Intravis presents Industry 4.0 applications

Smart factories are becoming a reality

By displaying a Closed Loop link between an injection moulding machine and a vision inspection system, Intravis GmbH demonstrated the benefits of its Industry 4.0 solutions. Specifically, the specialist in quality control for the plastics packaging industry is showing how the combination of high precision inspection system and analysis software can minimise scrap by using an intelligent approach.

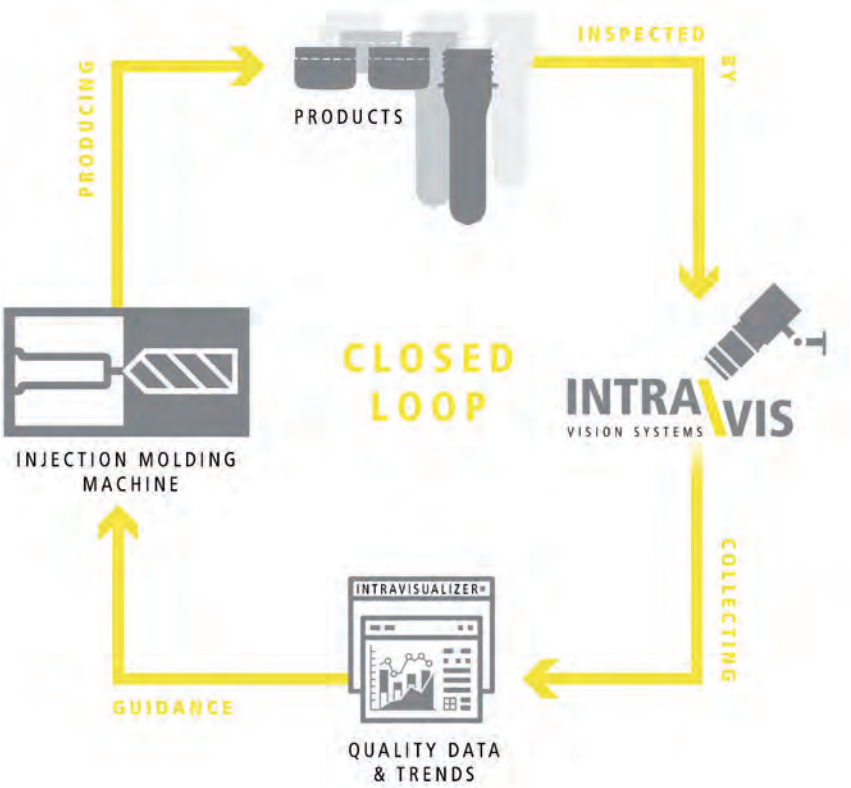

Diagram of a closed loop link between an IMM and an Intravis vision system

Industry 4.0 remains the buzzword in manufacturing. In the production of plastic packaging, it stands for a fusion of the most modern IT benefits with current production technologies. The goal is to achieve improved time and cost efficiencies in production while not compromising product quality. Intravis has been focusing on the latter for years by combining state-of-the-art inspection technology - with hardware and software. By using its vision systems to not only inspect but to improve production, Intravis is becoming “the eyes of Industry 4.0”.

“Closed Loop” realised

At last year’s Drinktec in Munich, Intravis presented their vision of the future for quality control for the plastic packaging industry. Together with Netstal, a functioning Closed Loop link between an injection moulding machine and a vision inspection system was presented for the first time. Every part being manufactured has its quality parameters inspected by the vision inspection system. The resulting data is analysed and summarised into trends. This precise data powers the Closed Loop’s effectiveness. The data generated during the quality control is transmitted to the injection moulding machine, relaying detailed information about the parameters of the object within a short time. With this constant information interchange, operator interventions are reduced to a minimum. On the basis of the analysis results, the injection moulding machine automatically regulates its corresponding settings. This Closed Loop relies heavily on the precision of the measurements performed; the more precise the quality control, the better the data, the better the analysis and the more successful the regulation of the manufacturing process.

Intravis demonstrated the functionality of the Closed Loop link by means of the diameter inspection of beverage closures produced at the trade show. “By changing individual settings on the injection moulding machine, a deviation of the diameter from a predetermined tolerance range was deliberately created - the simulation of an external influence”, says Dr Gerd Fuhrmann, CEO of Intravis GmbH. “Our high-precision vision inspection system, a CapWatcher III, directly determines the continual deviation of a parameter, in this case the diameter. It immediately reports this deviation back to the injection moulding machine via an OPC UA interface.

Based on the transferred data, the injection moulding machine starts a self-correction process and produces closures within the tolerance limits within a very short time. After a few production cycles, everything is back within the tolerance range.”

Advantages of a Closed Loop

The advantages of such a fast self-regulation are obvious: Less scrap and rejects are manufactured. This increases the effectiveness of a line and its yield. In addition, the manual intervention of an operator is reduced significantly, which makes the production less susceptible to improper operation. This means energy savings and improved sustainability. The use of a Closed Loop link is not limited to the production of closures. It can also be integrated into other plastic packaging manufacturing processes.

The CapWatcher III Print as part of a Closed Loop link at the booth of Netstal

Increased efficiency

Even though the widespread use of self-regulating production lines is in its infancy, Intravis' products provide valuable insights that enable machine operators to make qualified decisions for regulating the system in a shorter time. The IntraVisualiser software transforms and measured results of Intravis systems into easy to read graphs.

The user can monitor all equipped lines easily and simultaneously. Customisable time periods such as batches, shifts, or days can be visualised. If necessary, the IntraVisualizer also creates trend statistics with additional calculation of future trends, which helps to minimise the reject rate. The IntraVisualizer analyses the progress of the measured results of selected product parameters and predicts when a value will permanently deviate from the desired nominal value. The value Estimated Time to Failure (ETF) is then displayed or communicated via email alert. Now the alerted operator has the opportunity to intervene before the tolerance limit is exceeded. This avoidance of rejects creates material savings, higher productivity and efficient maintenance.

Intravis continues to expand its vision system offerings to stay on the leading edge of "Industry 4.0". The IntraVisualizer, in combination with Intravis vision inspection systems on each production line, provides comprehensive insights into the production process, including Estimated Time to Failure (ETF) analysis. Furthermore, the Closed Loop link makes it possible to detect and correct certain process drifts within an incredibly short time. Intravis remains strongly committed to making its vision equipment the "eyes of Industry 4.0" for the plastic packaging market.

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