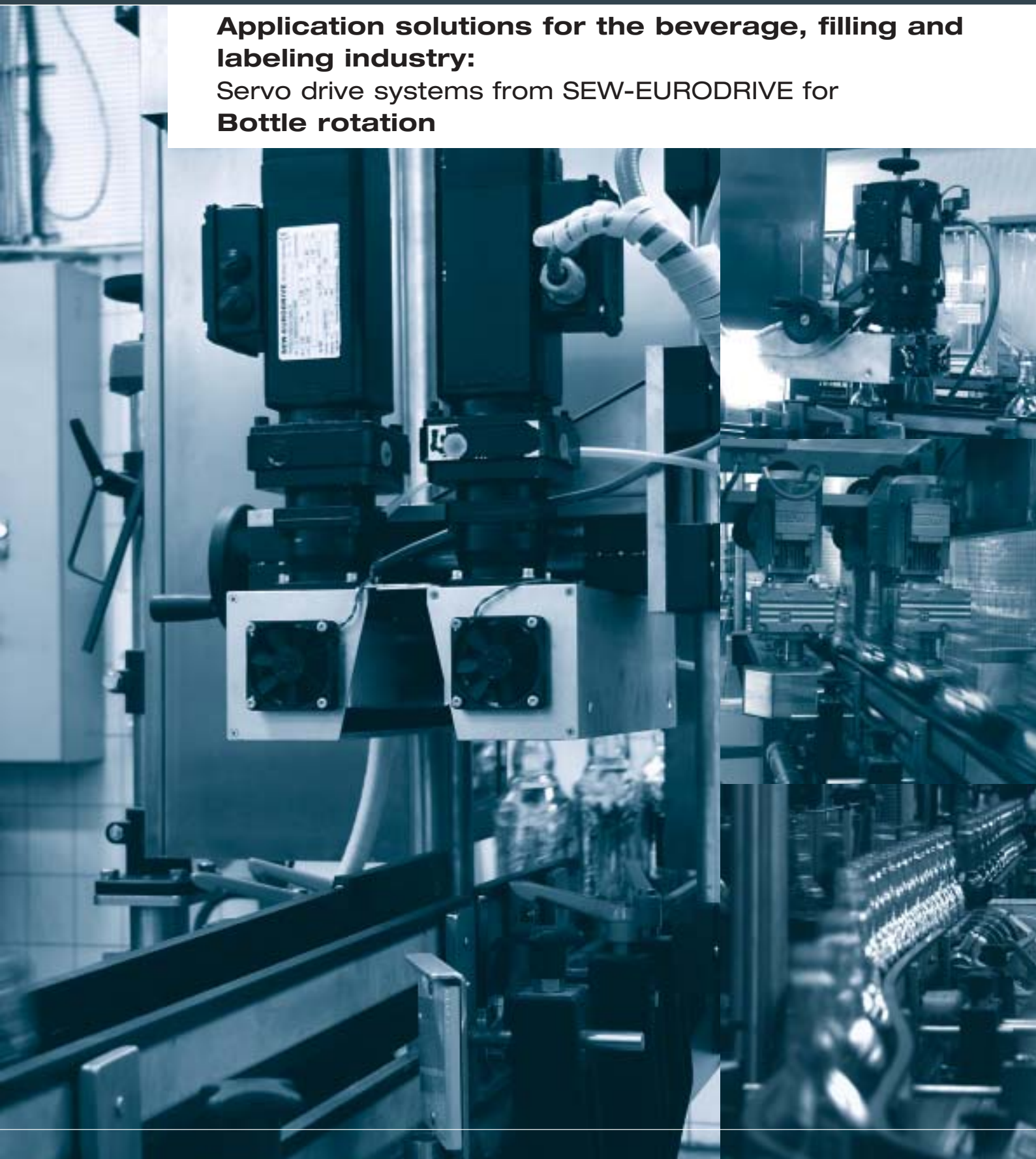


Application solutions for the beverage, filling and labeling industry:

Servo drive systems from SEW-EURODRIVE for
Bottle rotation



Turning and filling – with a fast and accurate rotation of the bottle



Borco-Marken-Import in Hamburg uses a new bottling plant from Meypack (located in Appelhülsen) to bottle the “Sierra Tequila” brand of tequila. This system has a special feature that sets it apart from similar ones: Profile bottles with a design on the front and back, which are turned in the same direction at high speed prior to filling. The mechanical and electrical design of the handling equipment, including the optical orientation detection system, was developed by Filtec Europe GmbH, a specialist in optoelectronic inspection and laser coding systems, based in Hamburg.

Application description

A camera system records the necessary turning angle while a specially-developed turning device lines up the bottles. A metering unit is positioned before the filling station to ensure there is a defined gap of 250 mm between the bottles. The thread molding or a sign on the bottle is used for detection. The data is stored in a ring buffer because the camera records several bottles between the time when a particular bottle is recorded and when it is actually turned. The data is sent to the turning device which applies the required amount of turn.

Criteria

- Optical detection of a label or detection feature
- Data storage and subsequent retrieval
- Defined speed for bottle transportation
- Defined gap between bottles
- Rapid and exact bottle rotation at a defined time within a flexible time specification

Objective

The existing bottling plant could no longer cope with the increasing demands for a higher production rate. To increase productivity even further, a more flexible, functional system had to be installed. The turning device picks up individual bottles by the neck, clamping them between two belt pairs. Each belt pair is driven individually by a synchronous servomotor and a MOVIDRIVE® drive inverter, type MDS as a master and slave axis.

Technological requirements

- Increase in productivity from 6,000 to 10,000 bottles per hour, reduction in time required to turn the bottles
- Synchronous operation of different transport systems
- “Drawing a gap” functionality
- Much faster turning motion
- Shorter response and proximity switch evaluation times



Regardless of whether you use a dynamic drive or intelligent control – the perfect combination of products from the servo drive system realize every task cost-effectively and extremely efficiently!

SEW-EURODRIVE solution

In the new bottling plant, the master drive moves its belt pair at the speed of the flat top chain that transports the bottles. As soon as a bottle has to be turned through a particular angle, a defined speed difference between the master and slave is applied for a defined length of time so that the turning operation is performed correctly during the transport. The program for performing the task was written using the standard IPOS^{plus}® positioning and sequence control system in the MOVIDRIVE[®] drive inverter. This solution enabled the company to achieve the targeted throughput of 10,000 bottles/hour.

Components

- Smooth, real-time online change of gear ratio factor in synchronous operation
- Direct synchronous operation of two inverters
- All control tasks, including the sensor and local I/O processing are decentralized and performed independent of the PLC in the MOVIDRIVE[®] drive inverter. They are realized using the IPOS^{plus}® integrated positioning and sequence control system.

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