Increase Productivity with the World's First Collaborative Welding Robot
## WELDING AUTOMATION SOLUTIONS FOR YOUR INDUSTRY

Leverage our experience to solve your problems by moving to mechanized roll welding using the SWR

### IMPROVE YOUR BOTTOM LINE

- See **400%** increase in productivity (vs. SMAW)
- Deliver **90%** arc-on time
- Get a **75%** lower cost per joint (vs. SMAW)
- Increase production capacity by **50%** (vs. root to cap semi-automatic GMAW)
- Accomplish **30%** faster travel speeds (vs. root to cap semi-automatic GMAW)

### OPTIMIZE WELDING CAPACITY ON DEMAND

- Produce full Penetration X-ray quality welds
- Collect and preserve weld data to improve weld quality
- Reduce dependency on scarce, highly-skilled pipe welders
- Scale up quickly by easily training junior welders
- Increase capacity quickly through fast deployment
- Operational in just **5** days including a **2**-day installation

### SCALABLE AND REPEATABLE ARTISAN QUALITY

- Meet the requirements of ASME B31.1 and B31.3
- Deliver consistent high quality welds every time
- Meet key quality test requirements such as Radiography test, Charpy Impact test, Hardness test, Bend test, Tensile test, and more
- Choose between Fast (single pass) or Ludicrous Fast, using pre-programmed multi-pass welds
- Full control on the interpass quality
- Achieve defect rates lower than **1%**

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*Compared to SMAW*

**4x PRODUCTION INCREASE**

**6mo PAYBACK IN LESS THAN 6 MONTHS**

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**SMALLEST INDUSTRY FOOTPRINT**

**HIGH QUALITY WELD - EVERY TIME**

**MINIMAL WELDING EXPERIENCE NECESSARY**

**90% ARC-ON TIME**
GET THE NOVARC SPOOL WELDING ROBOT (SWR) ADVANTAGE

A patented welding technology that tackles your biggest challenges

**COLLABORATIVE WELDING ROBOT**
- Works with a junior operator
- Equipped with a powerful built-in safety system eliminating the need for hard fencing
- No need for special programming language to operate
- Fast and easy set-up

**ADVANCED WELDING FEATURES**
- Automatic root to cap welding without the need to shut off the arc
- Tack Fusion™, Root Save™ and Repeat Pass to accommodate tacks and fit-ups
- Capable of welding stringers and multipass joints

**SEMI-AUTONOMOUS**
- Semi-automated seam tracking using a laser scanner with 0.1 mm accuracy (for pipes up to 0.75” (1.9 cm) in thickness and more than 4” (10 cm) in diameter)
- Automatic stick-out distance control (tip to pipe distance) with 0.1 mm accuracy

**SMALL FOOTPRINT**
- Machine base and equipment require only a 4’ by 4’ (1.2 m by 1.2 m) area in the shop (vs. track mounted robots which need over 40’ by 10’ (12 m by 3 m) space)
- Does not block forklift traffic or interfere with shop flow
- Unique ability to weld joints on pipe spools up to 30’ (9 m) long

**OPEN PLATFORM**
- Ability to integrate with more than 2 positioners
- Easy integration with existing positioners
- Choice of power source

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**PRODUCTION MONITORING**
- **NovData™**: Provides supervisors with daily operations and log reports for future analysis
- **NovEye™**: A vision system built into the robotic arm which records each weld

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The Spool Welding Robot working with two positioners
THE SPOOL WELDING ROBOT (SWR)

Maximize pipe welding productivity

Easy-to-use Human-Machine Interface (HMI)
HMI allows operator to:
- Select the pre-programmed welding procedure
- Tune the weld and motion parameters
- Get access to the pass tracking feature and see the graphical representation of weld joint build-up during the weld

Slender design & compact head
- Only 1.6” (40 mm) clearance around the pipe is required

Three-axis robotic arm
- Imitates all roll welding motions
- Moves torch up/down, left/right while creating weave motion

Pneumatic manipulator with adjustable height
- Easily move the arm between joints within 15 ft (4.5 m) of base
- Approach a full range of pipes from 2” to 60” (5 cm to 152 cm) at different heights

A light and durable pendant
- Operators easily start, stop and change motion and weld parameters
- Includes:
  - 6.5” (16.5 cm) resistive touch screen
  - Hardwired safety rated E-stop
  - Easy-to-find rocker switches, push buttons and joystick

NovEye™
- Novarc’s AI-powered welding vision system

Laser Camera
- Tracks the seam in real time - no prescan

Point Laser
- Maintains the contact to work distance

Power Source
- Different power source options available
CUSTOMER TESTIMONIALS

"... these cutting-edge, collaborative robotic systems allow pipe welding tasks to be done dramatically more effectively and efficiently!"

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Seaspan’s Vancouver Drydock Company Ltd.
North Vancouver, BC

"We’re doing 200 diameter inches/day and getting 100% x-ray quality and we think we can get 300 with the right project."

