

# Improving hot end ware handling performance

CHRISTIAN FRÖBA EXPLAINS HOW AN INTEGRATED HOT END WARE HANDLING SYSTEM CAN AID THE OVERALL EFFICIENCY OF THE IS PRODUCTION LINE



A 10 SECTION NIS 5-INCH TG WITH FLEXPUSHER

**I**ncreasing production speeds and larger machines are providing production speed limitations for ware handling; 12 section quadruple gob (QG) machines and large 12 section triple gob (TG) machines are real challenges. Demands for flexibility and the range of container designs increases complexity for stable ware handling. One of the main components of hot end ware handling is the pusher mechanism on the IS machine.

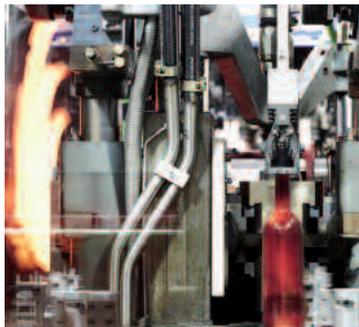
When the forming process is complete and the container stands on the dead plate, hot end ware handling starts. At this part of the container production process good containers can only be damaged or completely lost, so it has now become a major area for improving overall productivity.

It is also important to ensure that no additional defects are created by the ware handling process itself. Falling containers, coating tunnel jams and damaged and poorly aligned bottles at the stacker are typical examples of areas where productivity is lost. Poor ware handling also weakens and damages containers, typically with cracks, checks, surface scratches and shape deformations. Stable hot end transportation saves a lot of time as well as good production during start-up, allowing the operators and production specialists to stay focused on forming issues. Container handling also has a significant influence on job changes, especially during start-up.

## INTEGRATED WARE HANDLING

High performance IS lines operate with belt speeds of around 1 m/s with a good pusher system and other high performance components such as the conveyor belt, ware transfer and drive system. An unequal stretch of the conveyor belt, for example, results in peaks in the velocity of the belt, which can lead to unequal and inconsistent container spacing.

The development of the FlexVector Drive integrated the drive system for the feeder, conveyor, ware transfer, cross conveyor and stacker. The FlexIS Ware Handling Controller (WHC) is now available; it integrates the drive systems for the conveyor, ware transfer and cross conveyor into the FlexIS control system, giving smoother operation with less operator interference and higher hot end pack rates. Supervision of the belt speed, ware spacing and hot end ware reject will



THE FLEXPUSHER IN TRIPLE GOB OPERATION ON AN NIS MACHINE

soon be possible with one fully integrated system which can react to any drift in the process, such as an automatic belt speed compensation caused by the stretching of the conveyor belt.

The start of the hot end ware handling process is the pusher mechanism on the IS machine. The positioning of the bottles and the spacing on the conveyor belt is determined by the push-out motion of the pusher mechanism. Traditional pusher systems have servo rotary action and pneumatic extend and retract motion. Pneumatic valves with speed controls for the cylinder motion are not precise enough and the repeatability and reproducibility may not keep up with demand. Machine speeds can often be increased but ware handling cannot always cope with the production speed.

## USING SERVO DRIVES

The development of the FlexPusher two-axis servo pusher mechanism eliminates the deficiencies of a pneumatic motion by using two dynamic servo drives for the entire pusher motion, meeting the challenges created, for example, by high speed production from 12 section NIS quadruple gob machines. The controls are fully integrated into the FlexIS process control system, providing a complete and continual control concept for the IS line.

The FlexPusher is also available as a standalone system for upgrading existing production lines or for non-FlexIS installations. The system uses a specially designed dead plate space to provide a smooth sweep-out, without compromising on the container dead plate time. It incorporates 'pocket air' technology with the new 'pusher finger' concept, allowing a flexible use of different finger liner inserts so the fingers can be adapted easily and are cost-effective for different container sizes and shapes.

Hot end ware handling is an important part of glass container production. The new Emhart Glass systems are available with the FlexPusher and the FlexIS WHC to overcome current restrictions and push speeds of 700-800 containers per minute. ■

### ABOUT THE AUTHOR:

Christian Fröba is Product Manager Ware Handling for Emhart Glass

### FURTHER INFORMATION:

Emhart Glass SA, Cham, Switzerland  
tel: +41 41 749 42 00  
fax: +41 41 749 42 71  
web: [www.emhartglass.com](http://www.emhartglass.com)

### WORLDWIDE CONTACTS:

For a complete list of contacts around the world, see the website