



KUIPERS - GERMANY

# AUTOMATION TO THE LIMIT

**By fully automating its bending operation, KUIPERS CNC-Blechtechnik is able to reap maximum benefits. Result: The automated production of formed parts that can't be manufactured using standard bending cells.**

"Customers who want to manufacture very specific parts in an automated production process are in good hands with us," says Michael Kuipers, Managing Director of KUIPERS CNC-Blechtechnik GmbH & Co. KG in Meppen, presenting the highly productive and automated bending cell developed by LVD/Starmatik.

The system not only manufactures parts using two robots, but also self-loads and efficiently processes several orders without manual intervention. In contrast to standardised automation solutions, the installation offers its users flexibility in programming, and thus also enables the automated production of parts that cannot be manufactured on standard systems.

"In order to do this, one must operate the system to the maximum," says Michael Kuipers, "and that's where the wheat is separated from the chaff."

#### **In the prime segment**

Numbers alone make it clear that, figuratively speaking, KUIPERS belongs to the category of "wheat" in the sheet metalworking business: The 300 employees, 20,000 m<sup>2</sup> of production area and 40,000 ton of material processed per year speak for themselves. Fourteen laser cutting systems, one punch/laser combo and one CNC punch press are used in the 2D-cutting area alone. Add to that 19 press brakes, four roll-bending machines, as well as folding technology. In addition, the extensive production facility includes deburring

and straightening technology, hydraulic forming presses, milling and turning centers, as well as assembly and welding technology.

The spectrum of services ranges from 2D-cutting, to bent parts to mounted or welded assemblies. "We serve the complete process chain of sheet metal. The only thing that we still have to buy is the paint," explains Kuipers. For organisational purposes, KUIPERS has implemented many projects which now fall under the term Industry 4.0. They include an ERP system for one of the largest automated high-bay warehouses with a capacity of 4,560 tons, as well as pocket PCs, which automatically inform the forklift driver which material must be prepared for each



machine, when the operator registers the respective order at the machine.

Michael Kuipers has been managing the nearly 100-year-old company since 2017. The 37-year-old Managing Director is familiar with every aspect of the sheet metal technology. As a child he learned the basic skills of sheet metalworking from his grandfather. As the fourth generation, he will guide the company through the era of digitally networked production.

Not least because of tool compatibility, the bending technology of KUIPERS has relied until now on the machines of a single manufacturer. However, when it came to replacing two older bending cells, Michael Kuipers had the opportunity to see an LVD system in action and found it fascinating.

From the very moment of the resulting order, “LVD has made it very clear that they were willing to go a different way with us, in terms

of automation.” Other providers were not willing to go beyond the scope of the standard solutions of their modular systems. “LVD has shown great flexibility for discussions on interfaces and adjustments.”

This resulted in a bending cell, with an LVD press brake of 135 ton pressing force at the core. At Starmatik in Italy it was equipped with the corresponding automation technology, and also tested with customer parts. This bending cell consists of a tooling stadium and a robot placed in front of the press brake.

The first installation functioned so well that KUIPERS quickly decided to order a second one. “We designed the second system, from the ground up, for high productivity of smaller parts.” Therefore, the bending cell was equipped with a fast hydraulic LVD press brake, as well as with two movable Fanuc robots. The first robot feeds the parts from the material supply, and pre-centers the blanks.

The second robot handles the parts during the bending process on the press brake and stores and stacks the manufactured parts.

