



The highest speeds: almost 1,000 parts per minute are fed to the main tower by a satellite.

New ideas for more performances

The sportscaps market has been a tough competitive environment from the start. In recent years, participants have been focusing on the effectiveness of their productive systems to secure a competitive edge. The goal has been to produce more parts per minute from within the same installation area.

One solution has been pursued by Contexo, the machine builder from Winterbach in Germany. Contexo's engineers have integrated comprehensive quality-control and TE-proof feeders into compact continuous-motion systems. Their machine can be directly chained with an injection-moulding machine, and moments later pack the finished and fully inspected cap. This means high output rates are now possible on a small installation area.

"The challenge was to build an exceptionally reliable and fast assembly machine on a small footprint", recounts Jürgen Müller, CEO of Contexo. "In our opinion, continuous motion combined with feeders for warm-moulded parts, and with direct inline inspection of those parts is the most effective solution."

Contexo is currently using this technology to build a machine for one of the largest beverage-closure manufacturers. It counts as the third Contexo machine ordered by the client this year. This means that production at the company will be state of the art. Machine tests confirm expectations: 1.3 million parts per day with 100% reliability. One sportscap is assembled, folded and inspected against 13 quality-control criteria every 6-hundredths of a second.

Higher capacity through innovative feeding, fast assembly and inline control

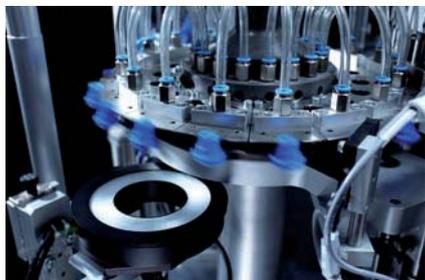
Contexo reaches these high speeds using continuous-motion technology. A central tower with 36 tools assembles the parts, feeder satellites

guide the parts at a perfectly controlled speed. This means each part experiences minimal stress and wear during assembly. Contexo has been investing in continuous-motion technology for over ten years, and in that time further developed it.

"When we started with continuous-motions systems over ten years ago, we were one of the fastest at 300 parts per minute. Now we are three to four times faster," explains Jürgen Müller.

However, assembly speed is only one condition required for high, market-conform output rates. The market now expects zero defects. End products have to be 100% flawless. This is why many producers have launched additional inspection machines in recent years. But they

can only inspect the assembled parts after the production process. This results in a larger installation area and slower completion times – and a finished closure cannot be illuminated with full reliability.



Quality control of individual parts: the parts are first inspected before assembly for any defects that would be difficult to detect in the finished closure.

Inline inspection before and after assembly

For this reason, Contexo has adopted a different method for quality control: the individual components are inspected before assembly, the finished closure is inspected after assembly. For this to work, the inspection systems are integrated, inline, into the assembly machine and work in sync with it. The endeavour is a cooperation between Contexo and Intravis, a German supplier of vision inspection systems for the plastics packaging industry.

“As the output rates of continuous-motion technologies improved, we quickly noticed limits to its speed in the area of part inspection. We have

found a great partner in Intravis, who provides us with exactly the support we need in the integration of inline inspection systems into our high-speed systems”, explains Müller.

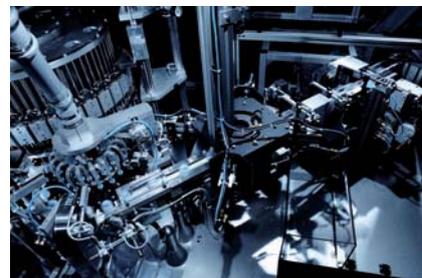
Contexo has fully integrated the Intravis CapWatcher system into their machine concept. The additional system enables the comprehensive inspection and evaluation of all of the sportscap's features. Before assembly the spout is for example checked for geometrical characteristics such as diameter or ovality, contour defects as well as a flawless plug seal. After assembly the whole closure is inspected for assembly faults, defective or missing tamper evident bands, contour and geometrical defects of the body and even if the closure is opened.

Chained TE-proof feeding with injection-moulding machines

At high assembly speeds, reliable feeding is the primary and largest challenge. These performance rates can be too much for existing feeder technologies. At high speeds, they cause pearlescence and other damage to the fed-in parts.

Contexo therefore had to develop their own TE-proof vibration feeder. To ensure continuous flow, the solution is an especially stable unit capable of 80% overcapacity and can process warm-moulded parts directly from

the system. This means sportscaps machines can be directly chained with the injection-moulding machine and feed in the parts without human logistics or contamination.



Full inspection: the closures are examined from all sides on an inspection belt.

The key to success: Continuous motion, vibration feeding and inline vision inspection

The expansion of the purely continuous-motion unit into an inspection instrument and injection-moulded-parts feeder appears to be a trend-setting step towards higher effectiveness. The concept tackles the most severely limiting factors of sportscap production.

By chaining injection-moulding machine, assembly unit, vision inspection system and packaging system, Contexo offers a space-saving and effective alternative for manufacturing sportscaps.

www.contexo-gmbh.de
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