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UPDATE

# First Powerwave AC/DC 1000 installed in The Netherlands

*HERSTACO TUBE WELDING is the first customer where Lincoln Smitweld has installed and commissioned Lincoln Electric's new Waveform Control Technology for Submerged Arc Welding, integrated with a 3 x 4 meter Column & Boom.*

Through our distributor Wagenvoerde Lastechniek a demonstration was arranged at our WeldTech Centre in Nijmegen. Welding with the Powerwave AC/DC 1000 offers numerous possibilities to enhance productivity in terms of higher deposition rates and consistency in weld quality. It also contributes to substantial savings in power consumption as opposed to conventional SAW equipment. In short, a real breakthrough in submerged arc welding development since many years. The equipment can also easily be linked to remote operation and control facilities such as Ethernet, Devicenet etc. by using the Lincoln Electric NEXT WELD software.



3 x 4 meter Column & Boom

HERSTACO in Middelburg, the parent company, had been awarded a contract for the fabrication of 350 huge piles as part of a waterway project in the Humber River, in the United Kingdom. The steel piles with a diameter of 1m and a wall thickness of 28mm had to be supplied on site in lengths of 55m. Sister company Herstaco Tube Welding was appointed as production site for this project. Due to the short delivery time that had been required HTW was forced to look for alternative production methods that would give a higher production output. The majority of the production hours required would be taken up by welding the vast number of circumferential welds that had to be carried out. Every part of a percent of increased production would allow for a better final result and ease up meeting the delivery time as required by the customer.

Mr. J. Jobse, the 55 year of age production manager, started with HTW about 22 years ago as crane operator. As such he loaded and off loaded many pipes for transport to and from outside welding companies for double and triple jointing and wondered why HTW did not do any welding themselves? With that in mind he came up with a plan and presented this to the management. In 1995 he welded the first joints himself. From that moment on Jobse moved up in the ranks and learned eagerly about production welding. He implemented many new technologies and quality improvements.

At first the circumferential welds were welded with the Gas Metal Arc Welding process (MIG/MAG) but it soon became obvious that the Flux Cored Arc Welding process with Cores Wires offered great improvements in welding efficiency and quality. The workload



increased steadily and the desire for improvements remained. When Lincoln Electric's revolutionary Surface Tension Transfer (STT) welding process first was introduced, HTW was one of the first in starting welding trials to evaluate its use for root runs in pipe in the production process at HTW. After a number of trials it became evident that STT could provide the faster root runs that would speed up the total production process. This was so convincing for the management that resources were made available to invest in new welding equipment. As part of the evaluation, many flawless root runs were made and subsequently followed by Submerged Arc Welding to finish the complete weld. All in all a huge productivity leap for HTW. Due to being awarded more and larger contracts with increasingly higher requirements to quality and delivery times, again new avenues had to be pursued. During Lincoln Smitweld's "Open House" in 2004, all the latest developments in arc welding by Lincoln Electric were on display. Amongst many novelties also the Powerwave AC/DC 1000 for Submerged Arc Welding with its claim to fame, an increased deposition rate (30%) and reduced power consumption against any existing SAW power source.

In the meantime HTW received new and larger contracts at a rapid pace and the decision to invest in a complete integrated SAW welding station including the Powerwave AC/DC 1000 with Column & Boom was eminent. The total system was ordered from Lincoln Smitweld earlier this year. Straight after commissioning the investment proved



to be successful. The promised production increase of 30% was directly established and confirmed. Since then many quality welds have been produced over and over again using Lincoln's flux and welding wire in Speed Feed Drums at a zero defect rate. ■

# COEK rides the Powerwave BIG, BIGGER, BIGGEST

COEK Group from Geel in Belgium has invested to obtain the biggest Column & Boom in Europe and the latest in Submerged Arc Welding technology to be ready for the future. The investment incorporated two of Lincoln Electric's state-of-the-art Submerged Arc Welding equipment, the Powerwave AC/DC 1000, in combination with a 14.5 x 10m Column & Boom and 500t Self-Aligning Rotators (SAR). The latter two being designed and manufactured by Key Plant from Leek/Liverpool in the U.K. The tandem-twin welding head, the complete sensor system and PLC integration has been carried out by Weltron from Burbach in Germany.



