



Title: Robot-assisted sawing for greater productivity  
Subject: Automation and integration of robots in sawing technology  
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## Robot-assisted sawing for greater productivity

**Automation and robotics are rapidly gaining ground in metalworking – and sawing technology is no exception. Robot-assisted systems are taking over more and more work steps following the sawing process, starting with removal of the cut parts and continuing through deburring, weighing, centring and marking, all the way to sorting and stacking on pallets or in containers. Robots make production more flexible and efficient, improve working conditions and significantly reduce operating costs.**

In recent years, the demands have increased on metal processing in every industry, including the steel trade, automotive manufacturing and machine engineering. Customers want greater manufacturing flexibility, from batch sizes of one item to large-volume production. The variety of materials and sizes is steadily increasing. At the same time quality standards are rising, and there is continuous pressure to cut costs. To hold their own against international competitors, companies need versatile and efficient solutions for a wide variety of production tasks.

### Countless uses for robots

Sawing technology plays a key role in metal processing and offers many opportunities for optimisation. More and more operators of sawing systems are intelligently linking their work processes and automating them with robot support. The benefits are obvious: Industrial robots are fast, reliable and precise, and if necessary they can work 24 hours a day without human intervention. They don't get tired or fall ill, and they can handle a wide range of tasks when equipped with the necessary tools. "Our robots help us with a number of handling and conveying tasks and efficiently perform many machining steps," says Volker Bühler, group manager for robotics at the sawing and storage technology specialist KASTO.

Automation starts right with material feeding. The material to be cut is conveyed to the machine by means of suitable equipment, for example roller conveyors or magazines, thus sparing workers the effort of lifting and carrying, and reducing the risk of injuries. Depending on how it is equipped, the sawing machine itself can also run attended. Material is fed to it automatically, and an intelligent machine control system sets all parameters, such as cutting length and cutting speed, based on the job data. State-of-the-art production saws can thus carry out a variety of jobs in sequence, with different materials and diameters, and operate autonomously for long periods.

### Removal, machining, stacking – automatic from start to finish

Industrial robots also have considerable potential when it comes to handling and processing finished cut parts. For example, they can remove them from the machine, thus relieving workers of this repetitive task. When equipped with appropriate tools, robots can also perform tasks like deburring, chamfering, marking, centring or measuring workpieces. Cut parts can be weighed, sorted by size or job, and stacked on pallets or placed in containers. The parts can also be

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transferred directly to a driverless transport system. "For complex processes involving various work steps, we also use combinations of different robots and clamping devices," explains KASTO expert Volker Bühler.

When large quantities of material are sawed with only a few different component geometries, it is relatively easy to automate the downstream processes. The situation is different with custom sawing involving diverse materials and dimensions. "The greater the variety, the harder it is to cover all the possibilities," says Volker Bühler. The choice of robot tools is an important factor. A robot must be able to deal with all the objects it encounters while using as few aids as possible. This reduces procurement costs, minimises idle times and increases productivity. Users have a choice of mechanical, magnetic or vacuum-operated grippers. The grippers should be as compact as possible to give the robot easy access to the cut parts.

### **Sawing technology on course to Industry 4.0**

With the help of the right components, sawing can be combined with other automated operations to create complex, highly integrated systems that are seamlessly connected in a continuous material flow. This includes upstream storage as well as downstream handling and processing. For example, KASTO implements combined storage and sawing systems for its customers in which all storage, handling, sawing, marking, palletising and bundling processes are completely automated – from storage of the raw material to retrieval of the cut parts. The control software can be linked to existing ERP systems like SAP for greater transparency and efficiency. Sawing can be integrated with other processes like turning or milling in digitised, self-configured production systems such as envisioned in Germany's Industry 4.0 initiative.

Automated sawing technology offers significant advantages to users. Many processes can run unattended and much faster, which increases productivity and reduces the need for personnel. It is easier to make up the difference when employees are ill, and robots can keep working even during breaks or after shifts. The result is lower personnel costs and greater flexibility in terms of capacity utilisation. Companies can react more easily to order peaks and dramatically reduce idle times. This can make a big difference economically: "We've calculated that, depending on the shift model, an investment in an industrial robot with a machine like our KASTOvariospeed saw pays for itself in less than a year," says Volker Bühler. "When you consider that systems like this are used for more than ten years on average, users can reduce their operating costs for a very long time."

