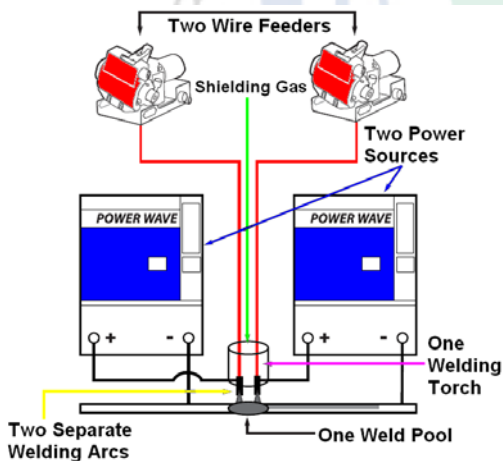


TANDEM MIG

PROCESS DEFINITION

Tandem MIG is a dual wire GMAW process that is used in automated welding applications to improve welding productivity. The process uses two welding power sources and two wire feeders acting in tandem to deliver two wire electrodes through a single welding torch.

The two welding arcs that are generated are electrically isolated from one another and are controlled independently. The welding arcs work together, generally separated by less than 0.50 inches, in the same weld pool. The independent control of the two welding arcs is used to control the thermal and fluid dynamics of the weld pool to further enhance welding performance. The added deposit rate achieved by the dual wire delivery and the added weld pool control is used to overcome single wire limitations to produce high travel speeds and electrode melt-off rates (weld metal deposition).



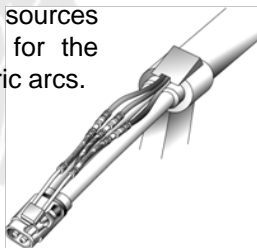
EQUIPMENT

• Power Sources

It was vital that the two power sources communicate with each other for the synchronization of the two electric arcs.

• Wire Feeders

• Welding Torch

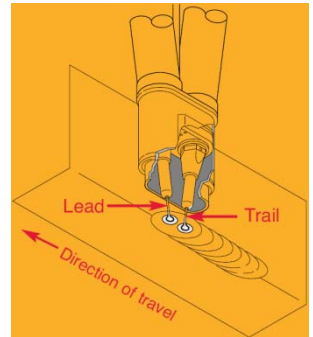


MODES OF TRANSFER

Two wire electrodes are positioned in line, in the direction of travel. The first electrode, the "lead", controls deposition rate and penetration. The second electrode, the "trail", controls weld bead appearance.

Pulsed/Standard mode:

Lead arc is synchronized pulsed while the Trailing arc is Constant Voltage for achieving maximum welding speed and gap bridging.



Standard/Pulsed mode:

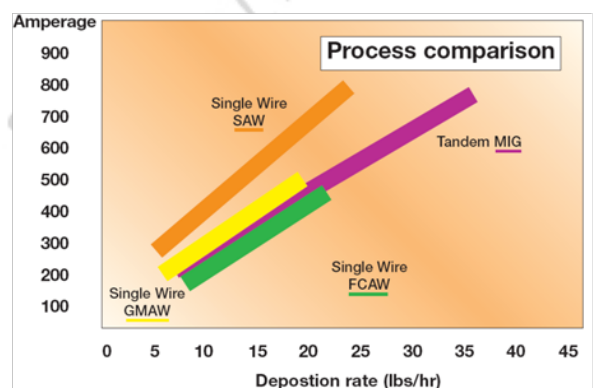
Best for deep penetration the Lead arc is in Constant Voltage mode which maximizes penetration and travel speed while the Trailing arc is in pulse mode to reduce heat input and cool the weld puddle.

Standard/Standard mode:

Lead and Trailing arcs are both in Constant Voltage mode usually for welding with just one electrode and switching to the other when changing directions to reduce cycle time.

ADVANTAGES

- ✓ Exceptional welding speeds
- ✓ High weld metal deposition rate
- ✓ Superior weld quality:
 - Reduced heat input
 - Resists burn-through on thin materials
 - Maintains low spatter levels
 - Produces good penetration on thick materials
 - Improves bead wetting at weld toes
 - Resists undercut
- ✓ Bead profile control
- ✓ Lowers production costs
- ✓ Increases productivity



APPLICATIONS

High Travel Speed Welding:

- Automotive components
- Wheels, large and small
- Cylinders
- Tanks
- Gussets and Stiffeners
- Many thin gauge lap and filler welds

High Deposition Welding:

- Heavy equipment
- ASME tanks
- Structural
- Railroad industry
- Pipe and tubular components

REFERENCES

- www.lincolnelectric.com
- www.wolfrobotics.com/products/images/TwinWireMIGbro.pdf