



## ESAB Retrofits Southeast Asia Wind Tower Fabrication Facility, Increases Deposition Rates Up to 400% with Integrated SAW System

- Tandem with ICE™ multi-wire SAW technology increases deposition to 34 kg/hr.
- Aristo® 1000 AC/DC power source improves deposition rate, heat input and bead profile.
- Seven ICE stations retrofitted on existing Laxa CaB systems.

### Situation

As Southeast Asian Nations set ambitious goals for renewable energy, the region's heavy industry corporations are responding by increasing wind tower production. One long-time ESAB customer with an installed base of more than 20 SAW systems recently won a contract for new towers. However, they struggled to meet delivery goals and were concerned about default payments for late delivery.



### Complication

The customer wanted to preserve as much of its existing SAW equipment as possible, but its current technology and procedures would not be able to meet demand.

### Solution

1. Retrofit four tandem arc systems on locally-built gantries.
2. Develop new high-deposition, high-speed WPS featuring Tandem with ICE submerged arc technology.
3. Install seven Tandem with ICE systems. These used existing LAF 1200 power sources for the DC lead arc and new Aristo 1000 AC/DC power sources for the ICE trail, PEK controllers and A6S weld heads.

### Results

Compared to single-wire DC technology, Tandem with ICE systems increased welding deposition rates decrease by 300 to 400%, increased travel speeds by more than 80% and flux consumption by 18% because it requires fewer welding passes.

## BENEFIT #1

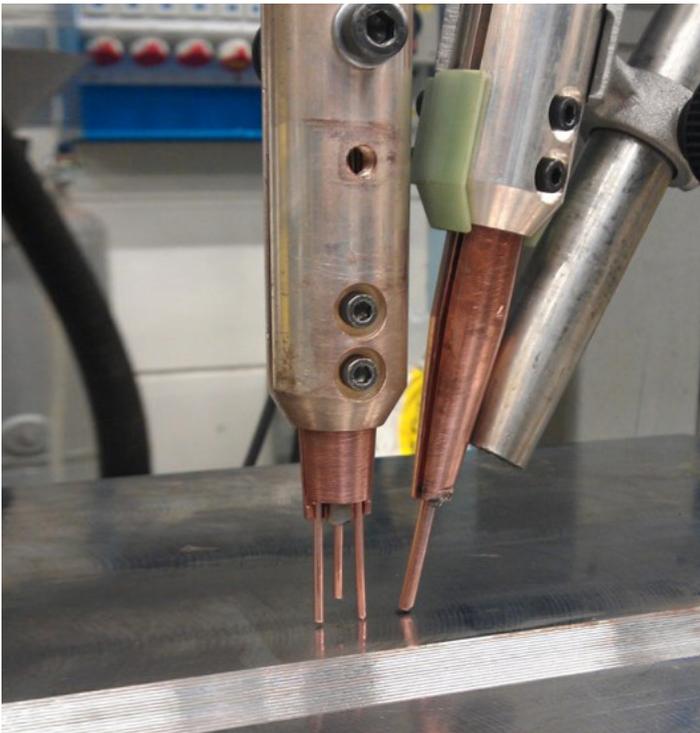
### 400% Productivity Increase

ESAB's Tandem with ICE solution offers an unbeatable combination of higher deposition rates, faster travel speeds and lower heat input to preserve mechanical properties. For the wind tower customer, the system featured a single 4 mm wire for the lead torch and an ICE trailing torch with three 2.5 mm wires. ICE features a single torch that feeds three wires, two of which are electrically hot. The welding heat melts a third, non-powered welding electrode (the "Integrated Cold Electrode") to deliver almost unbelievable results.

Where the customer's previous single-wire procedure deposited about 8 kg/hr of weld metal, Tandem with ICE systems:

- Increased deposition rates up to 34 kg/hr
- Increased travel speed from 550 mm/min. to 1000 mm/min.
- Never exceeded a heat input of 3.5 kJ/mm, which enhances weld strength

To provide the customer with peace of mind, ESAB compared its solution to conventional tandem twin technology. After learning how Tandem with ICE would deliver deposition gains of 59% and reduced welding time by 39%, the customer was convinced that investing in Tandem with ICE technology was the best solution for meeting production goals.

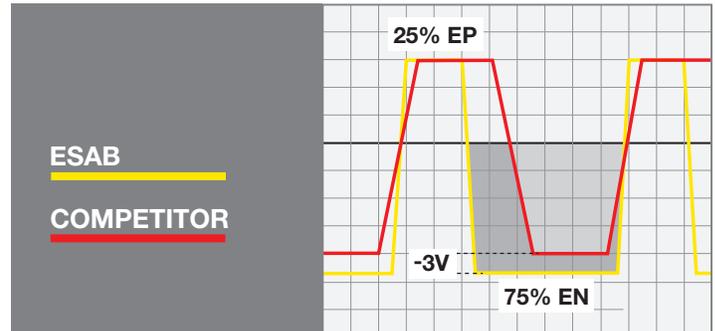


ESAB offers a full portfolio of filler metals and equipment for Wind Tower applications. Contact your ESAB sales representative to learn more, or visit [esab.com/windenergy](http://esab.com/windenergy).

## BENEFIT #2

### Unbalanced AC Technology

The Aristo 1000 features controls for AC frequency, balance and voltage offset (see graph). This lets users optimize the penetration profile, flatten the weld crown, deposit more weld metal and enhance the puddle stirring effect. The Aristo 1000 eliminates worries about AC arc stumpling, as its True Square Wave Technology™ drives the arc through the zero transition much faster than other systems. As an added benefit, its 0.88 electrical efficiency and 0.93 power factor lower utility bills.



## BENEFIT #3

### Confirmed Results

Wind tower sections for this customer had a circumference of 18 to 25 m and plate thicknesses ranging from 50 to 90 mm. Each joint requires up to 240 kg of weld metal and takes more than a day to complete due to cooling, interpass temperature and non-destructive testing requirements. Because rework can be very expensive and weld failures could be catastrophic, strict quality control measures are in place. This includes using an HSK WeldQAS quality assurance system to log data for voltage, current, travel speed and heat input at numerous points around the circumference, which gives the end customer confidence that the welds meet specifications.



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