

# LINCOLNWELD® EMERGENCE™

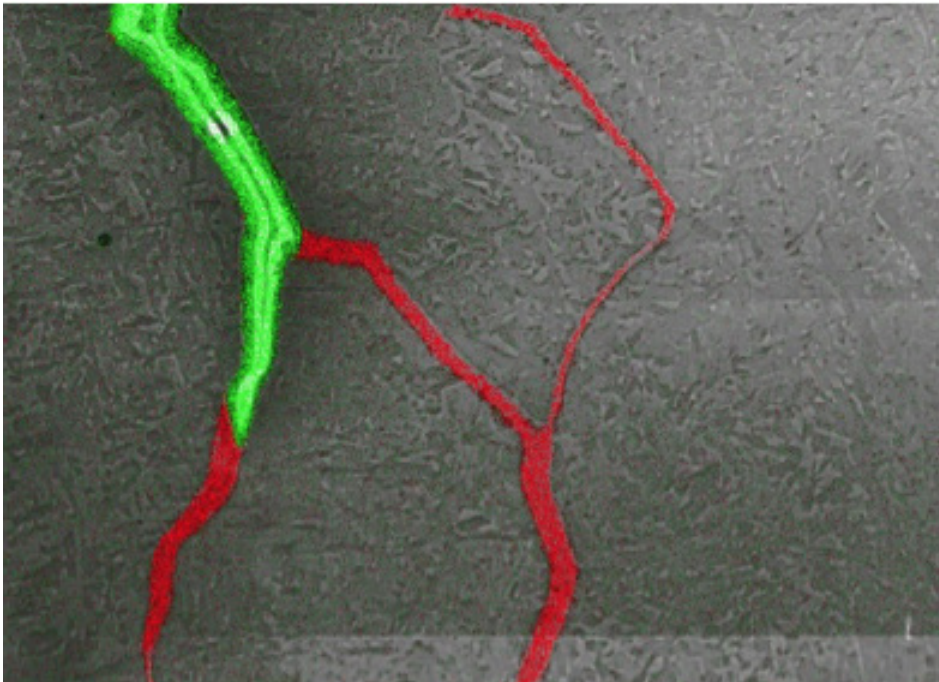
NON-COPPER-COATED SUBMERGED ARC WIRE FOR PIPE SEAM WELDING

**LINCOLN**®  
**ELECTRIC**



## Liquid Metal Embrittlement

Caused by molten copper wetting the steel grain boundaries at elevated temperatures.



Energy Dispersive X-Ray Spectroscopy (EDS) map showing copper (red) present along grain boundaries. Also shown is slag (green) which followed copper during the wetting process.

# Pipe Seam Welding

Lose the Copper.  
Keep the Quality.

Copper is not normally a problem in welding, however in the right situation it can cause Liquid Metal Embrittlement (LME), leading to costly downtime and repairs.

## Traditional Bare Wires are Not the Answer

Traditional bare wires suffer from severe tip wear, high diffusible hydrogen, pockmarking and decreased corrosion resistance.

## Beyond the Surface

Lincolnweld Emergence submerged arc wires feature a patented surface coating to address these issues.

*Take part in the next wave of pipe seam submerged arc welding. Take the next step with Emergence.*

