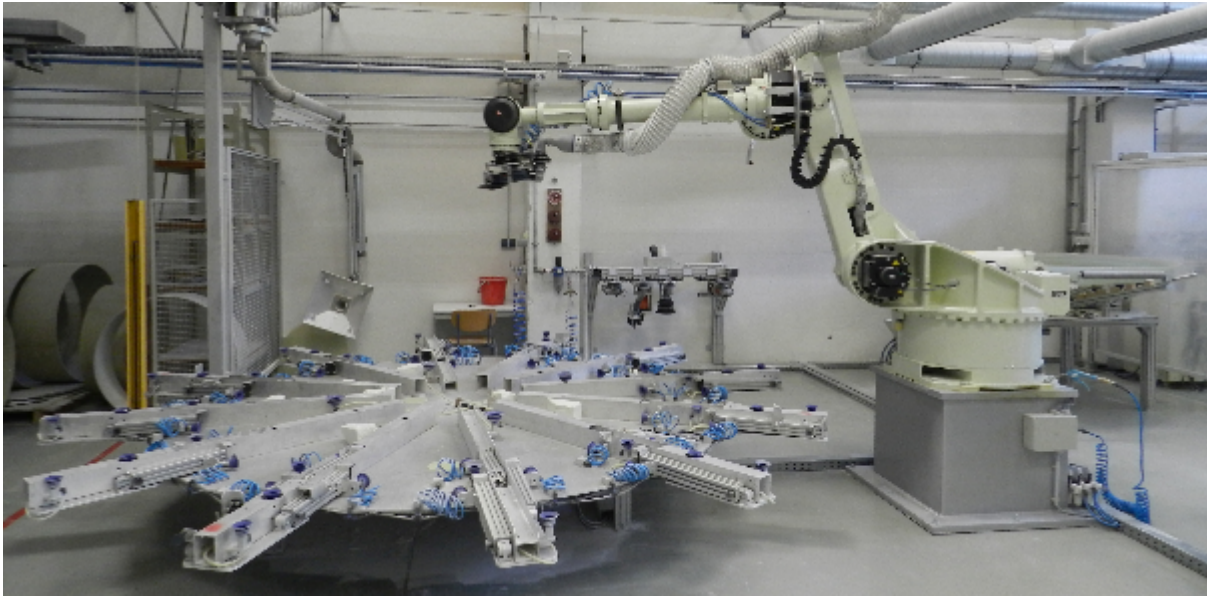


Case Study Haase Tank GmbH (August 2018)



The Kawasaki ZT130L robot has been combined with an automatic tool change system and specially developed rotary tables. It can flexibly and effectively process the lids and bottoms of the approximately 100 Haase tank variants. This has allowed Haase to double their output since 2011.

Traditional Manual Work Meets Modern Automation Technology: Haase Tank Expands its Production with Kawasaki Robots

With its double-walled underground tanks, the Haase Group has been a market leader in the tank industry for more than 50 years and relies on a unique combination of traditional manual work and modern automation technology. Since the integration of the first Kawasaki robot in 2010, the traditional Saxon manufacturer has not only been able to significantly optimize its production and efficiency, but also to support its sustained growth in many industries and international markets.

The company in Großröhrsdorf in Saxony produces double-walled cellar and underground tanks made of glass fibre reinforced plastic (GRP) using the latest production technology. In 1999 Haase GFK-Technik GmbH (since 2017: Haase Tank GmbH) was founded as an independent company - since then the number of employees has increased from seven at the beginning to almost 50 today. Haase has been recording strong growth for years, says Managing Director Thomas Falkenbach: "We looked for and found a market niche. This has enabled us to position ourselves successfully as a pioneer in the field of tanks - regarding material, quality and flexibility".



The Kawasaki ZT130L working the edge of a tank bottom.

regarding material, quality and flexibility".

In Germany, Haase has been offering its customers a special guarantee for years: within 48 hours of ordering a tank, one of the many standard sizes can be delivered directly to the construction site. In addition, customers always receive a 30-year guarantee on the sealing of their heating oil tank. The glass-fibre-reinforced plastic has proven its worth for Haase and its customers: The material is corrosion-free, stable, resistant to ageing and absolutely odour-proof.

Haase began using robots in production early on: 1991 saw the first automation steps and the gradual introduction of robots - a noticeable relief for the company. In recent years, Haase has mainly utilized used robots from two other manufacturers for spray applications and mechanical processing. The decisive disadvantage: These robots dated back to 1989, so that maintenance and servicing of the machines became increasingly difficult and it was no longer possible to guarantee reliable procurement of spare parts in the long term.

