



ROBOTIC SOLUTION

FLEX-FAB ROBOTIC WELDING CELLS

www.lincolnelectriceurope.com



HIGH PRODUCTIVITY SOLUTION



**POWER WAVE®
R450**

TOTAL SOLUTION

MAXIMIZE YOUR WELDING TIME



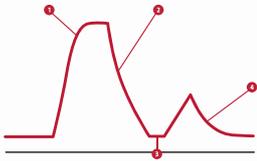
- Complete wire feed system solution for bulk packaging

FUME EXTRACTION



ADVANCED PROCESSES

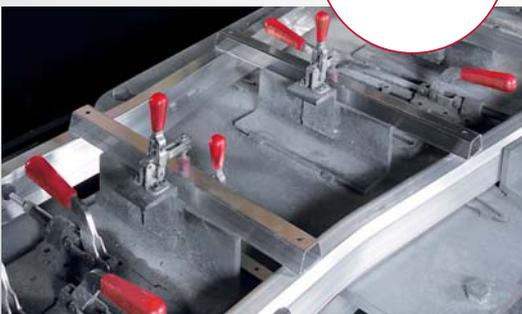
RapidArc® waveform
Rapid X® waveform



1. Pulse Ramp / Peak 2. Tailout 3. Wet-in 4. Puddle Repulsion

- Unique waveforms for cost reduction and quality improvements

FIXTURE



SOFTWARE SOLUTIONS

- Take full control of welding process

Syncs with **CHECKPOINT**



BOOST YOUR PRODUCTION CAPACITY WITH ROBOTIC WELDING TECHNOLOGY



It used to be that the application of robotic welding only made sound financial sense for high-volume production processes. Not so today. Recent adaptation in robotic welding technology has made automation a real no-brainer, helping operations of all sizes and spectrums manage through an increasingly volatile and competitive manufacturing climate. Lincoln Electric offers a total solution for robotic welding, key to optimize productivity, flexibility and quality for welding applications in metal construction and manufacturing.

FLEX-FAB Robotic Welding Cells are offering the latest technology:

- Performing robot with several features and options
- Advanced welding equipment with a large choice of MIG/MAG processes
- Fume extraction and filtration for a better environment
- Optimized wire feeding system with high quality consumables
- Fixture on demand, depending on the application
- Assistance, service and maintenance of your equipment
- Software solutions to manage data and traceability



**FLEX-FAB
ROBOTIC
WELDING
CELLS**

AN OPTIMAL RANGE FOR SMALL TO MEDIUM PARTS

With our Flex-Fab robotic welding cells, we have engineered newer, more advanced and more affordable robotic systems to support manufacturers of all sizes – from the small shop owner to medium part supplier. An automated robotic welding cell can help you speed up production, reduce labour costs, improve weld integrity and consistency, and reduce downtime.

FLEX-FAB – FT-DS

Benefits:

- Ideal for welding small to medium-sized parts that do not require rotation or repositioning
- Minimal installation
- Improves productivity, quality and safety

Examples of Manufactured Parts:

- Enclosures and boxes, such as electrical panels
- Food service equipment
- Miscellaneous: small brackets, handrails, education institutions



FLEX-FAB – XFT

Benefits:

- Single load and unload area with two independent work zones
- Turntable system provides 180-degree rotating work area for increased throughput efficiency
- Ideal for small- to medium-sized parts not requiring reorientation
- Promotes optimum use of floor space
- Servo-driven positioner has no mechanical components and is nearly maintenance-free

Examples of Manufactured Parts:

- Construction equipment, such as subassemblies, cylinders
- Heat exchangers
- AC ventilation
- Foodservice equipment
- Miscellaneous: brackets, satellite dish brackets, rebar brackets, couplers, stair treads



All cells include:

- 2 work stations
- **Hollow wrist ABB robot**
- AutoDrive 4R220 wire feeder
- **POWER WAVE R450** power source
- Cooler unit
- Water cooled torch 500A
- Torch cleaner and lubricator
- Fencing protection
- Vertical light curtain (except FT-DS)

FLEX-FAB – XHS300 FLEX-FAB – XHS600

Benefits:

- Enhance part production by improving productivity, quality and safety
- Dual zone with a rear-mounted robot on an H-Frame positioner
- 180-degree rotation for single load/unload access point
- Smaller arm and system footprint produces higher throughput rates
- Optimized to maximize the work envelope of the robot

Examples of Manufactured Parts:

- Agricultural Equipment
- Recreational Vehicles: cart frame, hitches and components
- Miscellaneous: office furniture, door window frames, water heaters



