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Taking container production technology to the next level

The forerunners of Bucher Emhart Glass were pioneers of IS forming technology more than 100 years ago. Today, the company's approach to the development of innovative manufacturing technologies continues to advance, as members of the company's senior management team explained to *Glass Worldwide*.

Martin Jetter, President, Bucher Emhart Glass.

According to Martin Jetter, President, Bucher Emhart Glass is the only player in the industry who offers a complete machine portfolio, including traditional pneumatic IS machines (IS and AIS), modern servo IS machines (NIS, BIS), mechanical and vision inspection machines, IR hot end inspection, MiniLab for statistical sampling inspection, as well as a number of sensors, like plunger sensors or temperature sensors for moulds and plungers. "Using these elements and sensors, we can offer closed loop automation technologies, which are key for the performance of glass manufacture. And in the inspection business, we are the only one who offers an all-in-one inspection machine, Flexinspect T."

Service and support have become increasingly important in recent years, as have improved electronic controls. "Servo controls are key for the latest developments towards greater automation, ensuring a safer and more consistent production process and delivering improved profitability and flexibility."

ORIGINS

Bucher Emhart Glass traces its roots to the late 19th Century, when three US entrepreneurs teamed up to find an alternative way of making and using glass containers. The company built its success on the individual section (IS) method of glass container forming, which ultimately became the worldwide industry standard.

BEG's founders first began working together in 1880 but the company dates its formal creation to 1912, when the Hartford-Fairmont Co was founded. It later became Emhart Corp, then Emhart Glass and finally Bucher Emhart Glass, celebrating its centenary in 2012. The firm's principal founders were all engineers, Karl E Peiler, William H Honiss and William A Lorenz all hailing from Hartford, Connecticut. They established the business when Karl Peiler's pioneering experiments to find a new way of forming glass containers showed promising results. Because the glass container industry was still to be fully automated, the potential was enormous.

According to current President Martin Jetter, Bucher Emhart Glass owes its success to many talented and dedicated individuals at every level of the business. "While its senior managers have often been reluctant to take credit for achievements that every team member contributed to, a few names stand out" he contends.

Karl E Peiler, for example, developed the technology on which the fortunes of Bucher Emhart Glass were based. Working from a basic laboratory, he invented the paddle gob feeder, paving the way for the efficient automation of glass container forming. And in 1920, Henry W Ingle created the groundbreaking IS glass forming process that made the company a world leader and is still the industry standard, almost 100 years after its invention.

Mike Cornaz was key to Emhart's expansion outside the USA since the 1960s, establishing its European base and later, Far East sales and service operations. He held a number of senior roles, including becoming the company's first European President.

Ray DeVita, who preceded Mr Cornaz as President, oversaw the crucial acquisition of the specialist Powers Manufacturing inspection business, consolidated manufacturing and guided the firm through its acquisition by Black & Decker. Bud Powers, the visionary founder of Powers, was another important figure.

More recently, Kurt Siegenthaler directed the development of the company's NIS servo technology, sowing the seeds of today's product lines, while current President, Martin Jetter has expanded the business in Asia and in particular, in China.

GROWTH MANAGEMENT

Within the past decade, sales have doubled via a matching combination of organic growth and acquisition. "Organic growth has been leveraged through the development of leading technologies like servo technology, quadruple gob machines and >

The Bucher Emhart Glass research centre at Windsor, Connecticut.

Bucher Emhart Glass AIS machine at Gürallar, Turkey.

automation functions, as well as by the completion of a very attractive product portfolio, which covers all market segments" Martin Jetter confirms. "In addition, a portfolio of attractive service products is now available."

Similarly, recent acquisitions have included ICS/Inex, which strengthened the BEG inspection business, a machine manufacturing company in Malaysia, which optimised the company's presence in Asia and expanded its manufacturing footprint, as well as Sanjin, the market leader in China, which improved access to the important Chinese market.

Since 1998, the company has been part of the Bucher Industries Group, a 200 years old Swiss industrial conglomerate with a strong financial standing. The Bucher strategy is to focus on long-term global and healthy growth, an approach that gives BEG an ideal financial and strategic platform to develop further. Despite its already strong position in a mature market, the company is confident of realising further growth in the coming years by expanding its product portfolio and introducing innovative automation functions. These will further increase productivity levels and improve the position of glass versus alternative packaging materials.

