CASE STUDY

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Reaching your target at high speed

KS turns to automation in the milling of aluminum workpieces. Working with the extremely fast and compact KUKA KR AGILUS.

KS Metallbearbeitung GmbH, in the Swabian town of Spaichingen, has taken a bold step towards automation: a decision well worth taking. That's because using automated solutions in the form of industrial robots and machine tools has a clear competitive advantage.

KS Metallbearbeitung GmbH specializes in the machining of aluminum. Their technical expertise is predominantly in the machining of aluminum profiles – from sawing and CNC machining to vibratory finishing. KS was founded in 1983 by Kurt Schuhmacher. He is still the managing director of this company, which has its headquarters in Spaichingen, in the rural district of Tuttlingen. The company supplies businesses from diverse sectors, such as window and facade technology, mechanical engineering and the electronics industry, each of which has its own special requirements.

A complete and convincing solution consisting of machine and automated robot cell

KS was on the lookout for a new, high-speed machining center. At EMO 2011 in Hanover they came into contact with Dreher AG, trade partner of the American machine tool manufacturer Haas Automation Inc. and system partner of KUKA Roboter GmbH from Augsburg. Once reservations regarding the operation of the robot cell had been dispelled, and the use of a variety of different parts was guaranteed, Dreher AG devised a complete machine and automated robot cell solution. After visiting the 2012 in-house trade fair on Dreher's premises, the decision was made in favor of an automated solution with a Haas VF-2SS.

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High flexibility with low set-up times

"The automated solution from the DR-1B robot cell and Haas VF-2SS fulfills our requirements completely. Fully-automated manufacture means we can produce higher quantities, 24 hours a day, 7 days a week. In addition, the connected VF-2SS milling machine accomplishes the required drilling and milling work at high speed. At the same time, we remain flexible due to the low set-up times and can therefore manufacture a variety of parts," says Bernd Haller, head of production for CNC machining. SS stands for Super Speed – high-speed milling. The VF-2SS has a spindle with a direct drive which generates 12,000 rpm. With resonance filtering, path smoothing that can be set by the operator and an extended program memory, the VF-2SS can machine a wide variety of parts due to the short set-up times.

High speeds aren't only important in the milling cell but also in the loading and unloading of the machine tool. Therefore, for the robot cell the decision was made in favor of the new KUKA KR AGILUS 6-axis jointed-arm robot. A conveyor belt transports the workpieces into the robot cell. After that, the KUKA KR AGILUS collects the workpieces from the selected position and temporarily stores them on a special fixture in the cell. The configuration has been programmed and saved on the separate user interface in advance. The robot grips the workpieces, which are now aligned to the zero point, and loads them into the VF-2SS. The machine carries out the drilling and milling work. The robot removes the workpieces after machining and feeds them through a chute into a receptacle installed outside of the cell.

The KUKA KR AGILUS: a master of speed

The KUKA KR AGILUS is characterized by short cycle times and a high degree of precision and reliability. When it comes to handling tasks, especially Pick&Place, the small robot delivers impressive results combined with minimized cycle times. At the same time, the KR AGILUS family works with great precision, enabling manufacturing quality of the highest standard. Its speed and accuracy make the performance of the

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KR AGILUS unique in its payload category. The product portfolio includes robots with a payload of 6 and 10 kg and reaches of 700, 900 and 1100 mm. A KR AGILUS is used in the solution applied at KS.

The basic equipment of the DR-1 cell includes an industrial robot with gripper system and a clamping fixture. Dreher supervised all components in this project: the robot interface to the zero point clamping system, programming of the KUKA robot and the Haas machine.

"At first glance, an automated system appears to be an expensive matter. The combination of Dreher robot cell and Haas machine tool is a high-performance and therefore cost-effective solution with low amortization times. All those who calculate correctly know that automated solutions mean an initially high-cost investment, but the hourly rates of automated machining are only a third of those for manual operation. This means that automated solutions are internationally competitive and the production will stay here in Germany and not be relocated to Eastern Europe," explained Martin Dreher, director of Dreher AG.

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