

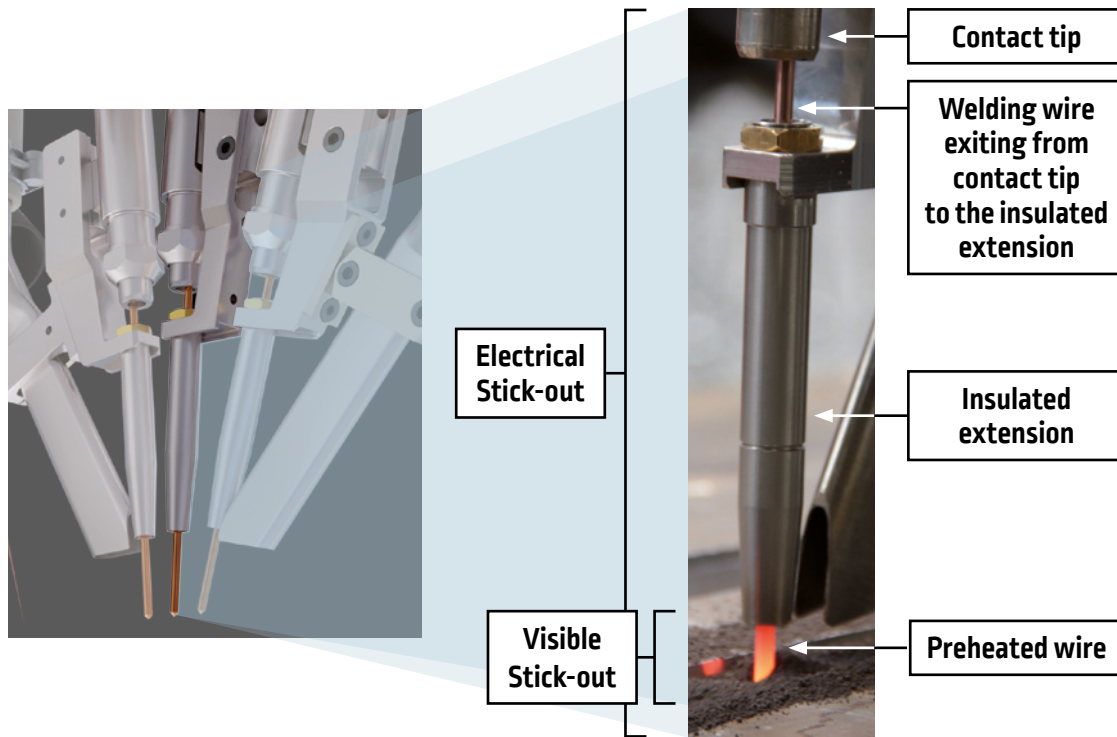
The image shows three welding torches in a dark industrial setting. Each torch is positioned vertically, and a bright orange-red arc is visible at the tip of each, indicating the welding process. The torches are arranged in a slightly staggered line. The background is blurred, focusing attention on the welding activity.

The Long Stick-Out (LSO) Submerged Arc Welding Process

Simple, flexible, robust and high efficiency SAW process

PRINCIPLE

The long stick-out (LSO) is a simple and very efficient submerged arc welding process that Lincoln developed to maximize customer's productivity. The principle is based on the natural resistivity of the welding wire. By increasing significantly the electrical stick-out, the wire is preheated and therefore is easier to melt. Thus, for a given amperage, the deposition rate can be doubled compared to a procedure made with conventional stick-out.



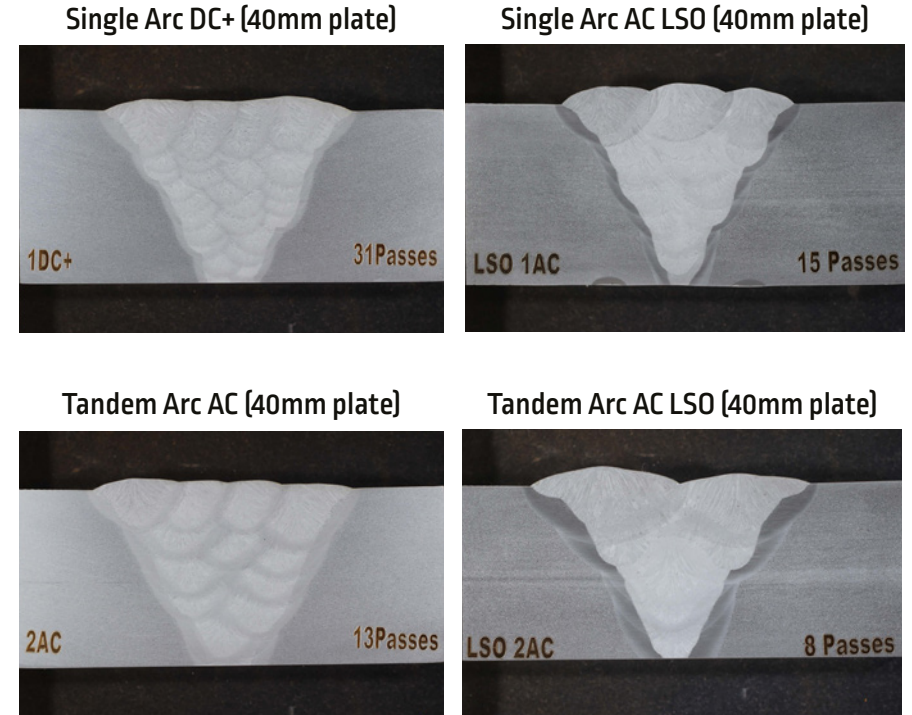
Operator friendly: The visible stick-out remains the same as for the conventional process. Only the electrical stick-out increases. It does not change his operating methodology.