## COEK Engineering NV

COEK Engineering NV was founded in 1966 in Geel, Belgium. COEK is specialised in the engineering of every possible process apparatus for the chemical, petrochemical, metallurgical, nuclear, pharmaceutical and food industries. COEK Engineering NV is the head office of the Group COEK, which also incorporates the companies COMOX, TCI, LIMOX and COVALIM for various fabrication and production activities. COEK's product portfolio includes tube heat exchangers, distillation columns, pressure vessels, reactors, process tanks and process apparatus in materials varying from mild steel, creep resistant steel, stainless steel and clad steel to exotic materials as Titanium and Zirconium.



The highly specialised engineers produce designs that meet all relevant standards as for example from ASME, EN, Chinese Regulations for Pressure Vessels, Codas, TEMA, the Australian Pressure Vessel Code etc. COEK Engineering exercises a strict quality control system for the whole group, uses an ASME U and U2 stamp quality system and works in accordance with the specifications of the ISO 9001 standard. COEK Engineering NV is also holder of the Safety Quality Licensing Certificate for

China. The combined production sites can handle all projects and products with in-house machining facilities for cutting, bending, rolling, drilling, milling, turning and welding. In addition, all subsequent treatments as heat treatments, shot blasting, painting, grinding and polishing can be carried out in one of COEK's facilities. All sites are located near the Albert Canal to provide fast and direct connection to the Antwerp Sea Port. The majority of COEK's products are exported over the whole world from Japan to Brazil and from Canada to New Caledonia.

## 14.5 x 10m Column & Boom

The giant C&B has been constructed in over 65,000kg of steel and can handle vessels up to 12.5m in diameter under the boom. It's the biggest in Europe at this moment. The boom is constructed as such that even with a load of up to a 1000kg the movement of the arm is extremely small as required for a stable welding performance without any disturbance or defects. As such the boom can easily handle the weight of the tandem-twin welding head, four 90kg coils of subarc welding wire and two operators without any risk of disturbing the welding process. The heavy duty 2.25x2.25m square column is 14.0m high, mounted on a travel carriage and can rotate 360° to allow versatility in its use. The subsequent platform carries the two power sources, the heated flux recycling system, the control cabinet and the stairs with an elevator for the operators.

## The tandem-twin welding head

The WELTRON designed and manufactured welding head comprises of the various cross-supports with a height sensing system to guide the flat tandem-twin nozzles in a precise and constant movement along the weld-preparation. The control unit integrates all vital elements as position sensor signals, rotator signals and welding parameter values as current, voltage and speed, within the complete installation by means of a Programmable Logic Controller (PLC), in this case a Siemens 5-7 serie 400 PLC. The PLC further entails programmable welding parameters for various predefined weld-bevel preparations. A closed circuit camera-monitor system provides an additional option of remote operation from the platform

downstairs. Obviously the whole installation is equipped with the necessary safety measures to reduce any operator failures and to guarantee operator safety.

## 500t Self-Aligning Rotators (SAR)

The massive SAR's have been fabricated with over 50,000kg of steel, turning the transport already into an incredible event. The rotators, one drive unit and one idler, are equipped with an anti-drift and a sensor system to keep the subject vessel within 12mm of lateral movement during the welding operation.

## Powerwave AC/DC 1000

The Powerwave AC/DC 1000 incorporates Lincoln's latest Waveform Control Technology and enables welding performances as never achieved before. The technology that was first developed for Innovative MIG/MAG welding has now been transferred to Submerged Arc Welding providing many new opportunities to enhance productivity and efficiency in the welding industry. The equipment can easily be linked to remote operation and control facilities such as Ethernet, Devicenet etc. by using Lincoln Electric NEXT WELD software.

The main advantages and benefits Powerwave AC/DC 1000 provides are:

- Increased deposition, up to 10% over conventional technology
- Increased travel speed, digital control gives more stability
- Increased flexibility, easy control of phase relationship for up to 5 arcs to contribute to the same weld, without experiencing arc blow
- Increased machine efficiency, reduction of nominal primary power consumption
- Easy integration, with PLC due to digital communication

## Conclusion

This turnkey project incorporating the 14.5 x 10m Column & Boom, the 500t SAR, the tandem-twin welding head, the Siemens 5-7 PLC together with Lincoln's Waveform Control Technology and the Powerwave AC/DC 1000 provide Group COEK with state-of-the-art technology. The increased deposition rates with lower power consumption while complying with the highest welding standards will give Group COEK the competitive edge performance they need to maintain their success in today's global and competitive industries with strict delivery times, high quality requirements and competitive production costs.