With a total workforce of 1864 people, Bucher Emhart Glass is led by an experienced management team, including Martin Jetter (President), Werner Gessner (Vice President Sales and Marketing), Reto Semadeni (Vice President Finance), Ed Munz (Vice President L&M), Mike Curry (Vice President Inspection) and Matthias Kümmerle (Vice President Technology).

As well as the company's headquarters in Switzerland, BEG maintains a network of international operations to serve the global glass container industry. In Europe, this includes facilities in Savona (Italy), Neuss (Germany), Oerebro and Sundsvall (both Sweden), while Asia is covered via subsidiaries in Johor Bahru (Malaysia), Singapore, Kawasaki (Japan) and Zibo (China). Interests in the USA can be found at Elmira (New York), Windsor (Connecticut), Perrysburg (Ohio), Owensville (Missouri) and St Petersburg (Florida). Of these 14 different locations, products are manufactured at six sites (Oerebro, Sundsvall, Johor Bahru, Zibo, Elmira and Owensville).

Sales are co-ordinated in three geographical regions, namely EMEA (Europe, Middle East and Africa), the Americas and Asia. All three have dedicated regional sales and service teams but are managed and co-ordinated from head office in Switzerland. So too are the company's international production facilities.

According to Werner Gessner, while Europe continues to represent one of BEG's strongest markets, an important upturn has also been realised in Latin America in recent years. The importance of both markets is illustrated by the company's recent completion of major projects for Vidroporto and Gürallar in Brazil and Turkey respectively. "In both cases, a strong relationship has been established with the customer, based on reliability, responsiveness, honesty and trust, together with technology and high efficiency" Mr Gessner comments. "With every customer, any issues that arise are addressed with attention, reliability and persistence. In addition, our global organisation allows us to bring people and services as close to the customer as possible to enable communication."

It was in 2013 that a game changing strategic alliance was signed with Owens-Illinois to supply forming equipment and parts for the glassmaker's factories around the world. In addition to generating additional business, the deal is understood to have expanded technical horizons. "On the other hand, we are very careful and sensitive that this relationship does not negatively impact other customers" Martin Jetter explains. "They still receive the same attention and the same resources."

DIVERSE PORTFOLIO

The Bucher Emhart Glass forming equipment portfolio includes a comprehensive series of pneumatic (arcuate mould open and close) IS machines in various configurations. Additionally, the company offers a pneumatic machine with parallel mould open and closing – the AIS machine.

In recent years, the portfolio has been expanded with two servo-controlled machines – NIS and BIS – both with parallel mould open and close.

Ware handling solutions available include pushers, conveyors, cross conveyors, ware transfers, stackers etc, while the FlexIS range of forming controls is offered, as well as a series of process products to monitor the forming process such as Temperature Control System TCS, Plunger Process Control PPC, FlexRadar etc. These sensors, together with the forming controls, allow for closed loop operations, thus automating the processes.

Separately, a range of forehearth and feeder refractory expendables is available, including both substructure and superstructure parts, spouts, tubes, plungers and orifice rings etc.

Currently, the AIS machine (parallel MOC) is the company's best selling forming equipment, followed by the NIS machine, which Werner Gessner explains is the first choice for QG beer and TG wine production. "However, the BIS, the 'smaller brother' of the NIS, sets new benchmarks regarding flexibility, safety and speed, as well as ongoing developments in the field of automation."

Turning to the Bucher Emhart Glass inspection portfolio, an extensive range of equipment has achieved widespread market success in recent years, including two rotary indexing stop rotate mechanical machines, namely FleXinspect T and FleXinspect M models.

Both mechanical machines perform a series of mechanical inspections, such as modulated check detection etc. Additionally, they both offer a number of vision inspections, such as vision plug/dip/ring. While the FleXinspect T is the only all-in-one machine in the market, its smaller brother, the FleXinspect M is the perfect drop-in replacement for many of the well-known mechanical inspection machines from the past, without requiring major changes to production lines.

Three vision machines are available (FleXinspect BC, FleXinspect B and FleXinspect C), which undertake many inspections, including sealing surface, base, six views opaque sidewall and w/3-dimensional, without touching the container.

