Success Story

High-tech made by CLOOS

Henan Junton Vehicle invests in automated welding technology

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SANMENXIA/HAIGER – Chinese companies increase their investments in highly automated welding systems. For some years now, the industrial vehicle specialist Henan Junton Vehicle completely trusts in the welding technologies by Cloos. With the highly automated welding systems, the company can further increase the efficiency of its production and thus expand its competitiveness.

Henan Junton Vehicle Co., Ltd. was founded in 2005 and is continuously rising. Today, the company is said to be the industrial vehicle manufacturer with the biggest production capacity in China. The product portfolio comprises crane-lifting trucks and industrial transport vehicles, among others. In total, Junton manufactures 200 different products. The production and a part of the development department are located at the headquarters in Sanmenxia in Henan, a province of Central China. Here, 1,500 employees produce about 80,000 vehicles per year in a production area measuring more than 1,000,000 sqm. Another research and development centre is situated in Xi´an, in the province of Shaanxi. The company sells the vehicles both all over China and abroad in South-East Asia, Africa, Central Asia and South America.

"We would like to further increase the quality and the productivity of our production by means of continuous investments in automated welding technology," explains Jianfeng Pan, Managing Director and owner of Henan Junton Vehicle Co., Ltd. "We wish to rebuild our production sites to be the most modern ones with regard to digitalisation and connectivity in worldwide comparison." Overall, Henan Junton Vehicle has 39 CLOOS welding robots in operation. Another 26 robot systems are already ordered and will be commissioned soon. Within the next three years, 60 more CLOOS welding robots shall be added.

Photo 1: The complex robot system for welding dumper components consists of four welding stations with a total of 12 welding robots.

Complex robot system with intelligent component allocation

In a modern production hall, components for more than 100 dumpers for trucks are produced in a complex, chained welding system per day. The system consists of four welding stations with 12 QIROX robots type QRC-410-E in total. The six-axis articulated arm robot has an excenter axis 7 which is integrated between robot base and centre point of axis 1.

Photo 2: The six-axis articulated arm robots have an excenter axis 7 which extends the working envelope of the robot and allows an optimum welding torch positioning.

This seventh axis extends the working envelope of the robot and allows an optimum welding torch positioning. Two robots each are working in two stations, four robots each are working in the two other stations. The welding robots are mounted upright on floor-mounted linear tracks. Carriages move the robots in horizontal direction which simplifies the welding of long workpieces.

Photo 3: Automated guided transport vehicles move the fixtures with the workpieces between the individual welding stations.

A central system controls the transportation of the fixtures. As soon as a fixture is ready, an employee loads it with the workpiece. Then the controllers sends an automated guided vehicle to get the fixture with the workpiece. The controller informs the vehicle what kind of workpiece it is and to which welding station it shall be transported. As soon as the positioner has taken the fixture, the corresponding robots get a command by the controller and welding is automatically started. After welding the robots send a signal to the controller so that the automated guided transport vehicle picks up the fixture again. Subsequently, an employee unloads the welded workpiece. The empty fixture is sent back from the end to the start position via a conveyor above the welding line. Then the procedure starts again and the controller sends the vehicle to the next workpiece

Photo 4: In another chained system with intelligent shuttle system, 5 welding robots weld more than 60 different smaller attached parts and accessories for the tippers.

The complete production process with intelligent logistics and welding solution allow a nearly operator-free production. "During factory visits, our customer admire the latest production technology and appreciate the high level of automation behind the products," emphasises Pan. "In total we could considerably increase our market performance regarding product quality and efficiency."

Robot system with intelligent shuttle solution

Another CLOOS robot systems welds smaller attached parts and accessories for the tippers. Five QIROX robots type QRC-350 weld more than 60 different workpiece versions. The focus of the system is on an intelligent shuttle system which automatically distributes the workpieces with the fixtures to the different welding robots. The shuttle in the loading area recognises automatically to which welding station the workpiece is sent. The welding robot also identifies from the jig which welding program to use for the component. The shuttle is equipped with a double gripper that allows a nearly simultaneous loading and unloading of the components.

"The CLOOS system enabled us to significantly improve both the quality of the production processes and the work environment and to increase the repeatability," says Wu Junli, production manager for attached parts and accessories. "The intelligent component recognition facilitates the production enormously."

Chained system with automated storage system

Another highly complex chained system welds crane supports and smaller rotating towers. This system consists of four QIROX QRC-410-E welding robots and a storage system. Three robots weld different types of crane supports while one robot only welds smaller rotating towers. The fixtures are manually loaded. Then the employee scans the bar code at the fixture and it is temporarily stored in the storage system. As soon as the appropriate welding robot is available, a carriage placed on a floor-mounted linear track gets the workpiece and takes it to the welding station. After welding, the carriage picks up the workpiece again and temporarily stores it for cooling down. When the component is cold, it is automatically brought to the unloading station. After unloading, the empty fixture is transported back to the temporary storage.

Photo 5: Another chained system consists of four welding robots and a complex storage system.

The advantages of the intelligent system are obvious. Due to the automated logistics solutions, errors because of a wrong component allocation can be avoided completely. Thus Junton saves much time, space and costs. Furthermore, the cycle times were considerably reduced. The costs for personnel could also be reduced while the operators' working conditions have been improved essentially at the same time.

Automated welding lines meet high requirements

Due to the use of the highly automated welding technology the company can increase it competitiveness considerably. At first, the output rose by using the flexible CLOOS robot systems: Henan Junton Vehicle produces 20 mobile cranes and 100 tippers each per day. Secondly, the productivity increased significantly. Due to the change from manual to automated welding, the welding time has been reduced by almost half. Furthermore, there are no downtimes compared to manual welding. In total, Henan Junton could considerably reduce the production costs and - at the same time - increase the quality.

"CLOOS is a company with a very long tradition and provides top technologies," emphasises Pan. "We intend to further intensify the cooperation with CLOOS in the next years to make our production even more modern and to become the Number 1 world wide in the industrial vehicle and crane-lifting industry."

Photo 6: Crane supports and smaller rotating towers are welded on the system.

Video interview on CLOOS TV

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