Belgium based company ELLIMETAL has made a huge investment this year to gear up for the future. The investment incorporated two of Lincoln Electric's state-of-the-art Submerged Arc Welding equipment, the Powerwave AC/DC 1000, in combination with a 10.5 x 7m Column & Boom and 400t Self-Aligning Rotators (SAR). The latter two, including the tandem-twin welding head, being designed and manufactured by Key Plant from ueki/Liverpool in the U.K.



# Ellimetal gears up for the future

## Ellimetal N.V.

ELLIMETAL was founded in 1964 in Ellikom, Belgium. Ellimetal is one of the leading companies in engineering and construction of a wide variety of products. The products fabricated range from pressure vessels, reactors, heat exchangers etc. for the Process Industry to silo's & silo systems, storage tanks and special equipment such as chimneys, pylons, filters and -housings. Designed by their own engineering department, Ellimetal's products can be fabricated in mild steel, stainless steel, aluminum,



and steel and even some more exotic materials. All products are subject to a high-level quality assurance system and comply with the latest design codes. The two production plants of Ellimetal are strategically located: one in Meeuwen and one in Genk (see picture), which is alongside the waterway to Antwerp. In combination with it's own logistics department, Ellimetal is capable to realise major and/or specialised high-quality projects. Ellimetal employs about 250 people. It has an annual turnover of over €50 million of which about 85% exported.

## 10.5 x 7m Column & Boom

The enormous C&B has been constructed in over 55,000kg of steel and can handle vessels up to 8.9m in diameter under the boom. It's one of the biggest in Europe at this moment. The boom is constructed as such that even with a load of up to a 1,000kg the movement of the arm is extremely small as required for a stable welding performance without any disturbance or defects. As such the boom can easily handle the weight of the tandem-twin welding head, four 90kg coils of subarc welding wire and two operators without a 1% risk of disturbing the welding process. The heavy duty 1,5x1.5m square column is 10m high, mounted on a travel carriage and can rotate 360° to allow versatility in its use. The subsequent platform carries the two power sources, the heated flux recycling system, the control cabinet and the stairs with an elevator for the operators.



## The tandem-twin welding head

The welding head comprises of the various cross-supports with a height sensing system to guide the flat tandem-twin nozzles in a precise and constant movement along the weld-preparation. The control unit integrates all vital elements as position sensor signals, rotator signals and welding parameter values as current, voltage and speed, within the complete installation by means of a Programmable Logic Controller (PLC), in this case an Allen-Bradley PLC. This present system is equip-

ped with a touch screen for easy operator use. The PLC further entails programmable welding parameters for V-30°, V-40°, V-50° and narrow gap (V-16°) weld-bevel preparations. A closed circuit camera-monitor system provides an additional option of remote operation from the platform downstairs. Obviously the whole installation is equipped with the necessary safety measures to reduce any operator failures and to guarantee operator safety.

## 400t Self-Aligning Rotators (SAR)

The massive SAR's have been fabricated with over 45,000kg of steel, turning the transport already into an incredible adventure. The rotators, one drive unit and one idler, are equipped with an anti-drift and a sensor system to keep the subject vessel within 12mm of lateral movement during the welding operation.

## Powerwave AC/DC 1000

The Powerwave AC/DC 1000 incorporates Lincoln's latest Waveform Control Technology and enables welding performances as never achieved before. The technology that was first developed for innovative MIG/MAG welding has now been transferred to Submerged Arc Welding providing many new opportunities to enhance productivity and efficiency in the welding industry. The equipment can easily be linked to remote operation and control facilities such as Ethernet, Devicenet etc. by using Lincoln Electric

NEXT WELD software. The main advantages and benefits Powerwave AC/DC 1000 provides are:

- Increased deposition, up to 30% over conventional technology
- Increased travel speed, digital control gives more stability
- Increased flexibility, easy control of phase relationship for up to 5 arcs to contribute to the same weld, without experiencing arc blow
- Increased machine efficiency, reduction of nominal primary power consumption
- Easy integration, with PLC due to digital communication

## Conclusion

This turnkey project incorporating the 10.5x7m Column & Boom, the 400t SAR, the tandem-twin welding head, the Allen-Bradley PLC together with Lincoln's Waveform Control Technology and the Powerwave AC/DC 1000 provide Ellimetal with state-of-the-art equipment. The increased deposition rates with lower power consumption while complying with the highest welding standards will give Ellimetal the competitive edge performance they need to succeed in today's global industry with strict delivery times, quality requirements and competitive production costs.



Big trouble?

Every welding problem has a simple solution.

