

Case Study: Storage Tank Manufacturer Expands Business Using Kawasaki Robots, Safety System & Tool Changer

Application: Spraying & Material Removal

Robot Model: Kawasaki ZT130S, ZT130L & BX100L Large Payload Robots

OVERVIEW

With their double-walled underground storage tanks, German company 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 their start in 1999, Haase has recorded strong growth 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." But in 2010, they decided to enhance their tank finishing process using Kawasaki robots and safety software.

Since the integration of the first Kawasaki robot in 2010, the traditional 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 Kawasaki ZT130L robot has been combined with an automatic tool change system and specially developed rotary tables.

CHALLENGES

Aging Machinery

Haase was an early adopter of robotics, installing their first robot in 1991. This upgrade brought a noticeable relief for the company, so they continued down the path of automation. As time went on and the robots grew older, maintenance and servicing became increasingly difficult. When it was no longer possible to guarantee reliable procurement of spare parts in the long term, they knew it was time to upgrade.

Dusty Environment

A central challenge in the construction and operation of the plant was the considerable amount of dirt and dust produced during processing. They needed a robot arm suitable for a dusty environment and a controller that didn't require constant cleaning.

SOLUTION

- Installation of Kawasaki shelf-mounted ZT130S robot led to automating more processes
- Automatic tool change station allows robot to swap out four different tools

Haase installed the Kawasaki ZT130S robot to spray glass fiber reinforced plastic (GRP) onto the double-walled cellar and underground storage tanks during the finishing process. The robot is shelf-mounted next to a turntable where the parts are fixed, making it easy to apply an even coat of GRP.

The ZT130S robot provides the payload (130 kg) and a horizontal/vertical reach (3,230 mm/4,571 mm) needed for this application. However, its wide working range and high precision capabilities make it perfect for the spraying process specifically. The robot is able to process both single or multiple lids and bases in series, offering maximum flexibility and greatly increased efficiency.

Due to the success of the ZT130S, Haase added a Kawasaki BX100L robot to the production site, which is also used to apply resin and glass fibers to a mold. They also added another ZT130L for working lids and bottoms with the automatic tool change system. This system provides them the flexibility they need to manufacture approximately 100 different tank types as needed.

Kawasaki First

Jürgen Krell, technical director at Haase, decided to go with Kawasaki Robotics after interacting with them at the Automatica trade show. "For us, the attractive price, the robust design and the specific but precisely fitting [specifications] of the robot were the deciding factors. With a proven Kawasaki partner in the neighboring 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 Kawasaki ZT130L working the edge of a tank bottom.

A Cleaner & Safer Environment

A suction system was made to ensure continuous and effective extraction of dirt during the finishing process, which removed 60% of airborne dirt. The Z series robots run on Kawasaki's E series controller, which only needs to be cleaned once a week for optimal performance.

Automatic Tool Change

Haase also developed and built a special tool change station so the robot can efficiently switch between four different tools needed for finishing. The shelf-mounted ZT130L robot is not dependent on special tools - it uses commercially available machines such as a milling tool to prepare the manhole in the tank and an angle grinder to prepare the tank surface for lamination and further processing. The robot also uses two saws enable precise cutting of the workpiece and grinding of the outside of the tank and a suction attachment for a thorough cleaning of the lids and bases.



Top: No special tools necessary: The Kawasaki ZT130L at Haase Tank uses standard milling and sawing machines. From angle grinders to saws - the robot picks up the correct tool independently.

Bottom: The budget-friendly price, robust design, and specifications of the Kawasaki robot made the decision easy for the Haase team.



"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."

- Thomas Falkenbach, Haase Group Managing Director

Maximum Safety Enhances Human-Robot Collaboration

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 the individual definition and precise limitation of the available working space. The robot cannot exceed the specified working range limits at any time.

For this safety system to work, 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.

RESULTS

"We more than doubled our output compared to 2011. The three Kawasaki robots play an important role in this," says Jürgen Krell. 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.

He 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."

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