

Welding With Arc Pulsation

Arc pulsing involves using the welding power supply to rapidly alternate the weld current from a high (peak current) to a low (background current) value. This welding technique brings many benefits to the welding procedure, often improving weld quality and repeatability. In some cases materials and weld joints that are difficult to successfully weld with a non-pulsed arc can easily be welded with a pulsed arc technique.

Arc pulsing involves four welding parameters: peak current, background current, pulse width (duty cycle), and pulse frequency. It is important to understand how to choose convenient weld development starting parameters and the effect on the weld by changing each parameter.

Benefits Of Arc Pulsing

1. **Lower Heat Input To Part**
 - Defeating thermal conductivity
2. **Improved Weld Depth/Width Ratio**
 - Narrowing of the arc
 - Defeating thermal conductivity
3. **Arc Puddle Control**
 - Control of arc puddle convection flow
 - Due to arc force and magnetic effect
 - Degassing benefit, minimizes porosity
 - Puddle freezes faster, this helps defeat gravity in out of position welding
4. **Arc Stability**
 - Less arc wander or problems with weld pool surface tension
5. **Increased Weld Speed**
 - Smaller/shorter weld pool allows for faster travel
 - Puddle agitation/mixing
 - Improved arc stability
6. **Improved Weld Quality**
 - Reduced heat affected zone, improved weld depth/width ratio
 - Improved weld appearance and consistency
 - Control of arc puddle convection flow
 - Even distribution of slag/contaminant
 - Reduced porosity, reduction of oxides
 - Faster solidification rates provide a finer dendritic structure
 - Reduces dilution of dissimilar materials