EQUIPMENT NEEDED

Besides the Power Wave® AC/DC1000SD power source, the LSO head is the only required equipment to implement the Long Stick-Out process.

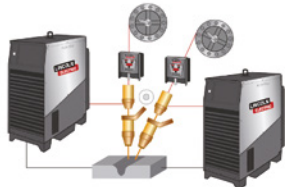


SAW PROCESS COMPARISON

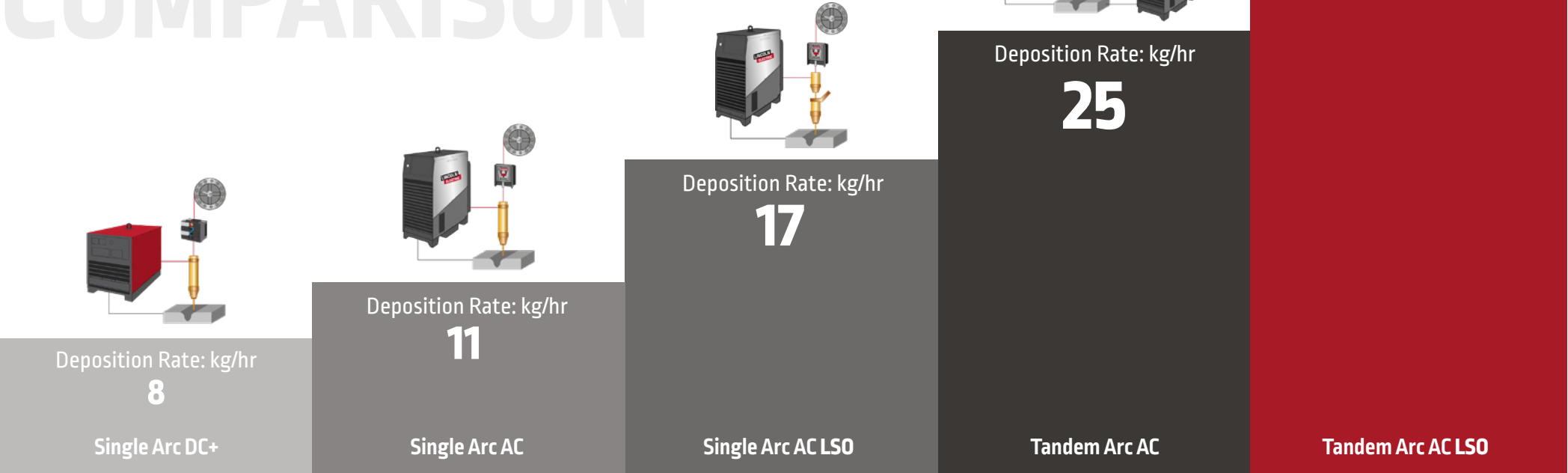


REDUCED ARC TIME HIGHER PRODUCTIVITY AND EFFICIENCY

- » The long stick out process is the most productive of the single power source processes.
- » With Tandem Arc AC LSO, over 196 hours can be saved per ton of welding wire deposited compared to Single Arc DC+



DEPOSITION RATE COMPARISON



250 hrs*

vs

182 hrs*

vs

118 hrs*

vs

80 hrs*

vs

54 hrs*

[Saved 68 hours]

[Saved 170 hours]

Saved 132 hours

Saved 196 hours

*Welding Cost Study - time to deposit 1,000kg weld metal at 50% operating factor

LSO PROCESS: SIMPLE AND FLEXIBLE

1) Arc configurations

Single arc



Tandem arc



Triple arc or even more



2) Joint designs

From 3 mm sheet plate to unlimited plate thickness:

- » Lap joint.
- » V Joint.
- » X Joint.
- » K Joint.
- » Compound joint.
- » Narrow U grooves.

CUSTOMER ASSISTANCE POLICY

The business of Lincoln Electric 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.

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www.lincolnelectric.eu

3) Welding positions

Applicable on longitudinal, circumferential, fillet and horizontal welds.

4) Materials

Applicable on mild, low alloy, high strength steels as well as on stainless steels.



Key features:

- » Robust, simple, flexible.
- » Lower flux/wire consumption ratio with LSO.
- » Insulated extension preventing from unintended arcing.
- » Copper free head and extensions.
- » Negligible investment for Power Wave® AC/DC 1000SD owners.

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