Pipe Fabrication Shop Foreman

"The SWR is doing us a good job. My team is happy."

Pipe Fabrication Superintendent

"It’s a game-changer, and it’s welder friendly. We just have to figure out how to feed the machine faster."

Superintendent

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"The SWR would be my choice because it really takes all the hard work away from welding... I feel pretty comfortable using it. The support is great, a lot of help throughout. From the start they (Novarc’s team) have been there for everything."

Welder (Second year apprentice)

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"Since I am a welder, I know pretty well what somebody can get out of an 8 hour day; I think we can triple that with the SWR!"

Shop Superintendent

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"Once you get it dialed in, it’s the same weld every time with the same quality and consistency. It (the SWR) is head over heels better than manual welding; more efficient, more production and like I said, the quality is amazing."

Welder

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Superintendent
PRODUCTION INSIGHTS = TRUE BUSINESS ADVANTAGES

NovEye™ - World’s first AI-powered welding vision system

SEE MORE WITH NovEye™

- **NovEye™** is Novarc’s AI-powered welding vision system capable of recording every weld.
  
  With **NovEye™**:

- Operators get a clear view from inside the groove on the HMI as each weld progresses in real time.
- Supervisors get videos of all welds to analyze in parallel with the weld parameters saved by **NovData™** to improve weld quality.
- Operators can clearly see the effects and changes of the **Tack Fusion™** and **Root Save™** features.

“Novarc machine brings a new level of quality and consistency with every weld as well as an embedded video of the weld into the BIM model.”

Pitt Meadows Plumbing & Mechanical Systems Ltd.
PRODUCTION INSIGHTS = TRUE BUSINESS ADVANTAGES

NovData™ gives you all the data you need for quality control

GET SMARTER WITH NovData™

Novarc's proprietary comprehensive production monitoring software, NovData™, gives you the insights you need to scale your operation profitably. It automatically creates all the reports you need.

The reports include:

**Daily Operations Report**
- Operator name
- Number and sizes of pipes welded
- Job number
- Welding Procedure Data Sheet
- Total arc-on time
- Generated automatically everyday

**Log Report**
- 50 ms stamped values for voltage, current, WFS, travel speed, true energy and many other parameters
- Operators name
- Spool number
- Work order
- Date
- Time
- Welding Procedure Data Sheet
- **Plus, you get a record of the true heat input (true energy over distance travelled)**
- Generated automatically for each weld
SELECT SWR OPTIONS

MULTIPLE POWER SOURCES

- Lincoln Power Wave® R450 Robotic
- Miller Auto-Continuum™ 500
- Fronius TPS 400i LSC Advanced

WORKS WITH MULTIPLE POSITIONERS

- The SWR can easily be integrated to work with multiple positioners
- Novarc can also supply one or more positioners based on your need

ELECTRONIC WELDING REGULATOR (EWR)

- Saves shielding gas while providing better gas coverage
- Reliable, defined and verifiable
- Simple to install and works instantly

ARCHOOD™

- No need for welding helmets with Novarc's welding hood
- Easily and safely attaches to exhaust
- Patent pending

2D INDEXING TABLE

- Hardfacing (e.g. hardbanding) and alloy overlay (stainless, steel, nickel, etc.) applications

LASER-ASSISTED SEAM TRACKING

- Scansonic three-line laser
- For pipes with less than 0.75” (1.9 cm) in thickness and more than 4” (10 cm) in diameter

MANY MORE OPTIONS AVAILABLE!

CALL US +1 604.428.0050
ABOUT NOVARC TECHNOLOGIES

Founded in 2013, Novarc Technologies is a robotics company specializing in the design and commercialization of collaborative robots for industrial applications. Novarc’s Spool Welding Robot (SWR) is the world’s first of its kind in pipe welding application.

A proven pioneer in the field, Novarc has a dedicated team of robotic engineers, software developers, welders and scientists all eager to solve challenging industrial automation problems by working closely with pipe shops to improve customers’ bottom line.

CERTIFICATION

Complies with applicable European Community Directives including European Directives for Safety of machinery (EN60204-1), electromagnetic compatibility (EN61000-6) and safety of collaborative robots (ISO 15066-2016).

ABOUT THE SPOOL WELDING ROBOT (SWR)

Unlike other welding solutions, Novarc’s flexible technology is capable of welding a variety of joints, with fewer space restrictions, where operators interactively make adjustments during the weld without the need to pre-program.

Novarc’s team started developing the SWR by working closely with manufacturing shops struggling to automate the pipe spool welding process. Pipe shops were frustrated by the lack of industry innovation and believed that conventional six-axis robots were not feasible for pipe welding, and that robots on rails were too limiting and too expensive.

Then we got to work. Since then, we mastered the design and creation of a robot whose precision and dexterity matches the exact needs of pipe shops to get the job (and welds!) done.