRODES ADVANTAGES

- Dependable.
- Welds a wide range of metal thicknesses.
- Welds different types of metal with the proper electrode.

Electrodes for Stick Welders

Designated by American Welding Society classifications. AWS classifications determine electrode characteristics.

E6011- Best on dirty, rusty or old steel. Good for structural welds.

E6013- Easy to operate – good general purpose. For new or clean steel.

E7014- High strength – smooth operation and weld appearance

E7018- High strength – contractor use. Easy strike tip for good starts.

**All above operate on AC or DC output*

WIRE FEED WELDERS & CONSUMABLES

- Easy to operate – best for beginners.
- Portable – weighs less than 60 lbs.
- Several units operate on 115 volt service.
- Versatile – weld different metals with proper set up.

Consumables for Wire Feed Welders

INNERSHIELD® NR-211-MP (E71T-11) Flux-Cored Wire - Hollow wire with flux on the inside is great for general purpose welding on steel. Flux-cored wires work in all Lincoln Electric retail wire feed welders.

SuperArc® L-56 (ER70S-6) MIG Wire - Metal Inert Gas is a solid wire that requires an external gas shielding. Wire feed machine must be equipped with a gas solenoid. Best for thin metal. Good appearance and low spatter.

Aluminum and Stainless

**Refer to www.lincolnelectric.com for specific procedure and machine set up.*

GLOSSARY OF WELDING TERMS

AC - Alternating Current.

ARC - The completion of an electric circuit between the electrode and the metal being welded.

AWS - American Welding Society.

BRAZING - Joining process that creates a bond but does not melt the metal being joined.

CHIPPING HAMMER - Tool used to chip off slag or spatter.

DC - Direct Current.

DUTY CYCLE - The percentage of continuous minutes that a machine can run at the rated output in a 10 minute period. I.e. 20% duty cycle is minimum of 2 continuous minutes out of every 10.

ELECTRODES - Conducts the electricity – creates the arc and melts to become part of the weld (stick and wire electrodes).

ELECTRODE HOLDER - The part of a stick welding machine that holds the electrode.

FLUX - The coating on the outside of a stick electrode or the inside of the flux-cored wire electrode. The flux protects the weld from impurities and adds physical and chemical properties to the weld.

FCAW (FLUX-CORED ARC WELDING) - Refers to hollow wire electrode with a flux-core. This allows the wire electrode to create a weld without the use of an external shielding gas.

GMAW (GAS METAL ARC WELDING) - Also known as MIG.

GUN - The part of the wire feed welder in which a trigger is depressed and from which the wire feeds.

INPUT POWER - The amount of electrical power required to operate a welding machine.

INNERSHIELD® - Lincoln Electric's trade name for flux-cored wire.

MIG (METAL INERT GAS) - Refers to welding with a solid wire using an external gas shielding.

MILD STEEL - General purpose – everyday type of steel.

OUTPUT POWER - The amount of power available in each machine to weld.

PENETRATION - The depth that the weld melts into the metal being joined.

ROD - Common term used to refer to stick electrode.

SPATTER - Small pieces of molten metal created during the welding process.

TIG (TUNGSTEN INERT GAS) - A process that uses a non-consumable electrode. The tungsten electrode creates the arc but does not melt or become part of the weld.

WELDING - Joining metal together by a fusion process. In the case of arc welding, the metals are fused together using an electric arc created by the welding electrode.

WORK CLAMP - The clamp used to complete the electric circuit. The work clamp must be attached to clean steel to ensure a good connection.