### **Benefits for both users and customers**

Robot technology also helps to improve working conditions. It relieves employees of heavy, tiring and monotonous tasks. The risk of accidents and injuries is reduced. Moreover, the cut parts are of better quality, because robots machine them with equal precision, sort them reliably and stack them neatly. This provides benefits not only for operators of automatic sawing facilities, but also for their customers.

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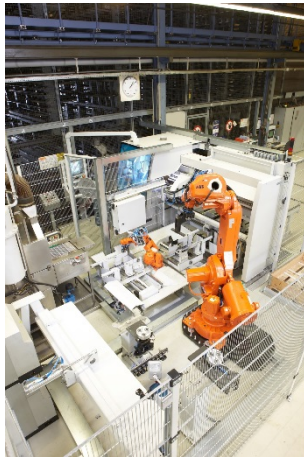
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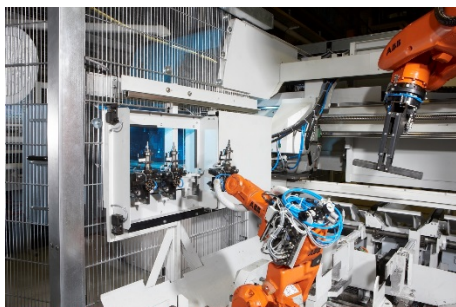
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**Picture Captions:**



**Photo 1:** Automation and robotics are rapidly gaining ground in metalworking – and sawing technology is no exception.



**Photo 2:** Robot-assisted systems are taking over more and more work steps following the sawing process, starting with removal of the cut parts and continuing through deburring, weighing, centring and marking, all the way to sorting and stacking.

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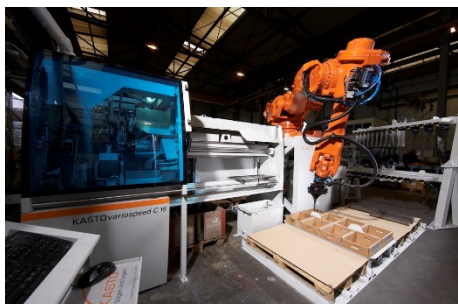
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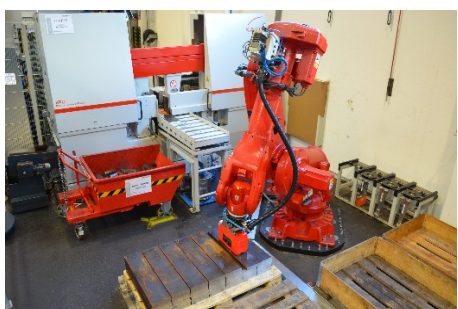
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**Photo 3:** Robot technology relieves employees of heavy, tiring and monotonous tasks, and it reduces the risk of accidents and injuries.



**Photo 4:** The cut parts are of better quality, because robots machine them with equal precision, sort them reliably and stack them neatly.

Picture credits: KASTO Maschinenbau GmbH & Co. KG

### **About KASTO:**

KASTO Maschinenbau GmbH & Co. KG, based in Achern, Germany, specialises in sawing and storage technology for bar stock. The company is a global leader in the manufacture and sale of metal-cutting saws and semi-automatic and automatic storage systems for bar stock and sheet metal. It is also a leading manufacturer of automatic handling systems for metal bars, sheet metal and pre-cut parts, as well as the corresponding software. One of Europe's oldest family-owned companies, KASTO celebrated its 170th anniversary in 2014. In the course of its successful history it has registered 160 patents, delivered more than 140,000 sawing machines to all parts of the world and installed more than 1,800 automatic storage facilities. In addition to a branch in Schalkau, Thuringia, KASTO has subsidiaries in England, France, Switzerland, Singapore and the USA.

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