

Application Notes

Assembly of Litmus Test Strips



Industry Insights

In the Laboratory Testing & Diagnostics sector, automation is essential to ensure consistent product quality, traceability, and precision across high-volume production lines. The manufacturing of test strips requires meticulous alignment and controlled assembly of multiple layers, as even minimal deviations can compromise test accuracy. Automated systems must therefore handle delicate parts with extreme care, maintaining high throughput and full inspection coverage. For manufacturers, reducing manual intervention while preserving reliability and repeatability is key to remaining competitive in this demanding market.

Handled Parts

This application manages litmus test strips, composed of multiple thin and lightweight layers that must be precisely positioned and assembled. The parts to be fed vary in shape and size, are delicate and sensitive to mechanical stress, which makes traditional feeding systems unsuitable. Their geometry and surface properties require gentle movement and controlled orientation to prevent bending, overlapping, or damage during feeding and assembly.



The Configuration

The automated line, developed by Cim-tech, enables full control over quality and delivery timelines. The system assembles different parts into a finished test strip through a fully automated process that combines feeding, assembly, inspection, and sorting within a single compact structure.





Key technologies include:

- Three FlexiBowl® 500 Flexible Feeding Systems replace traditional feeders, offering gentle and precise handling of fragile strip components. The controlled impulse and rotational motion evenly distribute parts, ensuring stable orientation for robotic pick-up.
- Three Epson Robots, guided by a vision system, perform the pick-and-place operations. This configuration supports a wide variety of part shapes and sizes without hardware changes, ensuring flexibility and quick adaptability.
- Three Cameras focus on quality control: one dedicated to foil inspection and two for final inspection, ensuring complete quality coverage throughout the production cycle.
- Indexing Linear Conveyor: carries two nests in parallel along the assembly and inspection stations, optimizing throughput while maintaining accuracy.
- Automated Sorting System: after final inspection, good parts are separated from defective ones, guaranteeing zero-defect output.

This integrated configuration allows Cim-tech to deliver a high-performance system capable of managing all process stages seamlessly — from feeding to final verification.

Precision and Efficiency

The introduction of the FlexiBowl® feeding systems significantly improved the handling precision of delicate components. FlexiBowl® provides a controlled and repeatable motion that minimizes part damage, reduces overlapping, and increases pick-up reliability. Combined with vision-guided robotics, it ensures 100% positional accuracy.

The multi-camera architecture enables real-time inspection at every stage, boosting quality control and allowing immediate detection of defects. The dual-nest conveyor design ensures continuous production, as assembly, inspection, and loading occur simultaneously — maximizing efficiency and maintaining high output rates.

Results

The solution met the customer's needs by combining flexibility, precision, and reliability in a compact automated system. The integration of FlexiBowl®, Epson robots, and vision inspection reduced manual inspection labor and operating costs. The system's proven quality supports the client's goals of reducing waste, increasing efficiency, and strengthening brand trust.

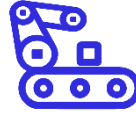
Key Points



Chemical Industry



Epson Robot



Assembly Process



Delicate materials