Success Story

Robot system offers highest precision

Automated grinding for excellent quality at Kohl & Sohn

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HAIGER/COLOGNE – As specialist for the production of larger formed parts and complex welded assemblies made of steel, stainless steel and aluminium Kohl & Sohn GmbH places the highest priority on product quality. For the production of battery covers of forklifts, the company relies on automation solutions by CLOOS. After the components have been welded with CLOOS robots, another robot takes over the automated rough and fine grinding. This process sequence ensures permanently high-quality results with consistently high quality.

Whether metal forming, welding, cutting, tool construction, measurements, surfaces or coating – with a wide range of manufacturing processes, Kohl & Sohn produces sophisticated components made of steel, stainless steel and aluminium. The company delivers complex welded assemblies or ready-to-install parts just in sequence directly to the assembly line. Whether components for agricultural machinery, battery doors and bonnets for forklift trucks, chassis for electric pallet trucks or elements for automated logistics systems – many customers appreciate the high manufacturing quality of the traditional company. Founded in 1897, Kohl & Sohn is the oldest company within Kohl Gruppe AG. Today, the group of companies employs a total of around 450 people at its three locations in Cologne and Slubice in Poland.

Continuous investment in production

"In addition to the high technical demands on the quality of the products, our customers expect maximum flexibility from us as a supplier," explains Managing Director Hubertus Müller. "As we specialise in the production of small and medium quantities, we have to continuously adapt and expand our machine park in order to be able to react to changing customer requirements in good time.

In 2018, Kohl & Sohn invested in a new robot system for automated grinding of welded components. At the Cologne site, the company uses nine robot systems for automated welding in addition to the grinding system. There are also around 15 welding power sources for manual welding. The company uses another welding robot system at its Polish production site in Slubice.

Photo 1: First, CLOOS robots weld the components.

Joint project with CLOOS & FerRobotics

Kohl & Sohn planned and implemented the automatic grinding system together with CLOOS and FerRobotics. While CLOOS contributed its robot and system engineering know-how to the joint project, FerRobotics contributed its technological expertise in sensitive robotics with patented force/contact intelligence and Kohl & Sohn the specialist knowledge in grinding applications. "Our grinding system was the first joint project by CLOOS and FerRobotics. We solved all challenges in partnership," says Müller happily. "The cooperation with our two partners worked excellently."

Photo 2: This is followed by the automatic grinding process.

2-station robot system

The robot system consists of two stations. Both stations have two vertical faceplates. The workpiece can be turned into the optimum processing position by a horizontal turning axis. The station change is made by a horizontal rotation. Due to the two-station design, robot grinding in one station and loading of the components in the other station is simultaneously possible.

Photo 3: The tool changing system enables the use of various grinding applications.

Different grinding techniques in one system

The robot is fitted with a tool changing system. This allows a maximum production flexibility as different grinding applications can be used depending on the application. Kohl & Sohn uses the Active Orbital Kit (AOK) and Active Angular Kit (AAK) by FerRobotics. The AOK is a system package optimised for robot use with an industrial-grade orbit sander for texture-free surface finishing of all materials. The AAK includes an enormously durable robot-compatible angle grinder for the automation of grinding

processes. The compact and lightweight sanding grinding applications offer highest process quality.

Photo 4: The robot also takes care of the fine grinding.

Intelligent additional functions

In addition, an abrasive media changing station is integrated into the system. Here, the abrasive media are exchanged quickly, easily and automatically. The change of the abrasive media is controlled by a sensor. A sensor monitors the filling level of the magazines.

In addition, the CLOOS Grind Control Interface GCI 1.0 offers an optimal human-machine interface to the CLOOS robot system. All process parameters, from the rotation speed to the contact pressure to the feed, can be controlled individually at the same time. The CLOOS Grind Control Interface GCI 1.0 allows simple and intuitive control and extensive diagnostics possibilities with set and actual values.

Efficient production processes and best quality

In the past, the components were processed manually. There can be fluctuations in the amount of effort needed to achieve the required quality, as the grinding result strongly depends on the sensitivity of the respective employee. This dependency is eliminated when using the robot. Thanks to the precise technology, it offers consistently high quality with reproducible results. At the same time, the production capacity is now less dependent on the availability of individual employees.

Overall, Kohl & Sohn was able to significantly accelerate the production processes by switching to automated grinding technology and the reduced non-productive times. Another positive effect of the robot use is the reduced consumption of grinding wheels. Due to the constant pressure conditions during automated grinding, significantly fewer grinding wheels are needed than during manual grinding.

Robot use improves working conditions

Last but not least, the employees also benefit from the use of the new technology and the improved working environment. The robot system offers employees a demanding and exciting workplace. As the robot carries out the physically heavy work, they can concentrate on process monitoring. The general hazard from sparks, emissions and heat is significantly lower than with manual grinding. In order to benefit fully from the innovative technology, the staff was intensively trained by CLOOS. In the meantime, five employees have been trained to work on the robot system. This means that the robot system can continuously produce in 3-shift operation.

Photo 5: The components convince with a consistently high quality.

Video on CLOOS TV

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