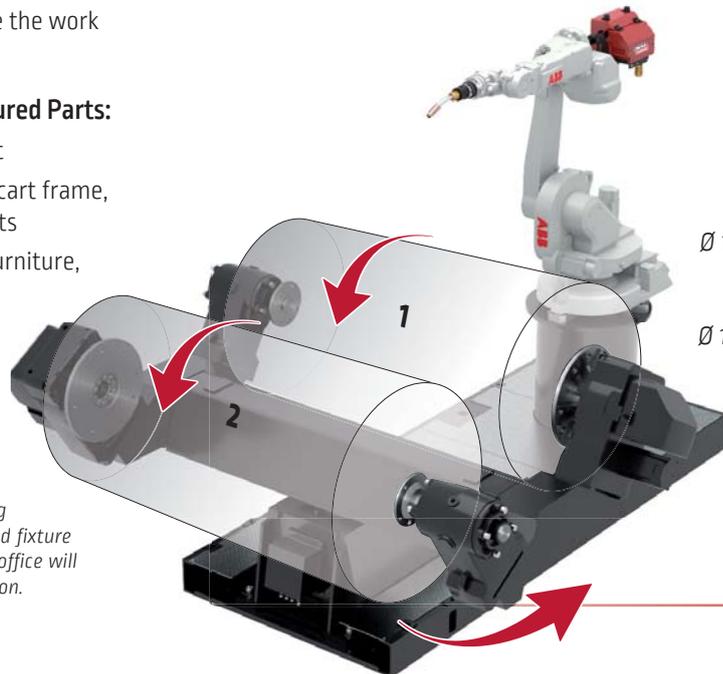
1 rotating table
with 2 headstocks
for 2 work envelopes.

XHS300

Ø 1000 - L= 1600 mm - 300 Kg*

XHS600

Ø 1200 - L= 2000 mm - 600 Kg*

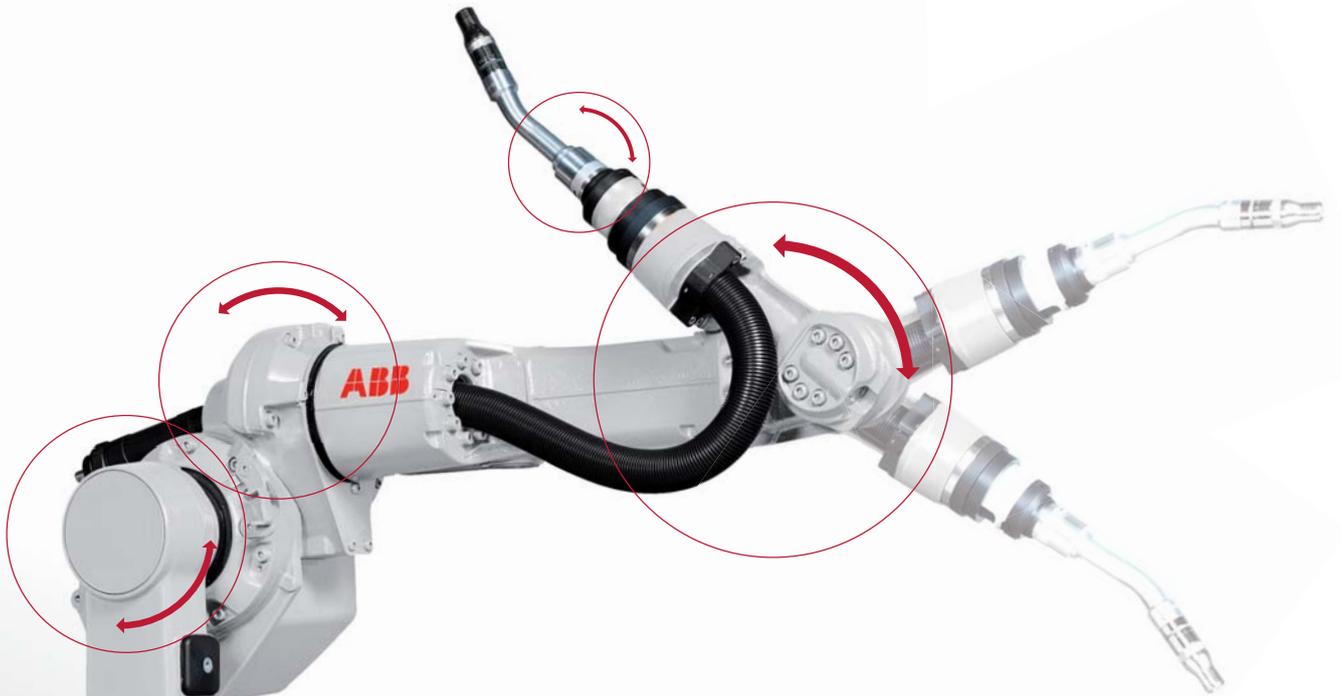


* Theoretical envelop depending on the part to be welded and fixture size. A study by our design office will define the exact configuration.



