

# Aluminum Arc Welding Case Study

## Project Challenges

- Provide a flexible robotic welding system to automate welding of new designs of fence posts and gates.
- Provide a complete turnkey robotic welding system that is able to accommodate xx variations of parts with minimal tooling change over.
- Large awkward parts consist of .250" aluminum welded to .060" aluminum tube and .020" wall tube welded to .125" aluminum extrusions.
- Each gate requires up to 28 individual welds.
- Improve productivity and shorten lead time
- Reduce dependency on offshore suppliers
- Make aesthetically pleasing welds on the outside of the fence post and foot that do not need to be ground down prior to painting.
- Outside surface condition and visual condition from the weld joint on the inside mounting plate is critical.

## KC Robotics Solution

KC Robotics provided a pre-engineered welding system, KCR Systems 300 cell including:

- KUKA KR16 L6 Robot, an extended reach robot with controller and base riser
- (2) 500kg headstock / tailstock positioners
- Fronius TPS GMAW digital welding power supply, integrated welding package with 500A
- 500lbs. bulk wire feeding system
- Automatic wire cutter and torch reamer
- (2) operator station (one per welding station). Functions: Cycle Start, Emergency Stop, Hold, Alarm Reset
- System Safety Package, including Safety fencing, light curtains, safety interlocked access gates. Meets ANSI/RIA R15.06-2012 standard.

## Fixtures / Tooling Details

KC robotics provided manually operated welding fixtures for the fence post welding operation that is able to accommodate 5 posts per cycle.

KC Robotics provided a welding fixture that combined both manual and automatic clamping for the gates. The fixture was designed and built for a quick changeover to 3 different styles and 4 sizes within those styles.

## Project Results

- The robot system meets or exceeds all the project goals. It allows the customer to build the parts needed for the product launch in house in one shift and have the additional capacity for future growth.
- The system requires 1 operator vs 4-6 skilled welders.
- Flexible system accommodates several models and allows large and small batch runs with easy changeover.