Assortment production offers short run benefits

Nicola Hargreaves discusses assortment production, a solution for more flexible and small batch production in the glass container industry.

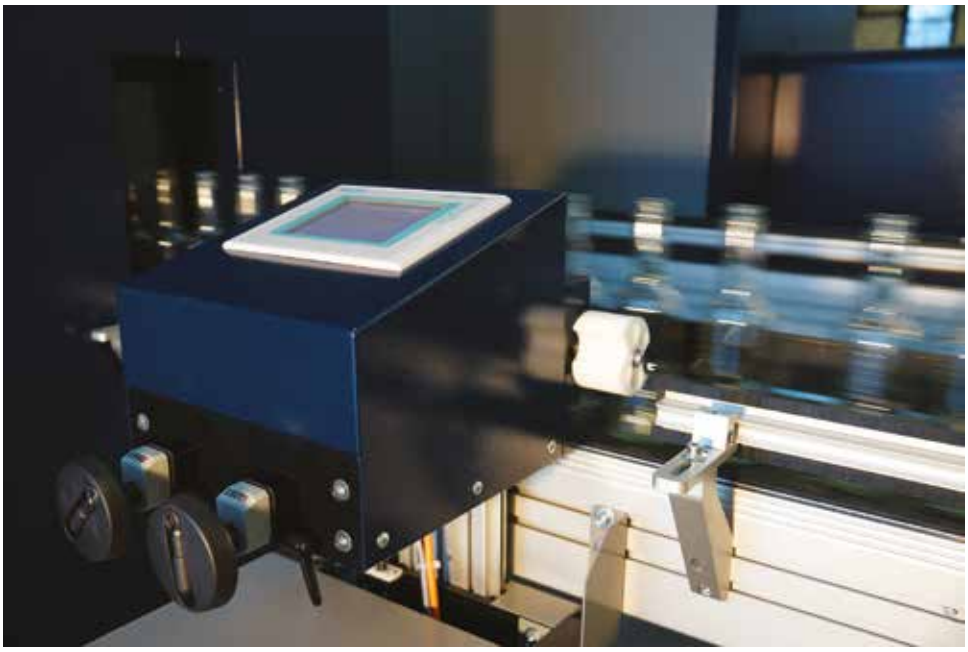
To allow customers to buy containers in batches that meet their needs, many glass manufacturers produce smaller batches. This, however, results in frequent, time-consuming and inefficient job changes, due to the short production times involved. A solution to this predicament is assortment production, which involves producing more than one type of container on one production line. This decreases the frequency of job changes, thus resulting in a lot of otherwise expensive time being used for production rather than standstills for job changes.

Instead of changing all legs of a cold end line to one type of container, they are set up for different containers, resulting in more constant production, with fewer breaks. To undertake assortment production, containers must be reliably sorted, according to type, to the correct tracks.

Width	1000mm
Height	2215mm - 2500mm
Depth	1070mm
Speed	Maximum 750 bottles/min
Product diameter	Maximum 140mm
Product height	Maximum 375mm

Width	400mm
Height	1000mm - 1400mm
Depth	470mm
Speed	Maximum 1500 bottles/min
Product height	Minimum 70mm

Allocator technical data.



Allocator with passing bottles.

Well known for its innovation, article handling and manipulation systems in glass plants, Bertram Elektrotechnik GmbH has developed the Separator, an image processing system with up to three cameras, which can detect even the smallest differences between products, ensuring that each product is always sent to the correct track. This system sends a signal to the Allocator, a servo-driven distribution system.

Separator with the door open, showing the user interface and a jar passing through the camera system.

Separator with attached Allocator.

For complex products, the Separator can also be used with compressed air or other handling systems, such as pushers.

Due to the arrangement of cameras inside the machine, no mechanical adjustments need to be made for different product types, resulting in short job change times. The operator only needs to set which products are to be allocated to a certain track, which is simple on the user interface, or 'teach a new product in'. The process of 'teaching the products in' can be carried out very simply by any operator. To do this, the operator must enter the name of the container, then let a few examples of the product pass through the machine on the conveyor belt. Certain features are automatically selected from the image taken in this process that are then used to recognise the container type during production.

FLEXIBLE CAMERA APPROACH

The Separator can be used with a single camera for simple products with large differences, or with three cameras for more complex products, such as two almost identical products with and without embossing. The light sources in the system use infrared light that is not visible to the human eye and is not affected by other light sources. It recognises the product type by comparing the features of the container, such as the size, shape, colour, embossing, mouth etc in the image taken of the product to those of the previously 'taught-in' products. Using an integrated industrial computer, the Separator controls the connected handling systems, such as the Allocator, based on the acquired image data.

The Allocator is a servo-driven distribution system with an eccentric cam that pushes glass containers onto the adjacent track. It is completely adjustable so that the product is always met at its centre of gravity, ensuring stable product handling. Even at high speeds, this technology ensures the same, secure motion every time. The system can be used as described alongside the Separator, or stand alone as points.

Due to its small size and use of servo motors as opposed to pneumatics or compressed air, the Allocator saves space, as well as running costs. Each product is allocated with a cam rotation of 180°; this ensures that the Allocator is immediately ready for the next container as soon as it has finished the previous action. It is therefore possible to distribute products in a continuous product flow, without gaps, where other systems with a linear action must travel back to their starting position before they are ready to repeat the process and thus require gaps between products.

Separator and Allocator can work together or separately from each other to ensure effortless and efficient sorting of products without interrupting product flow. The Separator can control any number of Allocators, thus allowing as many product types to be allocated as needed.

Many manufacturers only produce large batches, due to the time and costs associated with job changes. Using assortment production could make a number of manufacturers, large and small, more flexible to produce more varieties of container and react to customer demands more quickly. Technology is available to ensure that manufacturers can reliably produce more than one product on a line, which can cut the number of job changes drastically, thus increasing production times and lowering costs. ■

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