

Real-time glass line protection by **CUGHER** Ink Detection System

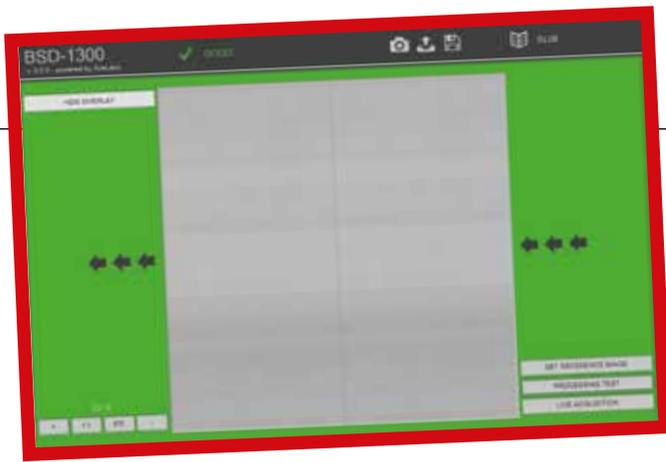


With IDS-Ink Detection System, CUGHER introduces an integrated detection solution that identifies ink residues in real time, protects downstream handling systems and supports PLC-driven process control - all while contributing to improved stability, reduced scrap and optimised production efficiency.

THE NEED FOR AN INVISIBLE YET STRATEGIC CONTROL

In digital and screen printing processes on flat glass, attention is traditionally focused on print quality. Yet a less visible factor can decisively influence the efficiency of the entire line: the presence of ink residues. Even minimal contamination can transfer to downstream handling systems after the printing machine,

compromising overall line integrity. This can lead to recurring defects on subsequent glass sheets, increased cleaning requirements, unplanned machine downtime, and potential deterioration of final product quality. The IDS-Ink Detection System was developed to address this challenge through a proactive approach: detecting contamination at an early stage and providing immediate feedback on process conditions before the issue propagates along the line.



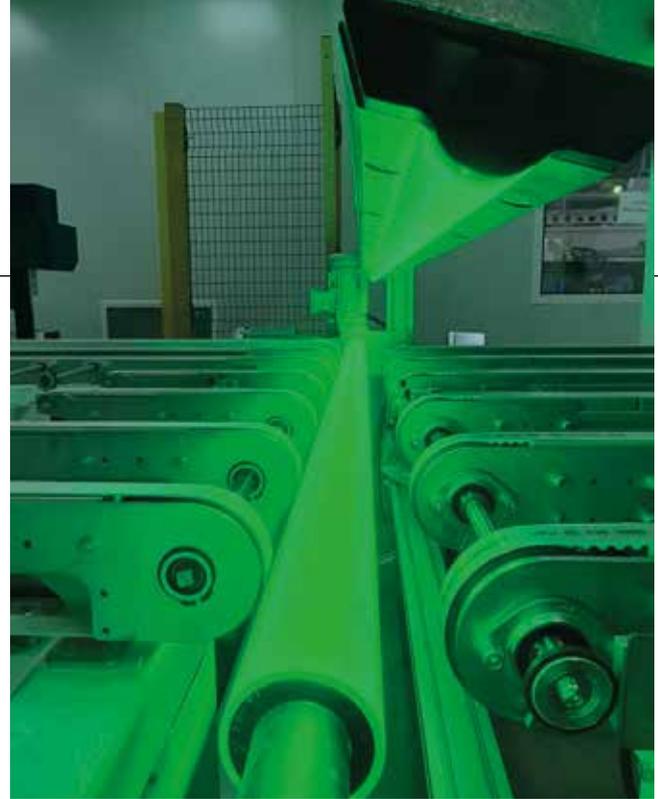
INTEGRATED ARCHITECTURE AND DETECTION PRINCIPLE

The IDS (Ink Detection System) is engineered for direct integration into the line conveyor, operating fully automatically during normal glass transfer. It requires no additional process phases and does not slow the production cycle, becoming an integral element of continuous line flow. At the core of its operating principle is a white roller that functions as a reference surface. During sheet transfer, any ink residues present on the underside of the glass are transferred onto the roller. Inspection is then performed by analysing the traces left on this surface. The roller may be integrated into a dedicated support structure within the IDS unit or configured as the first roller of the conveyor, offering flexibility for both new

installations and retrofits of existing lines. Analysis is carried out through an industrial vision system based on high-resolution 4K line-scan cameras and focused green illumination. This configuration is optimised to maximize contrast and clearly highlight black and silver inks, even in very small quantities. The system can detect ink droplets with a diameter of 1 mm (0.785 mm²) across an inspection width of up to 2000 mm, ensuring uniform control over the entire usable area. Captured images are continuously processed by dedicated software that identifies contamination and determines the result according to configurable criteria aligned with process specifications.

PLC INTEGRATION AND PROCESS CONTROL

One of IDS's defining characteristics is its direct inte-



gration with the line PLC. The system goes beyond visual reporting to become an active element of the overall production control logic. When contamination is detected, the operator immediately receives a message on the main application screen: 'Processing result: Fail!' Simultaneously, a FAIL signal is transmitted to the PLC, which can trigger automatic procedures such as alarms, glass marking, or a controlled line stop. In the absence of contamination, the system displays 'Processing result: Good' and sends a GOOD signal to the PLC, confirming process integrity. This mechanism not only protects handling systems but also enables early identification of potential issues within the printing process, including suboptimal settings, out-of-specification parameters or application anomalies. IDS therefore functions as a continuous monitoring tool, contributing to process stability, scrap reduction, and protection of overall plant investment.

SMART PREVENTION TO SAFEGUARD THE LINE

The IDS - Ink Detection System introduces a proactive approach to contamination control, transforming a potential critical issue into a monitored, real-time process parameter. By promptly detecting even minimal ink traces, the system helps safeguard line components, reduce the risk of recurring defects, and limit unplanned maintenance interventions. At the same time, IDS enhances overall printing process control by delivering objective feedback on line operating conditions. It represents a further step toward increasingly integrated and reliable systems designed for maximum production efficiency, fully aligned with CUGHER's technological approach.



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