

Pipe Contractor Increases Productivity 4X, Deposits 962 kg of Metal with Zero Defects

- Contractor opts for ESAB's "3-run" solution combining cellulosic, basic and flux cored electrodes and the Pipeweld Orbiter mechanized welding system.
- Contractor completes welding work 4X faster than Stick-only (MMA) solution.

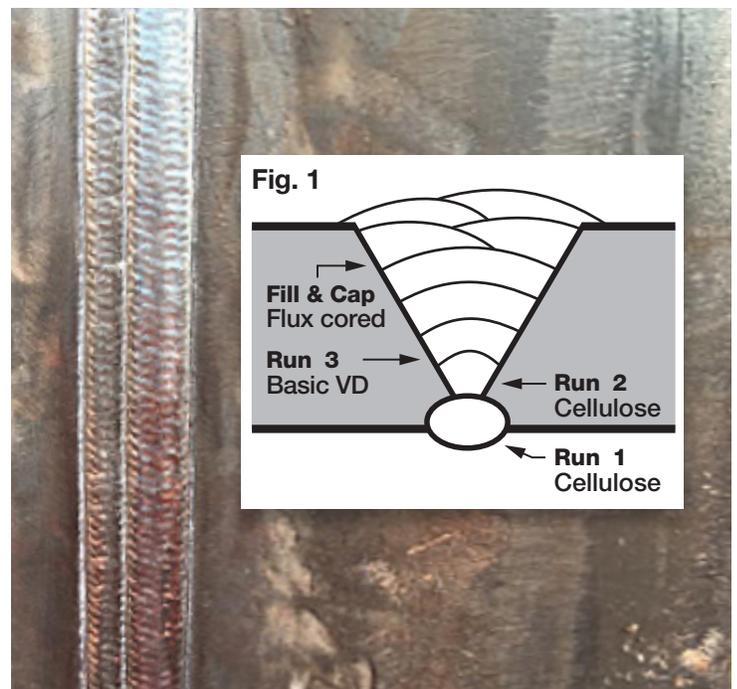
Situation

A UK-based pipeline contractor won a contract to weld a 984 ft. (300 m) section of pipe for a water supply company. The Grade 30 pipe had a diameter of 88 in. (2235.2 mm) and a thickness of 1 in. (25.4 mm) thick. Each joint had a 60-degree included angle and would require a total of 57.3 lbs. (26 kg) of weld metal; the project had 37 sections to join. Due to the size of the pipe, welding procedure and equipment choice were critical for the timely completion of the project.

Solution

The ESAB 3-run solution (Fig. 1) combines Pipeweld cellulosic and Pipeweld 90DH basic (low-hydrogen) electrodes to create a clean basis for making fill and cap passes with Pipeweld 91T-1 flux cored wire and the ESAB Pipeweld Orbiter mechanized welding system.

With mechanized welding, operators completed one weld pass on the 88-in. water pipe every 15 minutes. By using one Pipeweld Orbiter on each side of the pipe, **the contractor finished each joint in just six hours** — compared to 24 hours for a traditional Stick-only process.

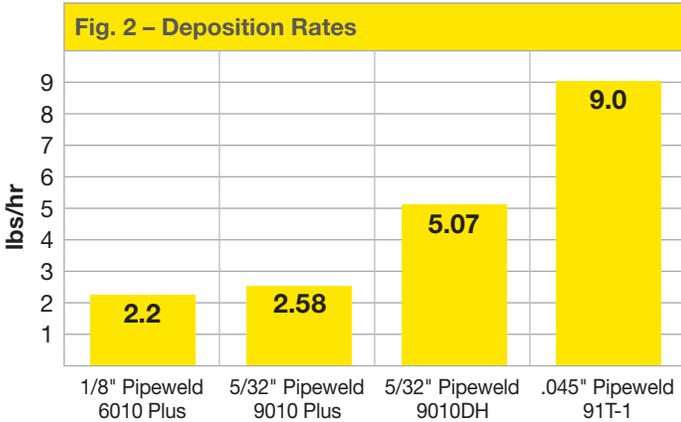


BENEFIT #1

Pipeweld Orbiter Productivity

Pipeweld Orbiter combines the productivity benefits of mechanized welding with the high deposition rates and familiarity of flux cored welding. As shown in Fig. 2, an 0.045 in. (1.2 mm) flux cored wire offers deposition rates up to 9 lbs. per hour.

Further, the continuous nature of the flux cored process means operators only need to stop and remove slag at the completion of each weld pass, improving arc-on time.



BENEFIT #2

Working in Confined Spaces

Working in tight quarters like the water supply jobsite eliminates other mechanized welding options, but not Pipeweld Orbiter.

A lightweight bug and fast-fit band clamp onto any pipe with a diameter greater than 8 in. The bug contains the controls, wire spool holder, wire feed mechanism, torch, bug drive mechanism and cables and hoses, all connected as one unit. The same bug works on both sides of the pipe, and it works with any CV power source that provides sufficient output for the wire selected.



BENEFIT #3

Zero Weld Defects

ESAB's complete pipeline solution and 3-run procedure (Fig. 3) improve first-pass weld quality five ways.

1. Depositing a layer of weld metal with the low-hydrogen Pipeweld 90DH eliminates the gas pops or blowholes caused by a "2-run" procedure, which use a flux cored wire directly after the cellulosic hot pass.
2. Easier cleaning – just remove Pipeweld 90DH slag with a wire brush or chipping hammer. Conversely, the 2-run procedure requires deep grinding to mitigate the high moisture content of the cellulosic coating, wasting time and filler metal.
3. ESAB formulated Pipeweld T-1 specially for mechanized pipe welding. The fast-freezing flux supports the weld puddle in all positions without affecting puddle fluidity while maintaining the desired penetration profile.
4. Operator-friendly system. A hardwired pendant control enables the operator to observe the weld puddle and make on-the-fly adjustments to travel speed, oscillation width or contact tip-to-work distance.
5. Simple training. Because of the familiar flux cored process and simple controls, contractors can train operators in one day or less, then deploy them for immediate productivity.



Fig. 3 – ESAB 3-Run Solution

| Process | Bead Location | Filler Metal | Diameter | # Passes | Total Time |
|--------------|---------------|--------------------|-------------------|----------|---------------|
| Cellulosic | Root Pass | Pipeweld 6010 Plus | 1/8 in. (3.2 mm) | 1 | |
| Cellulosic | Hot Pass | Pipeweld 9010 Plus | 5/32 in. (4 mm) | 1 | |
| Low Hydrogen | First Fill | Pipeweld 90DH | 5/32 in. (4 mm) | 1 | |
| FCAW | Fill/Cap | Pipeweld 91T-1 | .045 in. (1.2 mm) | 7 | 6 hours/joint |

Contact your ESAB sales representative to learn more, or visit esab.com/pipelines



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