Robo Pipe™ from Lincoln Electric Automation is a versatile, easy to use, cost effective and highly productive pipe welding system that is ideal for pipe fabricators. The Robo Pipe™ system takes the capabilities of Lincoln Electric’s revolutionary Power Wave® 455M/STT® Robotic power source and combines them with an easy to use industry-leading robotic welding system.

Unique power source features such as STT® (Surface Tension Transfer®) and Waveform Control Technology® provide the capability to make open root welds with STT® and change “on the fly” to pulse spray GMAW (MIG) for the hot, fill and cap passes. Welding procedure flexibility in an easy to operate robotic system is why Robo Pipe™ is an unmatched automated welding solution for the pipe industry.

**BENEFITS**
- Shorter Cycle Times
- Excellent Bead Contour
- Reduced Cleaning
- Root Fusion
- Less Grinding
- Consistent Weld Quality

**MATERIALS**
- Carbon steel
- Stainless steel
- Duplex stainless steel

**SPECIFICATIONS**
- Pipe or Column Diameter: 5/8 inch to 45-1/4 inch with Model “B” 3-Jaw (HE) Chuck.
- Segment Length: up to 20 feet or up to 60 feet, depending on system configuration.
- Positioner Torque: 6,200 in.-lbs., 15,000 in.-lbs., or 50,000 in.-lbs.
- Welding Power Source Rated DC Output: 450 Amps, 38 Volts, 100% Duty Cycle.
- Workstation: One- or two-axis.

**TOLERANCES ON JOINT PREP**
- Root Gap: 2-3 mm
- Land Thickness: 0-2 mm
- Misalignment: 1/2 Root Gap

www.lincolnelectric.com/automated-solutions
**POWER WAVE® 455M/STT® ROBOTIC: HIGH PERFORMANCE INVERTER-BASED POWER SOURCE**

The Power Wave® 455M/STT® Robotic is a proven inverter-based power source that is ideal for the pipe welding industry. The 455M/STT® is loaded with Nextweld® technologies including Lincoln Electric’s proprietary Surface Tension Transfer® (STT®). STT® provides precise heat input control, minimal distortion and reduced spatter, characteristics that can improve the quality and efficiency of open gap root pass welding.

In addition, the reliability, durability and performance capability of the Power Wave® 455M/STT® Robotic make it the premier choice for satisfying the high duty cycle demands of robotic welding applications.

**MORE ABOUT STT®**

The STT® (Surface Tension Transfer®) process permits open gap root pass welding of pipe with greater ease of operation, consistent back beads and edge fusion, and less spatter and smoke than other available welding processes. STT® is different from traditional short arc MIG (GMAW) welding in that the current is precisely controlled independent of the wire feed speed. The traditional violent short arc “fuse explosions” are eliminated. This reduces the weld puddle agitation, spatter and smoke and provides increased control over the puddle and penetration.

**ROBOTIC SYSTEM FEATURES**

- FANUC Robotics ARC Mate® IC arm & Teach pendant.
- ArcTool™ welding software.
- Multiple E-Stop Locations.
- Welding schedules including: Voltage, Current, Wire Feed Speed, Torch Angle, Weave Width and Frequency, Travel Speed.
- Customized pipe welding program logic.
- Memory card.
- Ability to save approximately five hundred (500) complete pipe welding programs.
WHAT OPTIONS ARE AVAILABLE WITH ROBO PIPE™?

- Manual Seam Tracking via “Joy-Stick” Control and Through Arc Seam Tracking (TAST) allows an operator to move the robotic torch, both vertically and horizontally, to keep the weld pool in line with the joint.
- Through Arc Seam Tracking (TAST) can be enabled once the robot begins welding, after the root pass. The robot weaves across the weld joint and modifies its path based on any out-of-roundness or joint location shift.
- Adaptive Welding using Laser-Based Vision Tracking, also known as Joint Tracking, involves real-time tracking just ahead of where the weld is being deposited. This allows for not only robot trajectory shifts, but also adaptive control such as adjustments to voltage, wire feed, travel speed, or weaving to change weld bead deposition.