Robust Design and Reliable Service are Crucial for Haase

Jürgen Krell, technical director at Haase, visited the trade fair Automatica in Munich in 2010 to find new options for Haase's aging robot equipment. There, among other manufacturers, he spoke to Kawasaki Robotics. The decision was made quickly, explains Jürgen Krell: "For us, the attractive price, the robust design and the specific but precisely fitting requirement profile of the robot were the deciding factors. With a proven Kawasaki partner in the neighbouring town, the available service was also excellent for us. And the technical support provided by Kawasaki itself has quickly proven to be particularly reliable and flexible".

The choice fell on a ZT130S for spraying the GRP: The shelf-mounted robot carries up to 130 kg and has been developed for a variety of applications. With a horizontal/vertical reach of 3,230mm/4,571mm, the ZT130S combines a wide working range with high precision. Some time later a Kawasaki BX100L robot was added to the production site, which is also used to apply resin and glass fibres to a mould.

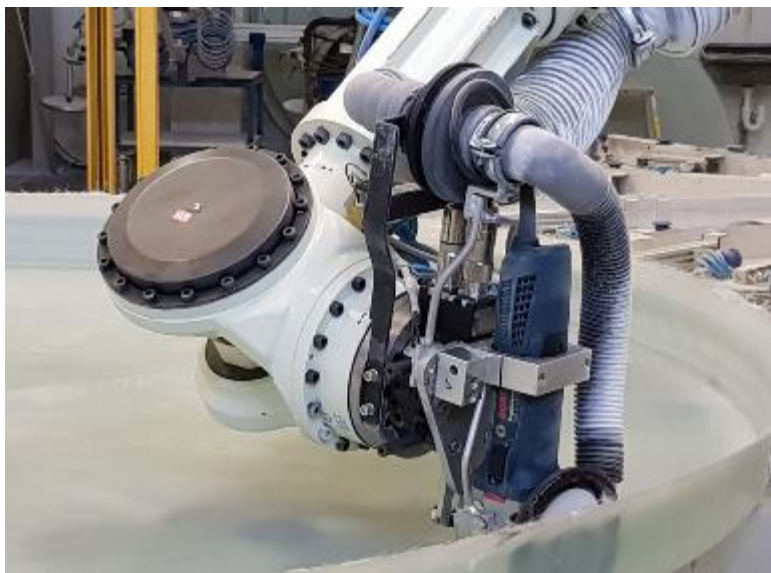


The attractive price, the robust design and the exactly fitting requirement profile of the Kawasaki robot convinced the Haase Tank team.

After the decision for the first Kawasaki robot as the basis for a new automation strategy at Haase was made, planning and implementation proceeded quickly: In winter 2010 the old robot models were removed, the plant was completely restructured and in less than three months the integration of the new robot was completed. Since then, all spraying stations in production have been successfully automated. Together with a mechatronics engineer, Jürgen Krell personally takes care of setting up and programming the Kawasaki robots at Haase. Previously, the company had several different programming languages - between different manufacturers and old and newer models. With the arrival of the first Kawasaki robot, this situation was successfully unified in a very short time.

Output of Production has more than Doubled since 2011

The winter of 2013 saw the addition of another ZT130L for working lids and bottoms with automatic tool change: Before the introduction of the Kawasaki robot, the largest Haase tanks with a diameter of up to 4 meters could only be processed manually. The ZT130L makes production significantly more flexible and faster. "We more than doubled our output compared to 2011. The three Kawasaki robots play an important role in this," says



Jürgen Krell. The Haase product portfolio currently consists of tanks with ten different diameters, including several variants - a total of approx. 100 types. On the one hand, little adjustment is necessary per production, but at the same time small adjustments and slight adjustments of the tanks are part of Haase's daily business. The Kawasaki robot, the turntables and the entire system offer the team the necessary flexibility.

No special tools necessary: The Kawasaki ZT130L at Haase Tank uses standard milling and sawing machines.

Automatic Tool Change

The ZX130L picks up the necessary tools as required: Haase developed and built a special tool change station for this purpose. Particularly practical and cost-saving: The robot is not dependent on special tools, but uses commercially available machines. A milling tool is used to prepare the manhole in the tank, while an angle grinder prepares the surface to be laminated for further processing. Two saws enable precise cutting of the workpiece and grinding of the outside of the tank. A suction attachment allows a thorough and precise final cleaning of the lids and



From angle grinders to saws - the robot picks up the right tool independently.

bases.

