Demand Pulse MIG – a NEW Process!

Demand Pulse MIG was patented on June 6, 1985, making it the newest welding process available for manual joining of most commercial metals.

Demand Pulse is possible because of the latest in electronic switches – the MOSFET, an extremely fast electronic switch. Using Constant Current DC power, a wire is fed into the arc zone. As the wire approaches the work, the voltage drops as a function of the arc length. At a pre-selected arc voltage (usually 15 volts), the Mosfets fire a pulse of current to expel the tip of the wire across the arc gap. This current is supplied by means of a parallel resistor in the main current control circuit and is generally 100 amps. Switching time is measured in nanoseconds, and the total cycle time is very short, perhaps 15 nanoseconds. An inductor is not required, nor desired, since fast switching is essential. Perfectly tuned, the pulse cycles 200 times per second or slightly less.

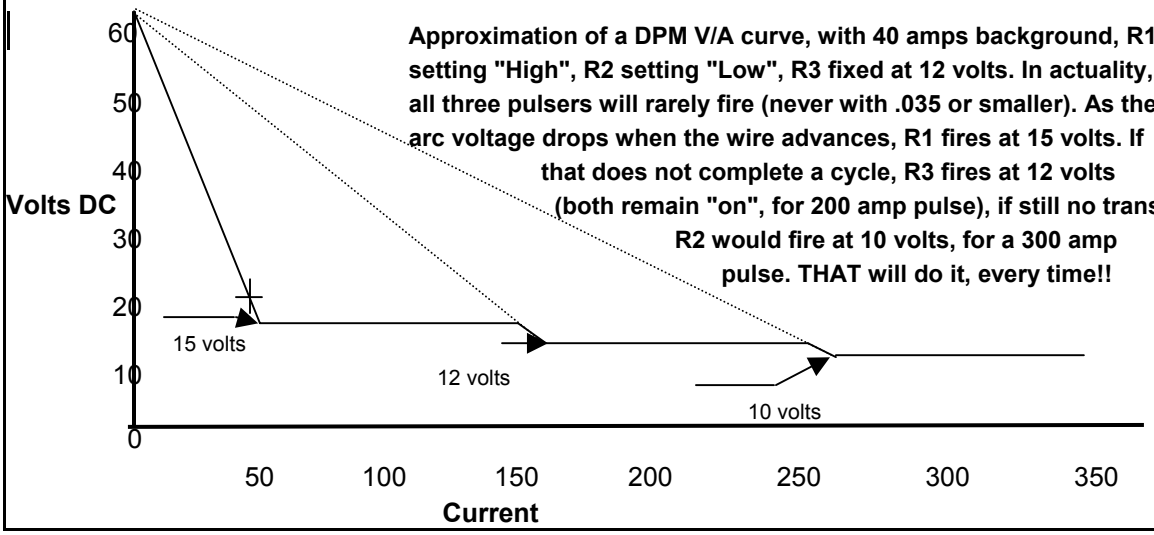
The arc looks and sounds like "short-arc", but a close look will show that there is no short-circuit. The arc length is from .020" to .090", very short compared to GMAW-P done with conventional machines. This short arc length, combined with the short duration of the pulse, and the low current required to effect transfer gives a total arc "heat" far below that of either short-circuit transfer, or conventional GMAW-P. Fusion is excellent, because the arc never goes "out".

Both short-arc and normal GMAW-P have peak currents in the range of 350 - 650 amps, and the duration of the peak current portion of the cycle is quite long, many times longer than the Demand Pulse cycle. Short-arc peak time is approximately 3 milliseconds, and the current is 350-450 during the short circuit portion of the cycle; GMAW-P has similar currents (sometimes as high as 650!) and duration and at much higher voltages. Demand Pulse is at peak (which ranges from 110 to 400 amps) for only 3 NANOseconds or so. Three nanoseconds is 1/1000 of 3 MILLIseconds, so the effective heating applied to the welding torch and the operator is many times greater using "conventional" processes.

We do demos using a 160 amp torch, and at 220 amps indicated average current, the torch barely gets hot. At typical DPM currents, it is cool as a cucumber, particularly when compared with short-arc or GMAW-P.

The chart below shows an approximate V/A curve when using DPM to weld open-butt pipe joints. Notice that the curve is very flat from the trigger point on out. There is NO short-circuit. The curve is Constant Current PLUS Constant Voltage, a totally unique and patented method of joining metals. The 40 amp background current results in an average output of 75 amps, 18 volts. We have users welding aluminum, carbon steel, galvanized, Inconel®, stainless, even *titanium* with GREAT results, to ASME and AWS CODE! With little to NO spatter!

Try one on YOUR work! Call or write 888-254-3835 or sales@aftekwelders.com



Approximation of a DPM V/A curve, with 40 amps background, R1 setting "High", R2 setting "Low", R3 fixed at 12 volts. In actuality, all three pulsers will rarely fire (never with .035 or smaller). As the arc voltage drops when the wire advances, R1 fires at 15 volts. If that does not complete a cycle, R3 fires at 12 volts (both remain "on", for 200 amp pulse), if still no transfer, R2 would fire at 10 volts, for a 300 amp pulse. THAT will do it, every time!!

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