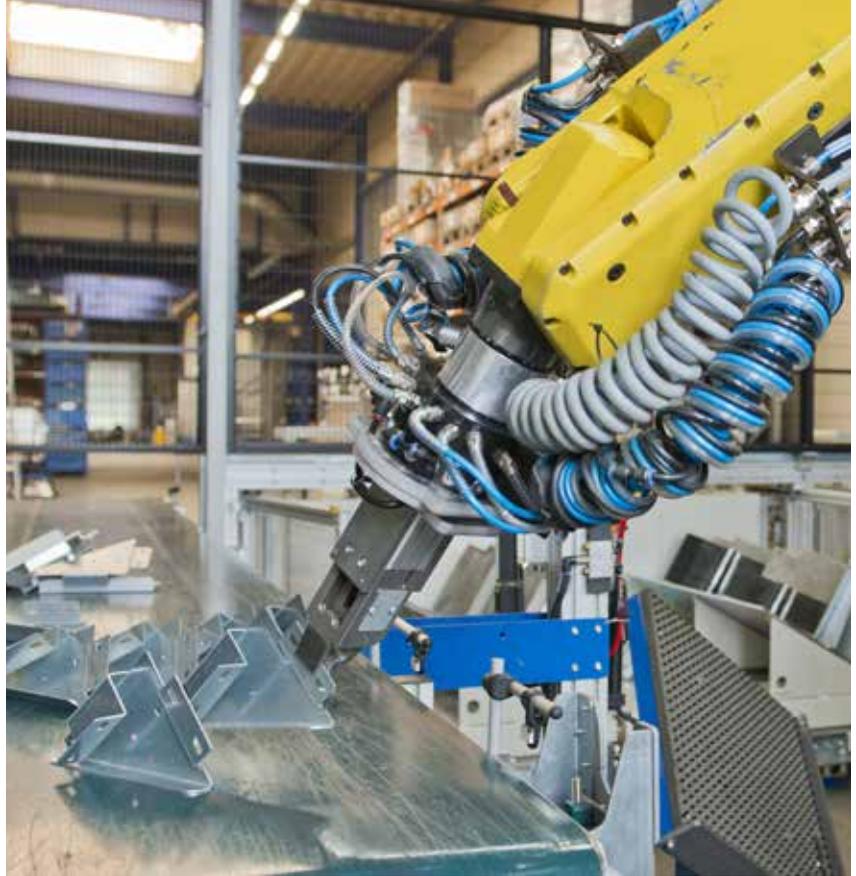
The bending cell automatically sets up the press brake tools and the robot grippers. For this purpose, more than 80 m of tools are provided within the bending cell. Four stations with flexible configuration are provided for the material supply. Upon discharge, the parts can be placed on a conveyor belt or stacked on pallets. The system has a robust zero-point centering over an inclined plane. In addition, there is a gripper station that can be moved in front of the beam, as conceived by KUIPERS, meaning that, so far, it has not been implemented on any other system.

The press brake includes LVD’s *Easy-Form® Laser* adaptive bending system, which performs angle measurement and correction in real time thus ensuring high-quality bent parts.



Michael Kuipers

*“LVD has made it very clear that they were willing to go a different way with us, in terms of automation.”*



#### **Flexibility in programming**

“We can program the systems freely and influence the movements within the area. Additionally, the system was adapted to the limited space. These are options that a modular system doesn't offer. The robot cells are tailored precisely to meet our requirements,” says Karsten Hanenkamp, Operations Manager at KUIPERS.

The system is programmed externally by the Starmatik software, which synchronises with the LVD control unit and software. The programmer sees the complete cell with all the components and parts, as he/she would see it on the machine, and programs entirely in the 3D-area. Algorithms that

automatically generate the bending and movement sequences are stored in the Starmatik software, as nowadays is the case with many providers. “These algorithms work quite well,” says Kuipers. “However, LVD and Starmatik have enabled us the flexibility to intervene in these movement sequences individually.

“Our employees have acquired the appropriate know-how that is relevant not only to the bending process, but also to the gripper technology, as well as the feed and discharge of components.” The gripper technology does not have simple suction arms, but special gripper systems, which are adapted to certain components. Thus, for example, parts with extremely short legs can be reliably gripped and held. KUIPERS designs, configures and builds these gripper solutions itself,

both with vacuum and magnet technology.

Hanenkamp illustrates the advantages based on numbers. “At that time, we requested a portfolio of 20 parts from various providers. With the standardised modular systems, no more than 50 percent of the components could be manufactured in an automated manner. LVD/Starmatik has provided us with the right solutions, so that we can now manufacture 15 parts out of the total of 20 parts, automatically.”

Today, complex interlaced parts with a high number of bends are run through the bending cell, in the case of which each bend must be processed very precisely. Due to a quick feed and discharge of the parts, the second robot can also manufacture parts with a few bends



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in cycle times that can keep pace with the ones in manual operation. This is also due to the precision of the press brake, which delivers precise results using the real-time *Easy-Form® Laser* adaptive bending system. The LVD press brake is already very accurate even without this adaptive bending system. This is due in particular to the tailormade crowning system of the machine.

### **Universal system**

This is a universal system, “which has reserve capacity to realise complex part requirements,” says Kuipers. The system features automatic tool and gripper change throughout and the software also leaves room for adaptations. “We are very pleased with the installation and we are excited about the next one,” Kuipers concludes.

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## Profile

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**Company** KUIPERS

CNC-Blechtechnik

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**Website** [www.kuipers-metall.com](http://www.kuipers-metall.com)

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**Since** 1920

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**Works with:**

mild steel, stainless steel,  
aluminium, plastics, ...

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**Industry:**

Subcontractor in sheet metal and plastic processing to a wide range of industries

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**Equipped with:**

*Easy-Form 135/30* equipped with  
1 Starmatik/Fanuc robot  
*Easy-Form 220/30* equipped with  
2 Starmatik/Fanuc robots

