

HELP ME CHOOSE

If you're not familiar with welding basics, the following information can make choosing a machine easier. For interactive, highly informative assistance, go to MillerWelds.com.

1 Pick Your Welding or Cutting Process

Select the process that matches the metals you want to weld or cut.

Metal Type	Stick	MIG	FCAW	SAW	AC-TIG	DC-TIG	Resistance Spot	CAC-A AC	CAC-A DC	Plasma
Steel	●	●	●	●		●	●		●	●
Stainless Steel	●	●	●	●		●	●		●	●
Nickel Alloys	●	●				●	●			●
Aluminum		●			●				●	●
Cast Iron	●								●	●
Copper, Brass		●				●		●		●
Titanium						●				●
Magnesium Alloys					●					●
All Electrically Conductive										●
Skill Level	Moderate	Low	Low	Moderate	High	High	Low	Moderate	Moderate	Low
Key: ● Recommended	Welding Process						Cutting Process			

2 Understand Process Advantages

Unfortunately, there is no single welding or cutting process suitable for all applications. For this reason, it is necessary to consider the advantages of one process over another.

Welding Process



Stick (SMAW)

- Better suited for windy, outdoor conditions
- More forgiving when welding on dirty or rusty metal



MIG (GMAW)

- Easiest process to learn
- High welding speeds possible
- Provides better control on thinner metals
- Cleaner welds possible with no slag to clean
- Same equipment can be used for Flux-Cored welding

Pulsed MIG (GMAW-P)

- Flexibility and productivity—nearly all metals can be welded in all positions
- Larger diameter electrode wires
- Virtually no spatter
- Welds thin to thick metals



Flux-Cored (FC)

- Works as well as Stick on dirty or rusty material
- Out-of-position welding
- Deep penetration for welding thick sections
- Increased metal deposition rate



Resistance Spot

- Portable, easy-to-operate welder for light industrial applications



Submerged Arc (SAW)

- High deposition rates can enhance weld speed and production
- Excellent mechanical properties for high-quality code and X-ray requirements
- Improves welding operator comfort and appeal—arc is below bed of flux



TIG (GTAW)

- Provides highest quality and most precise welds
- Highly aesthetic weld beads
- Allows adjustment of heat input while welding by use of a remote control

Pulsed TIG (GTAW-P)

- More control on thin metals
- Less heat distortion on thin metals

Cutting Process



Air Carbon Arc Cutting and Gouging (CAC-A)

- Wide variety of metals
- Removes discontinuities or inferior welds



Plasma Arc Cutting and Gouging (PAC)

- Use with any electrically conductive metals
- Small and precise cut
- Small heat-affected zone which helps prevent warping or paint damage

3 Pick your Power and Portability Needs

What should I know about duty cycle?

Duty cycle is the amount of time during a 10-minute period that the welder can continuously operate at its rated output without causing heat damage to the system. For example, a Millermatic 252 has 60 percent duty cycle at 200 amps of DC output. It can weld for six minutes out of 10 and then needs to cool for the remaining four minutes.

For applications requiring extensive arc-on time and/or welding at high amperages, choose a welder with a higher duty cycle, such as a Deltaweld 452 with 450 amps of DC output at 100 percent duty cycle. If a welder is operated below its rated output, the duty cycle typically increases.

How much welding or cutting output power do I need?

● **Light Industrial** products are suitable for the home hobbyist or occasional user. Designed to be easy to operate, affordably priced and typically have a 20 percent duty cycle and rated output of 230 amps or lower.

● **Industrial** products are suitable for applications that do not require high-volume production and typically have a 40–60 percent duty cycle and/or rated output of 300 amps or lower. Appropriate choice for professional welders.

● **Heavy Industrial** products typically have a duty cycle of 60–100 percent and a rated output of at least 300 amps, making them suited to high-volume production and/or welding of thicker materials. Designed with the arc characteristics and product features professional welders demand for code-quality work.

Note: Units listed in more than one classification share attributes of both.

Generator power

Out in the field, you may need an engine-driven welder/generator to supply 120 or 240 VAC power to run tools, lights and to start motors. Miller® engine drives are packed with power and the larger units even offer option packages that add 10 to 20 kW of generator power.

What kind of input power do I have available?

To select the right product, you need to know the type of primary power available.

1 Phase Single-phase products require single-phase input power, typically found in homes and garages.

3 Phase Three-phase products require three-phase input power which is common in industrial settings, but shops can be specially wired to supply three-phase, industrial power.

 For locations where an electrical hook-up is not practical, consider a gas or diesel-powered, engine-driven welder/generator to supply welding and generator power.

Is portability needed?

Can you bring the work to the machine, or does the machine need to go to the work? Check the Product Guide pages for types of portability:

- Shoulder strap, handles, running gear, carts, etc.
- Many engine-driven welding generators fit in the back of a pick-up truck, enabling them to drive to wherever the welding is needed. Heavy-duty trailers are also available for engine drives.

Power Icons

1 Phase Unit requires single-phase input power

3 Phase Unit requires three-phase input power

AC Unit supplies alternating current weld output

DC Unit supplies direct current weld output

AC/DC Unit supplies alternating current and direct current weld output

CC Unit supplies constant-current weld output

CV Unit supplies constant-voltage weld output

CC/CV Unit supplies constant-current and constant-voltage weld output

4 Check Out the Product Guides

The Product Guides (start of each major section) contain a list of Miller® power sources for that process section.

Note: Visit MillerWelds.com for the most current information.

5 Go to Product Descriptions

Each color-coded section is identified by a primary process icon and title.

For more product specifications, give the product name and literature number to your distributor, visit us on the Web at MillerWelds.com or call 1-800-4-A-MILLER.

Note: Product specifications subject to change without notice.

Listing of recommended processes. Colored bullets indicate power classification. Power icons indicate power supplied or required. See descriptions above.

Brief listing of most popular accessories. Refer to pages listed for more details.