HIGH PERFORMANCE ARC ROBOT

6-axis high performance and versatile robot IRB 1660ID (or IRB 2600ID for the Flex Fab XHS 600), suitable for arc welding with a compact arm and very powerful motors allowing fast movements, quick acceleration and maximum speed at all times.



HOLLOW WRIST ROBOT

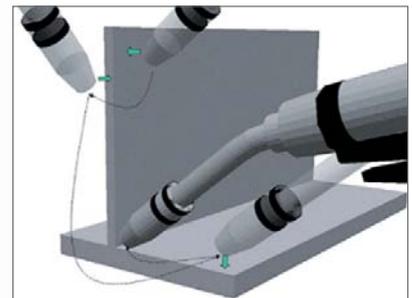
Cables and hoses of the the torch are inside the hollow wrist, which improves overall access, reduces the risk of deterioration, extends its life and therefore decreases the maintenance cost of the installation.

TRUEMOVE™

TrueMove™ technology and the new motion mode in precision mode, provide 0.05mm track repeatability for excellent welding results.

SMART TAC

SmartTac is a flexible, versatile system that searches for and locates weld joint positions using its electronic sense of "touch". This allows the robot to adapt its trajectories relative to the workpiece.

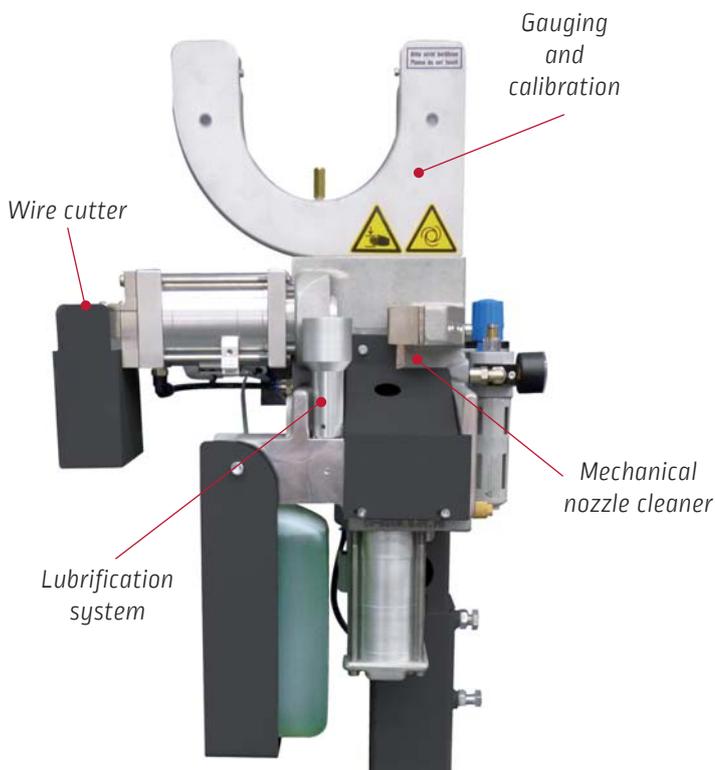


TORCH SERVICE CENTER

The robot cell includes a cleaning station for the torch with lubrication of the nozzle to avoid spatters accumulation.

In addition, the Torch Service Center can be equipped with:

- A gauging and calibration system to guarantee the robot tool center, after a shock, a change of consumable or torch neck
- A wire cutter to ensure exact and consistent stick out

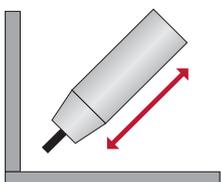


TORCH SERVICE CENTER WITH FULL OPTIONS

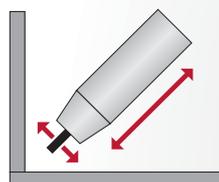


WELDGUIDE IV

Weldguide IV is a powerful "Thru-Arc" seam tracking based on patented technology and designed for robotic welding systems. It is designed to track the difficult changes in welding joints resulting from molded or other components.



