

# Bits and bytes add more dimensions to glass containers

The numbers speak for themselves: the annual production capacity of the 15 factories totals almost four million tons of glass containers, making Guangdong Huaxing Glass Asia's largest hollow glass manufacturer and a major league player at the global level. Thanks to support from Siemens, the company's comprehensive digital transformation also follows a clear strategic plan that is all the more effective on this scale, as Heinz-Josef Lennartz explains.

Everyone in the industry now acknowledges that Guangdong Huaxing Glass Co Ltd, headquartered in Foshan City, China's Guangdong Province, is Asia's largest glass container manufacturer. This privately-owned business headed by founder Li ShenHua boasts an annual production capacity of nearly four million tonnes and annual sales that currently top seven billion RMB, accounting for about 15% of the domestic market.

The company produces glass containers that are mainly used in the domestic food and beverage, pharmaceutical and cosmetics industries, among others. The range is impressive. Guangdong Huaxing Glass is able to produce glass containers in weights from 25g to 2000g, with capacities from 20ml to 5000ml, in all shapes and quantities. The colour palette extends from ultra-white and clear compositions to emerald green and tawny brown, with more than 3000 possible container designs.

"For companies of this size, it's obviously highly effective to approach the digital transformation systematically and strategically" says Heinz-Josef Lennartz, who has been working closely with customers for many years. Mr Lennartz is in charge of providing consulting services in the areas of digitalisation, as well as project and customer development, including to Guangdong Huaxing Glass, for vertical glass and solar at Siemens.

## All-around expertise

Like Guangdong Huaxing Glass, any company that pursues digital transformation with Siemens at its side benefits from a comprehensive approach known as Digitalisation Consulting. "Our teams combine industry-specific knowledge ranging



Bottle production at Huaxing.

from raw materials to the finished product with our expertise that extends to the field, automation, process and corporate management levels and includes the specific associated IT requirements" says Heinz-Josef Lennartz. "This is the expertise power that traditional consulting firms are often unable to provide."

Add to this a thoroughly tested technology portfolio specific to the glass industry and Siemens' international experience, including an on-site presence "that's unfortunately but understandably limited by the pandemic" Mr Lennartz adds.

## Systematic from the start

When Guangdong Huaxing Glass – on the initiative of CEO Li ShenHua – began working with Siemens to initiate the gradual transformation process in April 2019, daily life was still more or less normal. On-site workshops were often attended by Li ShenHua and he revealed himself to be extremely open to this European-style consulting approach.

The workshops were held in order to formulate answers to extremely basic questions on what the Siemens experts wanted to know from their customer contacts: What are your

digitalisation goals? Why do you want to digitalise? What economic factors and motivations are behind your decision to start the transformation process? By the end of this focused discussion, the company's primary objectives were clear. At the very top of the list was the desire to significantly boost productivity across all production sites – by about 9%! In this context, experts also refer to the pack-to-melt ratio. This is the ratio of manufactured melted glass at the hot end to pallets of packed goods at the cold end. What it means in practical terms is that bottles with small scratches have generally ended up as scrap. Better cullet management would be able to reduce this scrap.

"It turned out, for example, that the external cullet required much more thorough cleaning during processing" says Heinz-Josef Lennartz. This is closely linked to the target quality, which is also important to Guangdong Huaxing Glass. The Siemens team working on-site was able to determine that the frequent changeover of capacities from order to order had a negative effect on quality and productivity, while also increasing power consumption.

Uniform output quantities, on the other hand, would improve glass quality and reduce power consumption. The result was a natural conflict of interests. Uniformity could be achieved at the expense of vital flexibility in production. "One of our many tasks in the consulting process was to balance and weigh the goals and their achievement as best we could, meaning optimal flexibility combined with optimal quality, productivity and power consumption performance" Mr Lennartz explains. "It soon became apparent to all those responsible that this could be achieved only with the aid of digitalisation, using sophisticated automation solutions."

## Careful analysis and evaluation

Another important component of the analysis was the systematic examination of all processes, as well as the entire IT and OT infrastructure in the factories, including horizontal and vertical integration.

During inventory, Siemens worked with the customer to consistently identify all optimisation potentials so that recommendations for action could be documented in an implementation roadmap. For example, it was determined that many data sources were unconnected and that it was not possible to access quality metrics in real time; for raw materials, for the particular form the products currently assumed in the process and even at the end when the quality of the finished products are assessed. In addition, all planning, documentation and evaluation were being performed manually, without software support.

## Implementation roadmap as itinerary

The tangible result of about two months of on-site consulting was

a product-neutral automation and digitalisation roadmap with a five year plan and return-on-investment calculations. The roadmap is a practical plan of action that can be implemented by the company that is receiving consulting services or is taking advantage of Siemens' integrated solution portfolio comprising hardware, software, communication, security and services.

On the (process) control level, for example, Guangdong Huaxing Glass opted for the Simatic PCS 7 system for monitoring and controlling all the technological processes of machines and plants. According to the roadmap adopted in August/September 2020, an MES will be used for the first time on the operations control level (Opcenter Execution Process) and connected to the SAP ERP system.

On the corporate management level, Guangdong Huaxing Glass chose XHQ, an operations intelligence dashboard solution, as a useful application for the operating phase. XHQ supplies the relevant

system-wide data and KPIs in real time, which also makes it possible, for example, to draw comparisons between different plants at multiple locations.

"One important aspect of the implementation process that has already been started is that we are providing targeted training for all 10,000 employees at the 15 locations and to prepare them for the digitalisation projects that are still pending. The work in some areas will become more demanding or sometimes turns into a different type of work because data has to be acquired and ideally, evaluated. The third step is then to follow up the analyses with appropriate actions" Mr Lennartz explains.

CEO Li ShenHua is in full agreement. "What Siemens has achieved in recent months makes a lot of sense. In addition to their professional expertise, what's been most important for me is the extremely open relationship on our path to success, which is far from over! Above all, I'd like the team to continue meeting in person. Digitalisation has its justifications but it's no substitute for personal contact" Mr ShenHua concludes. ●

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