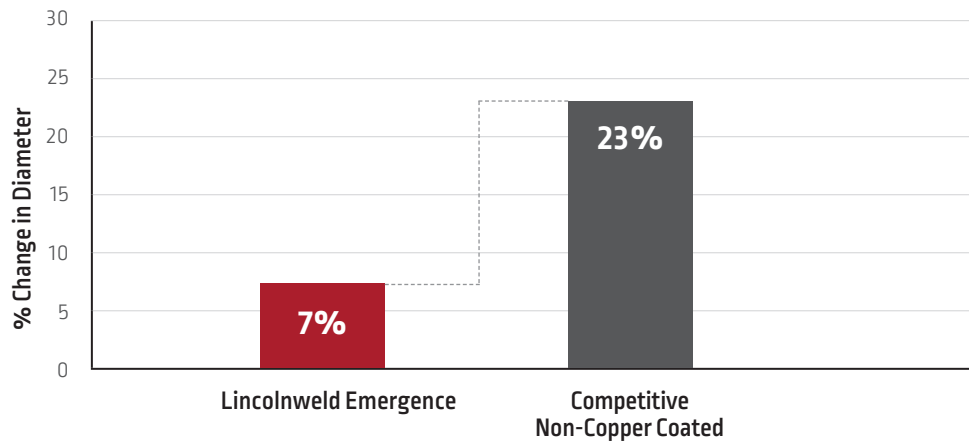
## DIFFUSIBLE HYDROGEN

	Copper Coated	Competitive Non-Copper Coated	Emergence
Typical Diffusible Hydrogen - mL/100g	3.5	5.0	3.6

Represents average diffusible hydrogen values from testing with multiple Lincoln Electric Fluxes

## Contact Tip Life<sup>[1]</sup>

Less Than Half the Tip Wear of Competitive Non-Copper Coated Wire



[1] Contact tips from welding with 900A DC+.

## Lose the Copper

The elimination of surface copper in Emergence decreases the risk of copper contamination in the weld. The wire's surface treatment also improves conductivity. As a result, Emergence's performance is equivalent to copper coated wires in the same alloy class.

## No Added Hydrocarbons

The Emergence surface treatment offers comparable corrosion resistance to copper coated wires, without adding hydrocarbons that could increase diffusible hydrogen levels.

## Long Contact Tip Life

With the Emergence surface treatment, copper tips wear at less than half the rate of competitive non-copper coated wires. That means avoiding an unacceptable number of contact tip change outs which result in excessive downtime and lost production.

## WIRE CONVERSIONS

Product Name	AWS Classification	ISO Classification	Equivalent Copper Coated Product(s)
Lincolnweld Emergence 60	EL12	S1	Lincolnweld L-60 LNS 143
Lincolnweld Emergence 61	EM12K	S2Si	Lincolnweld L-61
Lincolnweld Emergence 70	EA1	S2Mo	Lincolnweld L-70
Lincolnweld Emergence 73	EG (EH12K)*	S3Si	Lincolnweld L-S3 LNS 133-U
Lincolnweld Emergence 74	EA2	S2Mo	LNS 140-A
Lincolnweld Emergence 81	EA2TiB	SZ	Lincolnweld LA-81 LNS 140-TB
Lincolnweld Emergence 83	EG	SZ	LNS 133-TB
Lincolnweld Emergence 90	EA3K	SZ	Lincolnweld LA-90

\* Lincolnweld Emergence 73 uses the same green rod as Lincolnweld L-S3 and LNS 133-U, and has an AWS Classification of EG. Please call for additional information.

## RECOMMENDED FLUX

Product Name
• Lincolnweld 998N™
• Lincolnweld 995N™
• Lincolnweld 761-Pipe™
• Lincolnweld 761°
• Lincolnweld P223°
• Lincolnweld SPX80°

## PACKAGE OPTIONS

Package Type
• Drum
• Stem
• Spider Stem
• Reel

For additional wire diameters, grades and packaging, contact Lincoln Electric.

### TEST RESULTS

Test results for mechanical properties, deposit or electrode composition and diffusible hydrogen levels were obtained from a weld produced and tested according to prescribed standards, and should not be assumed to be the expected results in a particular application or weldment. Actual results will vary depending on many factors, including, but not limited to, weld procedure, plate chemistry and temperature, weldment design and fabrication methods. Users are cautioned to confirm by qualification testing, or other appropriate means, the suitability of any welding consumable and procedure before use in the intended application.

### 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.com](http://www.lincolnelectric.com) for any updated information.

Publication C5.10.45.B | Issue Date 04/17

© Lincoln Global, Inc. All Rights Reserved.  
[www.lincolnelectric.com](http://www.lincolnelectric.com)

**The Lincoln Electric Company**  
22801 St. Clair Avenue  
Cleveland, OH 44117-1199 U.S.A.