Height probing
The distance torch / piece is kept constant



Centering on the joint.
The position can be adjusted on each side

EQUIPMENT SOLUTION

POWER WAVE® R450



- High-performance, reliable robotic welding
- 450 A at 100% duty cycle
- Output range: 5-500 A
- Ideal for: Robotic, General Fabrication and Heavy Fabrication Applications

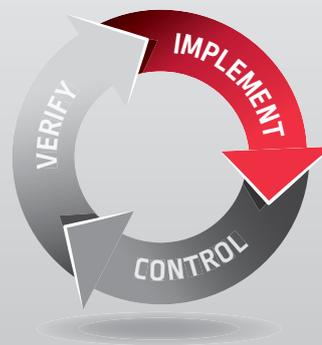
Power Wave® Process Control operates on three principles

It's no secret that the mindset of continuous improvement is a proven approach for improving production efficiency, quality and profitability – so why not view your welding operation the same way?

Lincoln Electric's Power Wave® advanced welding system allows you to do just that. Power Wave® is more than just a welder, it's a complete process control platform that provides a full view of your welding operation, giving you the tools you need to deliver continuous improvement of safety, quality and productivity.

VERIFY

Productivity and Quality Monitoring



IMPLEMENT

Optimized Arc Performance

CONTROL

Process Standardization & Repeatability



AutoDrive 4R220

- Powerful and dependable robotic wire feeders
- Patented MAXTRAC® 4-roll drive system
- Best in class torque for high-speed applications
- Precise speed control



Cool Arc 50 cooler

- Suitable for the Power Wave range.
- Robust and reliable design for cooling welding torches up to 500A

STT® Module

- Expand welding capabilities
- Ideal for productivity and quality improvements with STT® welding and Rapid X®



Advanced Module

- Further expands welding capabilities
- Ideal for: Adding AC polarity, STT®

INFORMATION THAT LEADS TO SOLUTIONS



The success of every operation, big or small, depends on making the best weld in an efficient way, with zero defects, while meeting customer demand. Do you know and understand the true performance of your welding operations? Relying on traditional methods to collect and analyze operator metrics is too burdensome and often doesn't provide a true representation of your entire welding operation.

Power Wave's® advanced production monitoring technology allows you to easily break away from old methods with an intelligent, IoT driven platform. By providing a complete, real-time view of your entire welding operation, the Power Wave® platform provides the precise information you need to make data-driven decisions for continuous improvement.

CHECKPOINT®

The Right Data, The Right Decisions

- More than data collection
- Full production monitoring production

With Checkpoint® you can:

- Identify the **TRUE COST** of welding
- Evaluate the **TRUE QUALITY** of welding
- Deliver the **TRUE PERFORMANCE** of welding

Powerful Data Visualization

- Full visibility of your welding operation
- Real-time dashboard snapshots
- In-depth weld analytics

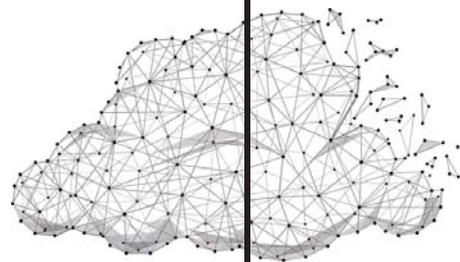


Easy Data Exporting

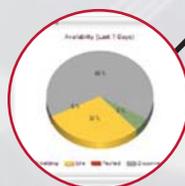
- Export the raw data
- Crunch the numbers the way YOU want



FOR MORE INFORMATION
SCAN HERE



ALERTS

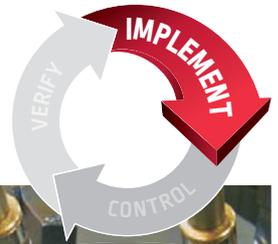


TRACEABILITY



PRODUCTION MONITORING

THE RIGHT PROCESS FOR ANY APPLICATION



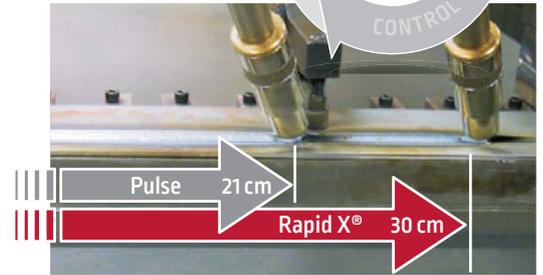
STEEL & STAINLESS STEEL

Rapid X®

High speed, low spatter, low heat input, no trade-offs

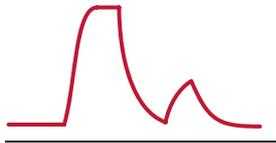


- Revolutionizes the productivity of welding
- Increase travel speeds by 40%
- Reduce spatter by 30%