Werner Gessner confirms that the FleXinspect T model represents the company's most successful

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inspection equipment model, emphasising that BEG's latest inspection technologies are setting the benchmark for user-friendliness, ease of set-up and inspection features.

AFTER SALES SERVICE

"After sales service is key for success in the market", Werner Gessner contends. "Customers expect a wide range of services and support and BEG has developed a whole set of after sales products, from training to process support and technical assistance which will be released in the coming weeks."

BEG is constantly increasing resources for service and production support in order to help customers to increase and maintain line efficiency. As a leader in the glass container market, the company also aims to be the leader in after sales services in the industry.

PARTNERSHIPS

As well as working closely with customers, Bucher Emhart Glass maintains positive relationships with other leading technology suppliers. The company was a founder member of the Container Glass Alliance in 2010, for example, in partnership with HORN, MSK and ZIPPE. "This alliance has provided great benefits for all members as the four companies are complementary and not competitive" Martin Jetter explains. "We have been able to leverage on several small and large projects by joining forces, including those for Nampak in South Africa and Vidroporto in Brazil".

Separately, an OEM agreement was signed with XPAR Vision last year, under the terms of which Bucher Emhart Glass plans to launch its BlankRadar device, based on two of XPAR Vision's products, the Gob Assist (GA) and the Blank Temperature Control (BTC). "BEG is expanding its sensor portfolio further with the intention to combine it with the FleXIS controls and increasingly to close loops to increase productivity in glass forming" Mr Jetter comments. "We do not need to re-invent the wheel. XPAR's Gob Assist system is a good sensor to monitor gob loading, it fits our purpose, so co-operation has benefits for both companies."

And in China, a joint venture was signed with Shandong Sanjin Glass Machinery Co in 2011, in an effort to develop a stronger position in the local market. "The Chinese market can only be acquired through a local player, as imported machines are usually far too expensive and often over-engineered for local requirements" Martin Jetter explains. "With its very high market share in China, Sanjin is the best possible fit for BEG to penetrate the Chinese market. The knowhow transfer from BEG to Sanjin, the investment in modern CNC machines and extra quality systems help to further strengthen the market position of Sanjin against local competitors."

Bucher Emhart Glass FleXinspect BC and T have been installed at Vidroporto in Brazil.

INNOVATIVE FOCUS

From its origins more than 100 years ago as the inventor of IS glass forming technology, the success achieved by Bucher Emhart Glass has been based on innovation and today, the company continues to search out ideas that will shape the future of the entire glass container industry. "We aim for innovations that will help our customers thrive in today's commercial and economic environment" says Martin Jetter. "That means helping them to improve operator safety, automation, process control, productivity and flexibility. As partners to an industry where environmental concerns are paramount, we also focus on areas such as energy economy, lower cost of ownership and reducing container weight to save material, transport and energy."

The forming R&D team spans six locations across three continents, from Sweden, Italy and Switzerland to the USA and Malaysia. Engineers are focused on four key areas: Automation, productivity, safety and flexibility. In automation, the aim is to make the glass forming process more stable and repeatable and less dependent on the skills of expert operators. Results of these efforts include closed-loop controls for plunger-up motion and blank cooling, which use machine readings to optimise production automatically in real-time and the FlexRadar hot end inspection system.

"Productivity is about making the manufacturing process faster and more efficient, to unlock improvements and savings for glass plants" says Martin Jetter. "Also, innovations in flexibility help producers switch between different containers more quickly, or produce different types of container at the same time. The recently introduced BIS machine is a prime example of a flexible machine, ideally suited to today's market."

Not only for the forming process but also for the inspection process, BEG invests into research and development and offers a great depth of inspection experience. "Our inspection research facility in St Petersburg houses a dedicated team of engineers, specialising in mechanical design, software development, optics and application engineering for glass container inspection" says Martin Jetter. "Current priorities include expanding the capability of our modular FleXinspect technology, radically simplifying user interfaces and closed-loop control."

At the research centre in Windsor, Connecticut, a team of over 50 people from all over the world works to improve existing products and develop new ones. The state-of-the-art facility includes a complete production line for forming and inspecting glass containers, allowing engineers to test the latest ideas in real-world conditions, gather detailed production data and develop valuable time-saving solutions, such as software for automatic multi-gob weight setup. Customers can also visit the research centre for help with specific issues around quality, efficiency, speed, flexibility, safety and energy savings. ■

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