glass WORLDWIDE

Speaking the same language – bottle ID and container code potential

In the September/October 2020 issue of *Glass Worldwide,* an overview article discussed the importance of data being translated between the different systems. In the next of a series of articles, a more detailed view is provided by Thomas Bewer on the challenges that are involved to achieve a complete container production data history and therewith, the traceability of the container during its life cycle.

Glass container production lines are equipped with an increasing number of sensors and equipment to stabilise the production. With the availability of data from these sensors, it becomes obvious that this data must be analysed to optimise glass container production. The challenge in obtaining a complete and meaningful data set is to assign the data of all involved systems to the 'right' container. A lot of different components from both HE, CE and Traceability equipment have to work hand-in-hand and speak the same language (as can be seen in figure 1).

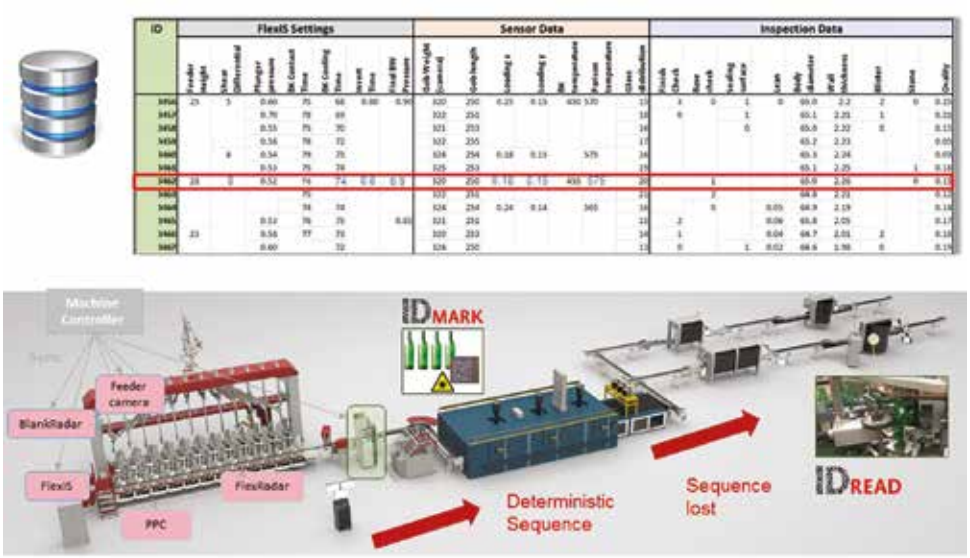

Figure 1: Correlation of forming and inspection data by a container ID.

Container ID connects forming and inspection data

BEG solves this challenge by introducing a container ID that is followed through the forming cycle and is communicated to all controllers of the FlexIS and to the installed measurement systems. By doing this, the FlexIS data and settings are correlated to the sensor/measurement data – for each individual container.

The container ID is the connecting link. To also correlate the inspection and forming data, it is essential to mark the container at a point of time when the cavity in which it was produced is still known. This means it has to happen before the lehr as otherwise, the deterministic sequence of the containers is lost. The marking system ID Mark does this job by laser marking a code on the individual container using a CO_2 laser. The container ID and the code marked on the container are correlated. By reading the code in the inspection machine and correlating it to the inspection results, the connection of forming and inspection data is possible.

This set-up enables a complete data set to be collected for big data analysis of the forming process. Further data from the batch house, the furnace and the palletisers can be related by time stamp correlation. BEG started its first research projects with data gathered with the complete set-up in its research facility in Windsor.

Tracing the bottle through its life cycle

With 'only' data collection in mind, it does not matter what type of code is marked on the container, as long it is unique for the production line. However, there are major benefits along the container life in having a worldwide unique code, as the container code acts as a link/translator between the different actors along the value chain (figure 2). For example, in the case of a recall, a container can be identified and the corresponding data set can be requested at the production facility. The gathered data is the basis of a fact-based discussion.

In order to foster the above opportunities, a code definition was proposed by a working group of Cetie (www.cetie.org), consisting of members from glass producers, traceabilty manufacturers and fillers. Figure 3 shows this code definition.

With the introduction of a root code structure of 16

Figure 2: Opportunities opened up by marking a worldwide unique code on the bottle.

Code laser marked on the hot glass container.

characters, it is ensured that even for lines running at high speed, the containers can be marked. An important element to ensure a worldwide unique code is that a worldwide unique line number is used. The line number will be issued by Cetie on request of the glass producer. This service is free-of-charge. If the machine speed allows for bigger datamatrix codes, codes with more code content can also be marked.

Another important aspect is the position of the code on the container. There are different interests involved. First of all, the code needs to be marked and read. There are a couple of criteria that need to be taken into consideration; detailed recommendations can be found in a document issued by Cetie. Further criteria for the code placement are the requirements of the filler. Depending on his use case, the code should be either clearly visible (eg for marketing purposes) or hidden (eg for anti-counterfeiting).

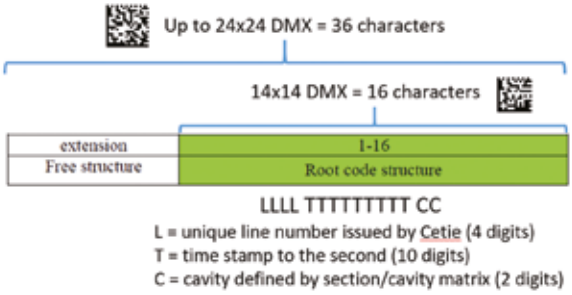

Figure 3: Code definition following the Cetie recommendation.

Small numbers – huge potential

This article explains that the introduction of two small numbers – the container ID to connect the forming and inspection data and the code marked on the hot container – opens huge potential for optimising the glass forming process and creates interesting new possibilities along the value chain of container glass usage. Using this potential will further increase the competitiveness of glass against other packaging materials. ●

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