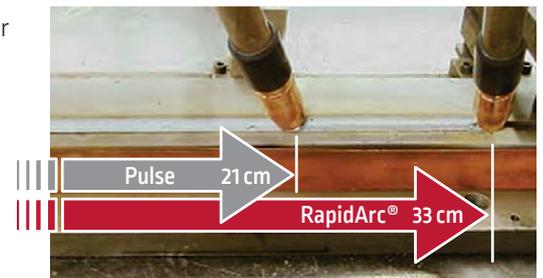


RapidArc®

Maximizing weld travel speeds

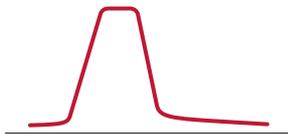


- Industry's premier waveform for high-speed welding
- Increase travel speeds by 50%
- Reduce spatter by 15%

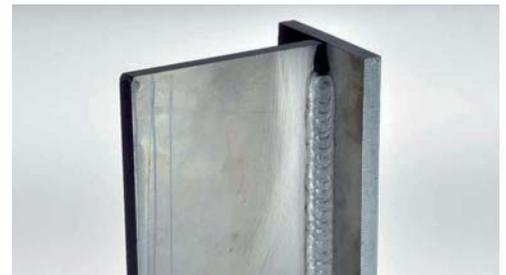


Precision Pulse™

Pulse performance for jobs demanding flexibility



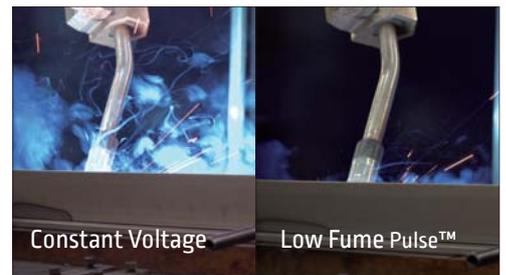
- Improved out of position welds over standard pulse
- Enhanced puddle control for improved operator confidence
- Controlled heat input
- Improves welds in tight joints



Low Fume Pulse™

A better weld. A better work environment

- Maximizing operator appeal and arc forgiveness.
- Reduction in fume generation by up to 66% compared to CV
- Excellent arc stability
- Extremely low spatter generation



66% Reduction of Welding Fume*

* 66% Fume Generation Reduction (grams/minute) based on 1,32 mm wire at 10 m/min - same gas, wire diameter, wire feed speed, contact tip to work distance.

COATED STEEL

Rapid Z®

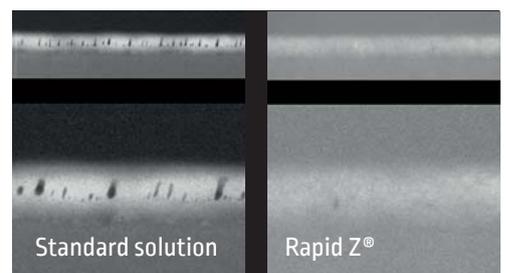
Lowest porosity, highest speed



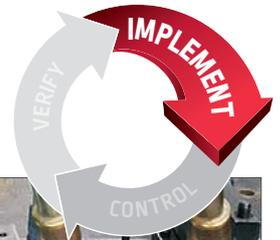
- Reduce internal and external porosity while maintaining high travel speeds
- Improved bead appearance



MORE INFORMATION IN RAPID Z® BROCHURE



THE RIGHT PROCESS FOR ANY APPLICATION



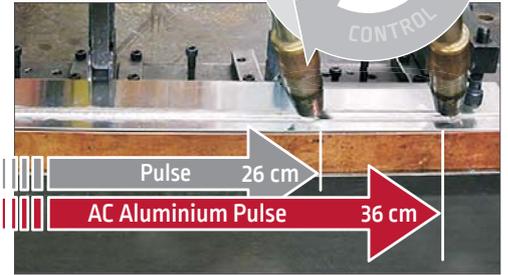
ALUMINIUM

AC Aluminum Pulse

Improved aluminum productivity and quality

- Increase travel speeds by 40%
- Increase deposition by 75%
- Improves gap bridging capabilities
- Decrease burn-through

UltimArc® Control



Power Mode®

The universal mode for tough applications

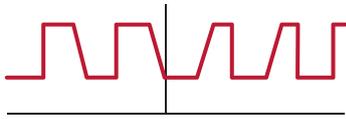
- Provides stable arc performance and less current fluctuation
- More consistent weld penetration
- Fewer fusion defects in welds

Excellent performance – thin to thick material



Pulse-on-Pulse®

TIG appearance. MIG productivity



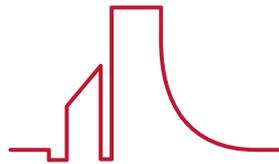
- Excellent heat input control especially on thin materials (less than 7 mm thick)
- Eliminates in-line weaving
- Improve operator appeal for any skill level
- Use when appearance and productivity matter using aluminum



