

# 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.