

180AP, 200AP, 300AP Pulse TIG parameters

Pulse welding uses current that cycles between a high and low value. This has significant benefits; the most important being the ability to make a weld with good penetration but with less total heat being put into the metal being welded.

Pulse Parameters

- Pulse Peak Current (Amps)
- Pulse Base Current (Amps)
- Pulse Duty (Pulse Width) (Percent)
- Pulse Frequency (Hz)

Choosing settings

While pulsing at any frequency will lessen the total heat input, there are distinct characteristics available at different points in the spectrum. Some people use a very low pulse frequency (around one pulse per second) to time the addition of filler rod. This is like a musician using a metronome to keep accurate time with the music. Most welders hold the torch stationary and add filler rod during the peak portion of the cycle, then retract the rod and advance the torch during the background period. This is also an excellent way to accentuate the “dime on dime” look that many people prize as the hallmark of a beautiful TIG weld.

This low frequency may also be beneficial when making a pass over a weld that has an uneven bead profile. The slow, even pulsing can add a regular ripple pattern that wasn't there previously. Filler rod is not generally added when using this technique.

In the 2 to 10 pulses-per-second range, the arc is considered “soft.” This is ideal if you want a broad bead, and deep penetration is not the goal. An outside corner joint is one example where this may be desirable, or a final “wash” pass that caps off multiple root passes.

Pulsing between 10 and 30 cycles per second causes a “strobe” condition that many people find upsetting. You may want to experiment with this range, but you may find it disorienting. One hundred cycles per second is the default setting for many TIG welding power sources. It is a middle-of-the-road option, making it a good choice for a broad range of welding projects. It's probably a good place to start as you experiment with different pulse settings.

Pulse frequencies above 100 cycles per second tend to make the arc “stiffer” when TIG welding. This can help drive the penetration deeper into a narrow joint. This may also allow faster travel speeds and give the arc better directional control. Pulsing up to 500 cycles per second can maximize these benefits.

The background setting allows you to control the cooler portion of the cycle. A good place to start is 25% to 40% less of Peak Pulse current, with higher settings giving you a more fluid puddle and faster travel speeds and lower settings giving the most reduction in the heat input.

Pulse Duty (Pulse Width) time in peak. A larger percentage will give you more heat in the weld, along with a wider bead and deeper penetration. Note that there can be too much of a good thing here, since the primary benefit of pulsing is to LOWER the heat in the base metal. A good place to start is between 40% and 60%.

You will need to set the amperage higher when pulsing, since the nature of the process reduces the overall heat that enters the metal.