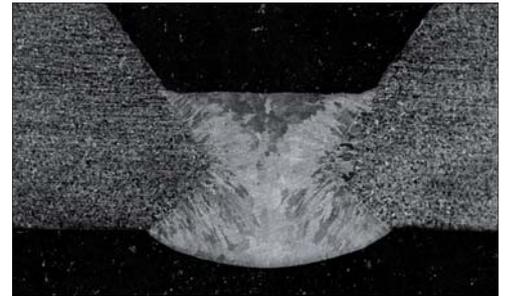
STEEL, STAINLESS & NICKEL

STT®

Industry proven root pass solution



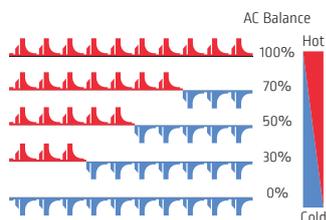
- Simplify open root welding for any operator skill level
- Eliminates common burn-through & lack of fusion issues.
- Larger bead, flat face, perfect back bead, excellent fusion



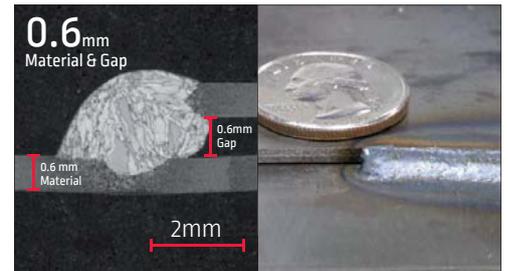
STEEL

AC-STT™

Industry's superior thin gauge solution



- Proven STT® waveform with controlled AC balance
- Excellent heat-input control
- No burn through, no spatter



SUPRAMIG® HD

THE NEW DIMENSION IN ARC STABILITY AND IGNITION

A NEW advanced lubricant, which evaporates from the hot wire directly after touching the work piece, supporting the ionization of the air and aiding in a very fast establishment of a stable arc, reducing spatter creation from cold wire tip ignition.



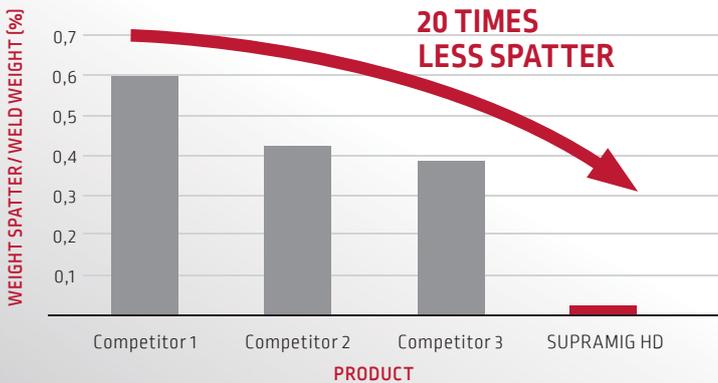
Arc establishment comparison of new engineered premium wire against competition - clearly demonstrating faster arc establishment

5 TIMES FASTER
FULLY ESTABLISHED ARC

LOW SPATTER LEVEL

The excellent starting behavior minimizes the level of spatter in intensive short weld designs and reduces dressing and reworking.

Normalized Spatter %



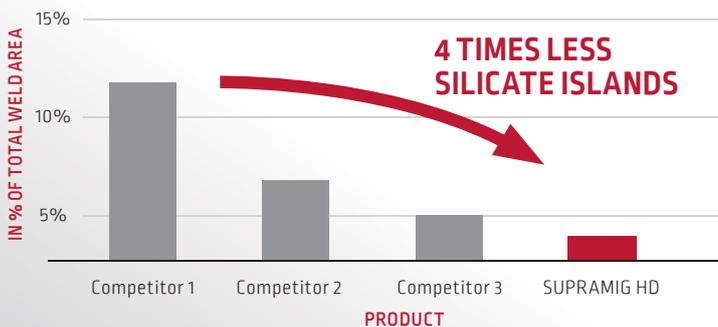
20 TIMES LESS SPATTER

USER ADVANTAGES:

- No components to rework
- Reduced change over/nozzle cleaning cycles
- Reduced jig and tools cleaning frequency
- Improved life of contact tip and nozzles and consistent gas coverage