The setup offers maximum flexibility and greatly increased efficiency: The robot is able to process both single or multiple lids and bases in series. A central challenge in the construction and operation of the plant was the considerable amount of dirt and dust produced during processing. An suction system specially tailored to these requirements ensures continuous and effective extraction of dirt. Only the robot controller needs to be cleaned weekly to ensure a smooth operation. A cell was considered as an alternative to the current open space solution, but proved impractical and would have significantly reduced output. The new system based on the ZT130L and the suction system ensured that there is around 60 percent less dirt in the air.

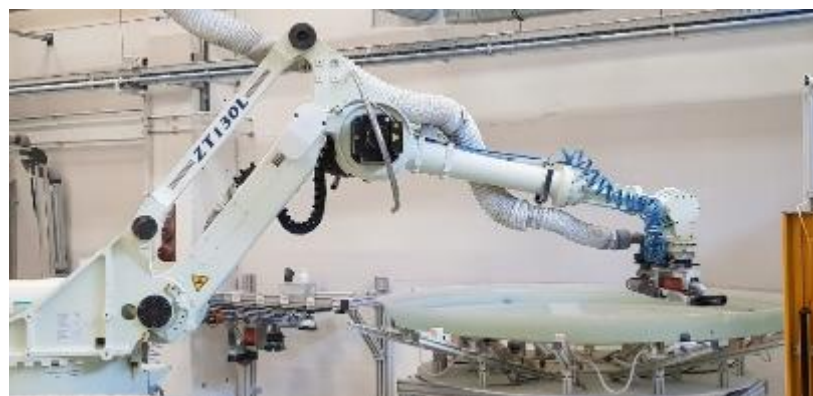


The system based on the Kawasaki robot allows fast and flexible processing of the tank lids and bottoms in series production.

Maximum Safety for Smooth Collaboration between Humans and Robots

A light barrier effectively protects the working area of the robot in combination with the Kawasaki Cubic-S safety system. Cubic-S ensures that robots and workers can work together safely and without hesitation. The software enables the installation of particularly space-saving applications and security areas without complex external security measures. Cubic-S combines eight safety functions - including an individual definition and precise limitation of the available working space. Extremely space-saving application cells can therefore be implemented without any problems. The robot cannot exceed the specified working range limits at any time.

The individual axes of the robot are electronically monitored: predefined axis values form the limits of possible movements. If a predefined speed is exceeded, previously stopped axes are moved or tools leave their intended orientation, Cubic-S automatically switches off the robot.



Safe, clean and fast: An integrated suction device was able to reduce the dirt in the room caused by the GRP by around 60 percent.

"For us, manual work and automation are closely interwoven. Therefore, we are

continuously optimizing Cubic-S and our safety setup in order to make the joint work of man and robot even easier, more effective and safer," says Jürgen Krell.

Prospects

The sphere with the slogan "Ich bin zwei Tanks." ("I am two tanks.") is still an important symbol of the company today: Haase generates more than two thirds of its total turnover from oil tanks. But also the construction industry, cellar tanks, industrial applications and heat storage systems are increasingly important pillars for the company. "In view of the slowly but surely decreasing use of heating oil as an energy source, we are of course also opening up other areas in the long term. With more



than five million oil heaters in Germany alone, however, oil tanks will remain a very relevant market for the foreseeable future," explains Managing Director Thomas Falkenbach. While the oil tanks are only sold to German customers, other products such as heat accumulators as well as oil and grease separators are also in demand on the international market - and are exported to Scandinavia, Italy, Dubai, Southeast Asia and the USA, among others. The Swiss Federal Railways, for example, are currently completely converting their light liquid separators to Haase tanks. "The successful automation and use of robots create the basis for our further growth. This enables us to meet the growing demand in a targeted manner," adds Falkenbach.

"I am two tanks." Haase tanks in the production hall in Großröhrsdorf in Saxony.

Haase currently works with 65 regional partner companies in Germany and relies on close personal contact with them in order to offer the best service possible. Haase relies on a uniform sales and service structure: All partners worldwide are intensively trained and certified. Therefore, a network of trained specialist companies is available to customers for optimum service - both nationwide and in other European countries.

Falkenbach draws a positive conclusion from recent years: "The use of Kawasaki robots has quickly paid off for us and offers us full flexibility in the long term. Our team is always working on further optimizing the close cooperation between robots, tools, extraction system and turntables. At the moment, the optimum of the system has almost been reached - only the speed of the rotary tables is to be increased in the near future". After several extensive investments and newly implemented Kawasaki robots in recent years, there will be a rest period for a while with regard to innovations, explains Jürgen Krell: "But we always keep an eye on new ideas and optimization potentials".