- Synchronized Tandem MIG®
  Tandem MIG® is a dual wire, high productivity MIG (GMAW) process which utilizes high-speed inverter waveform control technology to coordinate two separately generated GMAW welding arcs in unison for exceptional process flexibility.
  - Employs two electrically isolated wire electrodes positioned in line, one behind the other, in the direction of welding.
  - The first electrode is referred to as the lead electrode and the second electrode in line is referred to as the trail electrode.
  - The spacing between the two wires is usually less than 1/2 inch so that both welding arcs are delivering to a common weld puddle.
  - The function of the lead wire is to generate the majority of the penetration, while the trail wire performs the function of controlling the weld puddle for bead contour, edge wetting and adding to the overall weld metal deposit rate.

ROBO PIPE™ FAQ’S

What can Robo Pipe™ do for me?
Robo Pipe™ can weld about 80% of normal pipe shop production, and the flexibility of a robot arm accommodates welding on fittings such as Weldolet, Sockolet, Thredolet, Nipolet, Latolet, Elbolet, and others.

What type of joint preparation is required?
- Robo Pipe™ is designed to operate with an open root of 3/32 inch (3 mm) and a 30 or 37.5 bevel (60 - 75 degree included angle).
- Flame-cut, hand-ground or machined bevels are all acceptable.
- The Surface Tension Transfer® (STT®) process is very tolerant of joint preparation variation.

What other preparation is required?
- All joints need to be tack welded, typically in four places per joint.
- In order to ensure X-ray quality welds, Robo Pipe™ requires full penetration tack welds that are ground thin and additionally prepped to a tapered profile to insure a smooth root pass transition.
- It is common for operators to tack weld the joints to a near-closed root gap, and then mechanically open the joint using a hand grinder and a 1/16 inch cutting wheel.

What are limitations for Robo Pipe™?
Saddle welds and Miter welds can be accomplished on fittings, but are not recommended for pipe to pipe connections due to robotic torch interference and programming complexity.
Robo Pipe™
Robotic Pipe Welding for High Productivity

VERNON TOOL™ PIPE AND TUBE CUTTING

(MPM) Flame-cutting Machines for Pipe-only
- VERNON Tool™ Flame-Cutting Machines can supply enough pipe to satisfy 5 to 10 fit-up and welding stations.
- Product range accommodates up to 60 inch diameter pipe.
- CAD-CAM compatible.
- An excellent tool to improve the speed and repeatability of each contour to feed Robo Pipe™ systems.

(VAS) Abrasive Saw for pipe-only
- Pipe sizes: 1-24 inches O.D.
- Semi-automatic material handling.
- Uncontaminated machine-like finish on all pipe materials.

(MTC) Plasma-profiling for Round and Rectangular Tubing
- Accommodates up to 6 inch circular tube.
- Accommodates up to 4 x 6 inch or 5 x 5 inch rectangular tube.
- Min -max tube length is 14 - 44 ft.

WORLD-CLASS WELDING AND AUTOMATION EXPERTISE
Lincoln Electric’s strategic alliance with FANUC Robotics translates into an unparalleled combination of welding and robotics expertise, plus single-source efficiency. Whether you’re considering your first automated cell, or you’re ready to upgrade or enhance your existing robotic systems, there’s no better partner than Lincoln Electric and FANUC Robotics.

EXCEPTIONAL CUSTOMER SERVICE
Lincoln Electric and FANUC Robotics have a global network of facilities and people to provide quick response and personalized attention. No matter where your welding operations are located today, no matter where they will be tomorrow, Lincoln Electric welding experts can provide local support, ready to create and implement solutions that fit your needs.

VALUABLE CUSTOM SOLUTIONS
While Lincoln Electric offers a wide spectrum of pre-engineered systems, we also offer the ability to modify or completely customize the creation of your weld cell to meet your precise needs. Contact us today!

PIPE WELDING CONSUMABLE SOLUTIONS

MIG Wire Solutions
Pipeliner® 70S-G has a low silicon level for unblemished welds with less clean up required. Provides good back bead shape when using the STT® process on root passes. It is recommended for root pass welding of up to X100 grade pipe as well as hot, fill and cap pass welding of up to X70 grade pipe.

Pipeliner® 80S-G is the highest strength all-position MIG wire in the Pipeliner® family. Recommended for root pass welding of up to X100 grade pipe as well as hot, fill and cap pass welding of up to X80 grade pipe.

For more information request publication C1.100.

CUSTOMER ASSISTANCE POLICY
The business of The Lincoln Electric Company® is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or advice about their use of our products. Our employees respond to inquiries to the best of their ability based on information provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or advice. Moreover, the provision of such information or advice does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or advice, including any implied warranty of merchantability or any warranty of fitness for any customer’s particular purpose is specifically disclaimed.

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