MINIMAL SILICATE ISLANDS

Area of silicate islands

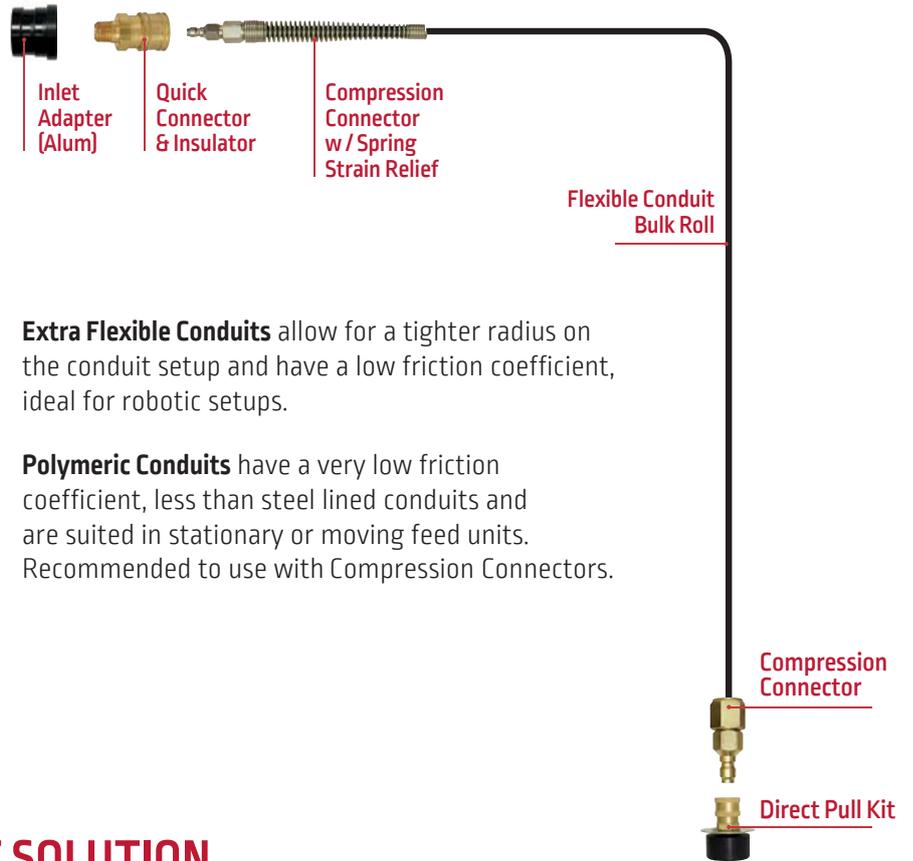


4 TIMES LESS SILICATE ISLANDS

USER ADVANTAGES:

- Welds ready for painting/ coating or surface treatment
- No rework
- No inter-run cleaning in multi-pass welding

OPTIMIZED WIRE FEEDING SYSTEM



Extra Flexible Conduits allow for a tighter radius on the conduit setup and have a low friction coefficient, ideal for robotic setups.

Polymeric Conduits have a very low friction coefficient, less than steel lined conduits and are suited in stationary or moving feed units. Recommended to use with Compression Connectors.

ACCU-TRAK, THE BEST SOLUTION FOR ROBOTIC APPLICATIONS

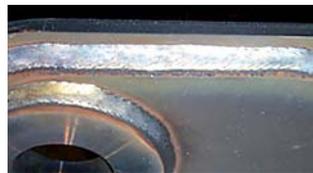
- Perfect and repeated wire placement on welding point
- No defect due to inconsistent wire positioning
- Less wasting time for repair & cleaning of parts
- Reduce production downtime
- WFS up to 15 m/min
- Deposition rate up to 10 kg/h

WIRE PLACEMENT

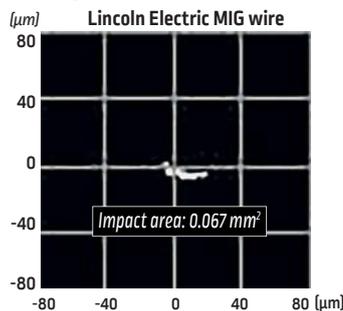
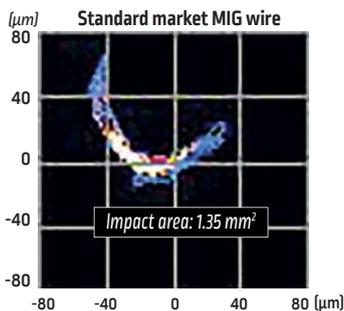
Example of bad wire placement



