



What's the Difference between MIG & TIG Welding?

By Greg Donaldson & Al Farrar

The ability of Quality Products and Machine, LLC to be both a machine and fabrication shop makes it one of the most unique CNC machining businesses in the southeast. In the fabrication shop, Quality Products performs several different types of welding, including both MIG and TIG.



Also referred to as Gas Metal Arc Welding (GMAW), MIG -- an abbreviation for Metal Inert Gas -- is a semi-automatic welding process that feeds a consumable, which is the wire, onto the workpiece. TIG, which stands for Tungsten Inert Gas, and can sometimes be called Gas Tungsten Arc Welding (GTAW), is a manual welding process that uses a non-consumable tungsten electrode to produce the weld.

The differences between MIG and TIG don't end there. TIG is a much more involved process because it requires the welder's opposite hand to feed a metal filler wire into the arc of the weld and the use of a foot pedal to control the heat.

Because TIG is a more complicated process, MIG is better for big projects, heavy materials, and out-of-position welding. Quality Products also prefers MIG in situations where a customer has a lot of parts or thick workpieces because MIG will complete the project in a shorter time frame.

But unlike TIG, MIG welding creates more work after the bead is complete. Spatter from the sparks in the quicker welding process often lands on the metal materials newly joined together.



Not only is TIG a cleaner process, it provides welders a greater chance to be artistic. With TIG, welders have full control over the amount of heat and the penetration level of the bead. They can also start and stop in any position and don't have to worry about impurities.

Therefore, TIG welding beads are often considered "signature." It's more likely a welder takes greater pride in their beads completed through the TIG process than MIG.



TIG takes more coordination, as the welder uses both of its hands and one foot. This will produce a higher quality weld that will not require as much cleanup. But the drawback is a much longer and more expensive process.

Typically, customers decide which welding process they want used on their parts, but Quality Products will make suggestions. Design intent usually has the biggest impact on choosing the welding process, but other factors such as time and expense play a role too.

A lot of the same materials, such as aluminum, carbon steels and stainless steels, can be used with both MIG and TIG. Brass is one example of a metal that can only be joined together with TIG welding.

Quality Products, who employs five welders, is not necessarily unique in its ability to perform both MIG and TIG, but the company's knowledge and ability to excel at both processes sets it apart from the competition.

About the Authors



Greg Donaldson

Greg has worked in fabrication at Quality Products for two decades. He began his tenure with the company as a welder in 2002 and was promoted to Fabrication Manager a year later. Greg became Shipping Manager as well in 2018. He was promoted to his current position as Operations Manager in 2021



Al Farrar

The Compass Precision Employee of the Month in March 2020, Al has served Quality Products as its lead welder. He also manages safety and organizes lean meetings. Al is certified in MIG & TIG through the American Welding Society and American Society of Mechanical Engineers. He was promoted to his current position as Fabrication Manager in 2023.