



The laser marker labels the tubes, which were filled and sealed in the filling unit. The XTS takes the tubes from the filling unit to the discharge chutes at high speed, while passing the position detection, laser labeling and visual inspection units.

High-precision laser marking of aluminum tubes

XTS doubles throughput and enhances quality

Specialist for industrial automation Egaratelek S.L. develops and manufactures special machines according to customer specifications. For a customer from the pharmaceutical industry, the Spanish company recently developed a laser marking system for the labeling of filled tubes, which is based on the eXtended Transport System (XTS) from Beckhoff. With the new system implementation, Egaratelek managed to increase the speed of the comprehensive labeling process from 120 to 240 tubes per minute, while at the same time enhancing the quality.

Once the tubes have been filled and sealed in the filling unit, the laser marker labels the tubes with batch number, production date and expiry date. The applied labeling is then checked by a vision system, and then correctly labeled and defective tubes are sorted to be discharged separately. The main objectives in the development process were to double the labeling speed, improve the quality and reduce the number of rejects. In addition, the processing of different tube sizes (3 g and 5 g) should be enabled. The customer also required the machine to be compact, reliable, maintenance-friendly and economical.

In order to meet this wide range of requirements, Egaratelek opted for the XTS linear transport system from Beckhoff. The system takes the tubes at high speed from the filling unit to the discharge chutes, passing through the position detection and laser labeling units, and the visual inspection unit that checks the labeling.

The conveying capacity of the laser marking machine is designed for groups of four tubes. The tubes to be labeled are arranged in pairs in adjacent compartments and fed to the machine via a conveyor belt with a central splitter unit.

The machine itself consists of three cylindrical carousels: The first carousel uses vacuum grippers to pick up the tubes from the conveyor belt in pairs, takes them to a starting position in the XTS, and places them in a tube holder attached to the XTS mover. Each of these trays holds four tubes, while a vision system checks the correct positioning of the tubes. The tubes then pass through the laser section, followed by a second vision system, which checks whether the labeling was applied properly. The second carousel picks up the upside-down tubes, the third carousel discharges incorrectly labeled tubes and also picks up random tubes for quality control purposes.

A total of four Industrial PCs are used in the machine: A C69xx Industrial PC is used as a central platform for machine control, including safety I/Os. A second PC controls the XTS system. A CP6202 Panel PC with 15-inch display and touch-screen runs Scada software. The fourth IPC controls the laser marking system.

A total of 21 axes have to be controlled, including the XTS linear transport system with 10 movers. The Beckhoff drive components used in the system – AM80xx and AM81xx servomotors, AX5203 EtherCAT Servo Drives and the compact EL7211-0010 servomotor terminal with integrated One Cable Technology – ensure proper synchronization between conveyor belt, XTS and carousels. The safety solution, based on the EL6900 TwinSAFE logic terminal and safety I/Os, is seamlessly integrated into the EtherCAT network.



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XTS doubles production speed

Based on the linear transport system, it was possible to increase the tube labeling throughput to 240 per minute. The tube receptacle mounted on the XTS movers also allows the flexible processing of two different tube sizes, which is a significant benefit. The Beckhoff solution also offers significant advantages from the perspective of the machine builder: Integrated software for the XTS system, the other motion components and the safety technology simplify the engineering process. In addition, XTS offers a high degree of flexibility when



A CP6202 Panel PC is used as HMI for the laser marking machine.



This image shows the three carousels of the laser marking machine. On the right is the vision system for verifying the correct tube position on the XTS.

it comes to controlling individual movers or whole mover groups as required. Plus, XTS optimally meets the requirements of the end customer for a compact machine with small footprint and high maintainability.

Further information:

www.egaratelek.com

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