Example of good wire placement



Wire Placement Accuracy Test*



5 TIMES LESS WIRE DEVIATION

FIBRE HOOD COVER



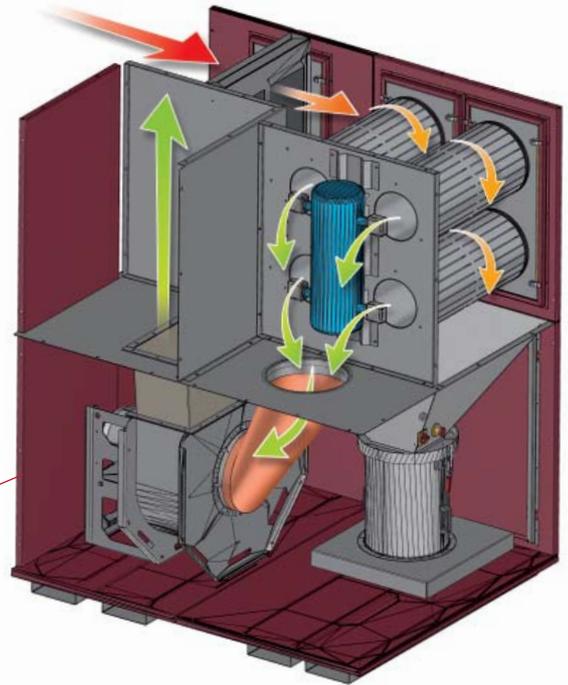
ACCU-TRAK
250 or 500 kg wire drum packaging

*Test measuring the wire placement area during 10 min of welding.

DIGIFILTER, YOUR AIR ENVIRONMENT UNDER CONTROL

The **DIGIFILTER** associated to a hood placed above the welding area provides a clean working environment.

- Automatic cartridge self cleaning
- Constant fume extraction air flow thanks to a sensor regulation
- Friendly user interface to control the status of the cartridges, the dust container and help for maintenance with events history



ALL IN ONE COMPACT AIR TREATMENT UNIT

- A spark arrester
- Filtration cartridge class H13 in compliance with EN 1822 standard (efficiency 99.9987%)
- Polyester PTFE membrane for a long life time
- Container for dust collection
- An extractor with frequency converter and PLC control

FIXTURING FOR ROBOTIC WELDING



The level of efficiency of automation depends on the thoughtful design of the fixturing for maximum productivity. Many productivity gains are realized at the design stage and while parts fixturing performs a role that is simple, good fixture design is critical to the success of a robotic welding system.

When we initiate a new project for robotic arc welding, we consider the following fixture design objectives:

- Optimize the welding circuit
- Orient the fixture to maximize process efficiency
- Strive for accessibility, repeatability, simplicity and dependability
- Consider alternatives when fixture design costs are prohibitive

CUSTOMIZED SOLUTIONS



Robolution™, a Lincoln Electric Company, is a full service automation integrator providing engineering, machining, and integrated robotic systems with core competencies in advanced welding system design, high-quality weld fixtures, robotic integration, process automation, and ongoing service and support.

Robolution™ is the specialist for customized solutions and high range of fixture systems.



From beginning to end, design - tooling - machining, Robolution™ completes each step in house.

That means total control over:

- Quality
- Lead time
- Cost
- Customer service

So that every step meets the customer's expectations.

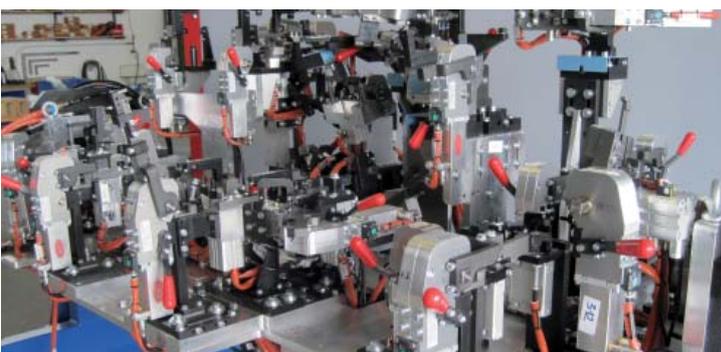
The team of professionals operates out of the headquarter in Weiterstadt, Germany but delivers on a global level as part of the Lincoln Electric Automation Group.

Robolution™ is a leader in the:

- Development
- Construction
- Installation
- Sales of robot systems and related components.

The product range includes robot systems incorporating high tech components and extends from standard items of equipment to fully automated, interlinked production lines. Robolution™ is a partner you can trust.

The individual products and installations help ensure the economic success of the customers. Long-lasting and technically faultless products and systems, as well as comprehensive service, are the fundamental elements which guarantee this.



BEING PRESENT LOCALLY MAKES US MORE AWARE GLOBALLY

120+
YEARS OF EXPERIENCE

325+
GLOBAL R&D TEAM



3.0
BILLION USD REVENUE

36
SOLUTION
CENTERS

11 000
EMPLOYEES WORLDWIDE

-  Global Headquarters
-  Solution Centers

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 customers' particular purpose is specifically disclaimed.

Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.eu for any updated information.



www.lincolnelectriceurope.com

