



Fully automated visual inspection system complies with highest quality standards

Chinese company Shanghai Tofflon Science and Technology has developed a fully automatic machine that uses light to inspect vials, medicine bottles, or infusion containers for glass fragments, aluminum particles, rubber grains, hairs, fibers, or other contaminants. It also detects damaged containers with cracks or inclusions (microscopic imperfections), automatically removing faulty or contaminated products. A Beckhoff Embedded PC running TwinCAT automation software controls the advanced inspection process.

Shanghai Tofflon Science and Technology Co., Ltd. was established in 1993 and specializes in the development and manufacturing of freeze dryers and complete freeze-drying systems for pharmaceutical production. The company's Customized Packaging Systems division focuses on the design and implementation of turnkey solutions for complex packaging lines and processes in the pharmaceutical industry. In the future, Tofflon plans to cover all processes before and after the production of freeze-dried pharmaceuticals as well – from washing, drying, and filling bottles, to inspection and final packaging. "Creating an open, consistent, and module-based automation concept requires a scalable and open automation platform. We believe that PC-based control from Beckhoff is the best choice for our design," explains Wang Yiming, head of technology at Tofflon's inspection systems department.

PC-based control system running EtherCAT improves processes

Tofflon runs its fully automatic inspection system with a CX5020 Embedded PC leveraging EtherCAT as the fieldbus system, a variety of EtherCAT I/O Terminals, and TwinCAT software as the integrated PLC and Motion Control platform. "Our inspection machine requires a high degree of real-time capability and control cycles in the microsecond range – features that were not possible with conventional PLCs. The EtherCAT-based control platform from Beckhoff enables outstanding synchronization performance far below 100 microseconds, which opens the door to new process improvement opportunities. Compared with the manual inspection of pharmaceutical containers, our automatic visual system delivers considerable quality improvements, detecting 100 percent of contaminants," explains Tofflon engineer Shi Yonggang.



The inspection machine detects contaminants, cracks, or inclusions (microscopic imperfections) with a high degree of reliability. Faulty containers are automatically removed.



Machine for the fully automatic optical inspection of containers for freeze-dried pharmaceuticals.



Tofflon's fully automatic inspection machine has already reached volume production.



Tofflon uses EtherCAT as the fieldbus system for its inspection machine. The data is transmitted via EtherCAT Terminals and Bus Terminals.

Further information:

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