

FASSI - ITALY

# A BENDING CHAMPION

55 years have passed since the first hydraulic crane with the name Fassi was produced in Italy. Today, Fassi Gru is one of the top hydraulic crane manufacturers in the world. Carpenteria C.S., part of the Fassi Group, bends the complex hexagonal-shaped components for mobile crane arms using an LVD Synchro-Form press brake.

## Made-in-Italy excellence

“In the 80s,” explains Alberto Calzolari, CEO of Carpenteria C.S., “the company began to specialise in processing high-strength steels to construct mobile crane arms. Fassi was among the customers to whom the majority of the company shares were sold in 1989.”

The acquisition led to important structural and organisational growth. At the time, the company’s staff was made up of about fifteen people, operating in a 2,400 m<sup>2</sup> factory. In the short term, the production area was almost doubled, extending to 4,000 m<sup>2</sup> and today it is no less than 15,000 m<sup>2</sup>.

Carpenteria C.S. provides its parent company with ready-to-be-assembled kits, complete with all electrical, electronic and hydraulic parts. Says Calzolari: “Except for the column and the main arm, we make the majority of components, from the base to all the front and rear stabiliser supports. About 90% of the fabricating required by Fassi Gru is processed in our factories.”

Manufacturing the crane’s movable arms starts with bending high-strength steel material in tensile and yield strengths from 700 to 1,300 N/mm<sup>2</sup>, depending on the specifications to be met. These high performance materials are difficult to bend and

more so when meeting increasingly challenging requirements.

## Positioning the workpiece

Last year, Carpenteria C.S. made a revolutionary change to its bending operations with a *Synchro-Form* press brake.

“Before, bending the profiles of the crane’s arms was much more demanding. The handling, positioning and forming of large workpieces with multiple bends required long production times, intense work and often involved bending by trial-and-error until the desired result was achieved,” explains Calzolari. “This process made qualified operators indispensable, and required the use

of gauges, traced bending lines, with manual manipulation of the workpiece carried out with a bridge crane and lifting accessories.”

With the full support of Giovanni Fassi, chairman of its parent company, Calzolari searched the market for bending technology able to handle a large high-strength steel profile typical of a crane arm.

“The feasibility analysis for this automation system began in 2010,” Calzolari recalls. “An idea and a project that in the following years made more and more progress, but with one weak link to solve: the critical issue of the workpiece positioning.”

The system required bending precision and repeatability without compromise to produce highly accurate parts needed for robotic welding. “When I saw LVD’s *Synchro-Form* press brake at work, I realised I had found the technology capable of providing the expected precision for positioning the workpiece, thanks to the front and rear magnetic positioners, and help of dies with a

stone radius. This synergy allowed us to produce the part with 50% better accuracy,” says Calzolari.

#### In-process control

The *Synchro-Form* press brake 1000/61 - 1,000 ton pressing force and over 6,000 mm of bending length - installed at Carpenteria C.S. is equipped with technological solutions that allow the process to be carried out in total automation.

Explains Calzolari: “It starts with a lasercut blank taken from the warehouse and robotically transported to a workstation for mechanical processing. A second robot then delivers the blank to the *Synchro-Form* press brake which then bends it at an average cycle of five minutes per workpiece, depending on the size and thickness of the material. Once bending is completed, the blank is automatically extracted from the press brake and by a robot moved to a 3D scanning system for a quality control. If the part meets the accuracy requirements, it is moved to the robotic welding station for final processing.”



“*Synchro-Form* is a revolutionary adaptive bending system, ideal for making large parts with multiple bends, such as the hexagonal profiles for cranes made by Carpenteria C.S.,” says Andrew Battistini, Sales Director of LVD Italia.

“The *Synchro-Form* multi-axis modules position the workpiece and measure the angles. The digital information is relayed to the Touch-B control, which makes adjustments to part and ram position to achieve the correct profile. Variations are not accumulated but are compensated for in subsequent bend steps. *Synchro-Form* adapts the workpiece in real-time and automatically handles it, with the great advantage that there is no need to rotate it.”

Thanks to the use of the exclusive *Synchro-Form* technology, Carpenteria C.S. has managed to optimise the process, improving efficiency, raising quality, reliability and operational flexibility.

Lamiera, Gianandrea Mazzola

Project development team: Alberto Calzolari from Carpenteria C.S. (last on the right), Marco Verbini, Graziano Bianchi, Simone Ghidetti and Salvatore Pascarella.

