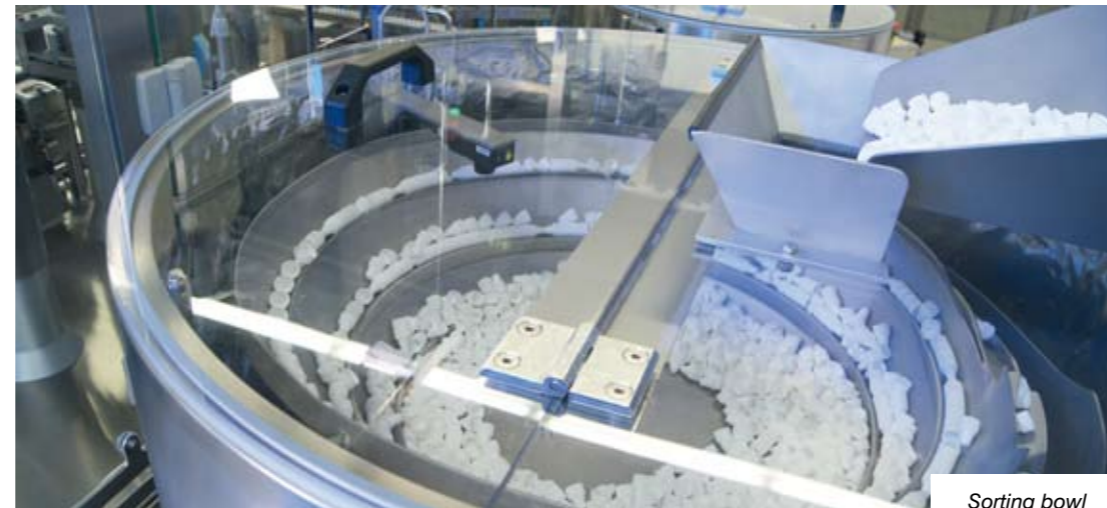




Filling



Sorting bowl



Pre-torquing

FOR DIAGNOSTIC PRODUCTS

Versatility - a class act

If you don't know which products will be going through your filling line a few months or years down the road, you either have a problem or a Kugler LINOLINE. The application discussed below involves glass and plastic containers, vials and bottles in 23 different sizes and sealing variations.

To meet the applications profile, the infeed to the KUGLER LINOLINE had to contain both a bottle sorter and an infeed turntable. When plastic bottles are being processed on the line, they are loaded in bulk into a disk sorter. An optical inspection station checks to ensure that the bottles are oriented correctly for transfer to the linear transport system. Pressurized air is used to return bottles that are not in the proper position.

Glass bottles and small batches of plastic containers are loaded into the line via an infeed turntable. The turntable is designed to handle all containers that are processed on the line no matter how they are loaded into the machine. Further processing takes place at single-position stations.

Everything under control

The containers are ionized to reduce static charge. This is particularly important with plastic bottles. The filling and sealing process begins when the containers enter the KUGLER LINOLINE. A 100% in-process tare check is performed on the bottles. One or two peristaltic units then fill the bottles depending on the predefined recipe. The containers are then weighed again to determine the gross weight and to calculate the net fill weight. The results are used to continuously correct for drift to optimize filling accuracy, in addition to checking the maximum and minimum weights.

The containers then continue on to the sealing station of the KUGLER Linoline. Droppers are retrieved from the sorting

bowl and pressed onto the containers or, depending on the configuration, a cap is placed on them and partially tightened. Final tightening takes place in an additional process step, and a check is made to ensure that the torque is within the tolerance. Torque can range between 20 and 212 Ncm. Underweight or improperly sealed bottles are rejected.

However, there are more variations which have not only different sizes but also different shapes (square and oval), and the machine also handles molded and snap-on caps. Square containers are transferred to the linear process by the same disk sorter that loads the round containers. The same feed module used for the round bottles also handles the snap-on caps. Instead of screwing the caps on, the servo motor that normally drives the tightening spindle is positioned at a pre-defined rotational angle so that the snap-on cap can be inserted into the longitudinal slot on the bottle. A camera then verifies that the cap is in the correct position.

All of the containers pass through the integrated labeler on the line. The diagnostic products are separated and spaced at a defined interval. The containers then pass through the labeler at high speed. The bottles rotate in the labeler to ensure that the labels are uniformly applied. Cameras verify the placement and content of the labels before the finished containers

The future is already built in

It is not yet clear what size and shape containers the KUGLER Linoline will be handling in the future. From the user's perspective, format handling capability that goes beyond the norm is a major consideration in addition to system

reliability and rugged design. As the line is designed to handle containers with diameters between 16 mm and 95 mm (round) or 30 - 90 mm (square), heights between 25 mm and 175 mm and cap diameters up to 50 mm, the customer has plenty of flexibility. Two more filling heads can be added to increase throughput if necessary. The bottle sorter/turntable combination also provides the option of loading nearly any container or bottle manually.

Customers looking for lines that handle a wide range of sizes and/or shapes normally want quick changeover. On this line, changeover takes no more than 20 minutes. The throughput rate for

containers between 1.1 and 60 mL is up to 60 containers/min. The rate for larger containers is 40 units/min. The accuracy of the peristaltic pumps in combination with 100% in-process verification tested at better than $s_{rel} \pm 1\%$ (standard deviation).

There are other efficiency savings as well. The KUGLER Linoline replaced two older machines which were significantly more labor intensive. Because less effort is needed to operate the line, the employees can now concentrate on final packing and keeping an eye on the cGMP and CE certified line which was produced within a period of eleven months and delivered to the UK in October 2010. ●



Kugler LINOLINE