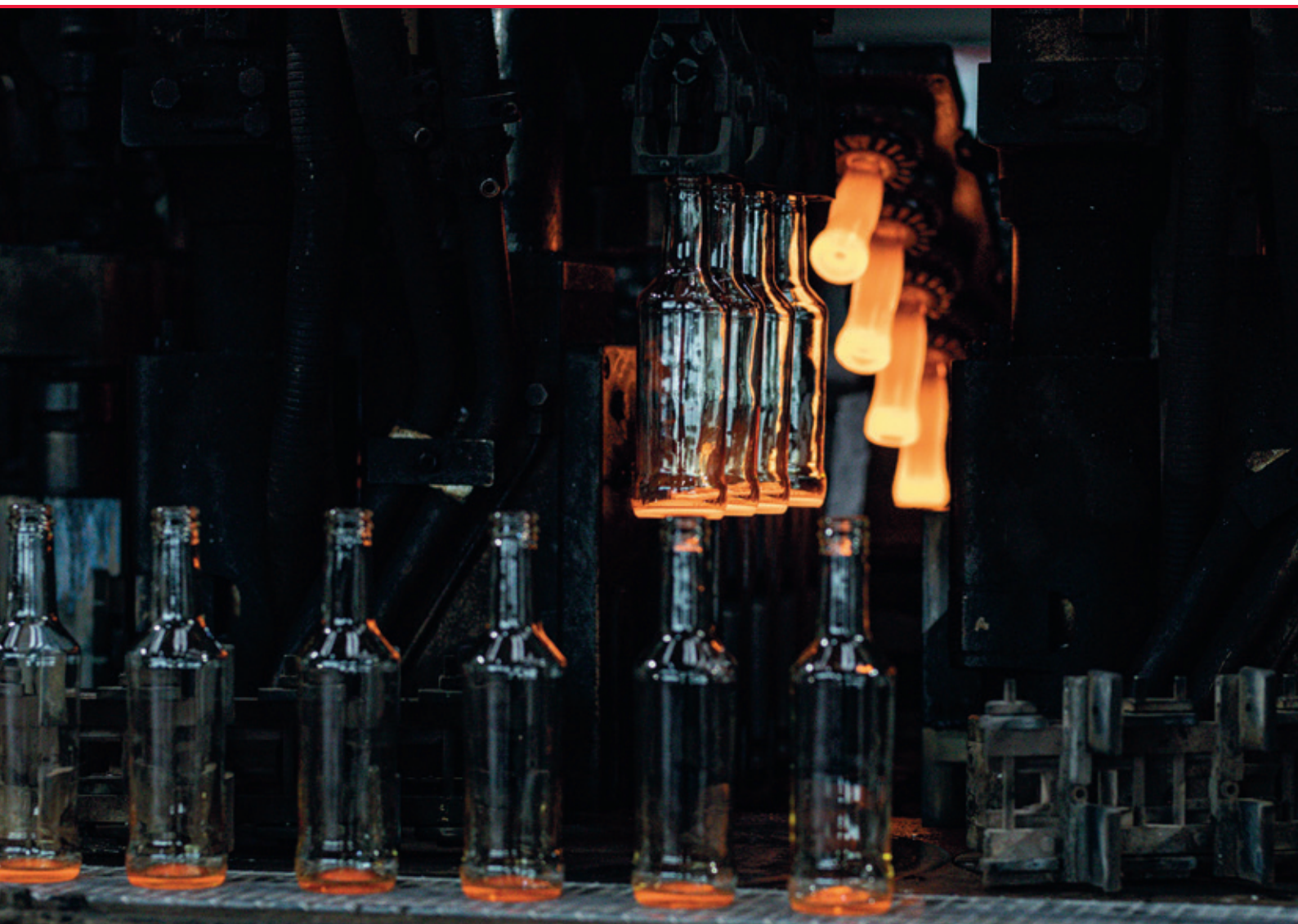


Company Overview



Bucher Emhart Glass has a proud heritage lasting for more than a century. Since creating the industry-standard IS machine, we have delivered leading innovations in gob and container forming, automation, control and inspection. We serve customers worldwide with responsiveness and understanding, while investing in R&D to achieve new milestones in production speed, product quality, testing precision and container strength.

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Welcome to Bucher Emhart Glass

Since introducing our 'End to End' vision we have successfully made the glass industry safer and more efficient. Our customers now produce more while using fewer resources. Glassmaking automation processes have improved thanks to our devices, methods, controls, performance, and expertise. The industry still has many obstacles to overcome, and we are working relentlessly to develop more technologies and procedures that allow our customers to tackle these issues.

In addition to growing quality requirements, sustainability, and loss of know-how and skilled labor, the main challenges include low efficiency, higher demand for flexibility, higher safety levels, rising costs and increased competition.

We have been making significant progress on this mission. Read on to learn more about how we are shaping the future of the industry through our five pillars: Equipment, Automation, Care, Empower and Academy.

These pillars are divided into two sections: technology and support. Using this approach, we can address all the problems faced by glass manufacturers and help keep the industry competitive.

Together, we can make it happen.



Matthias Kümmerle
President

End to End

End to End is a unique set of solutions, products and services designed to make glass production easier, safer and more efficient. It addresses all the challenges of glassmakers and helps to keep the glass industry attractive.

Uniting glass forming and inspection

There is no need to keep the hot end and cold end container glass processes apart. Glassmakers can resort to a range of technologies and processes that help them to read, analyze and react to the information, reducing costs and improving production efficiency.

Forming data parameters are matched with inspection results, enabling a self-learning process for the optimal forming process settings to achieve highest plant performance.

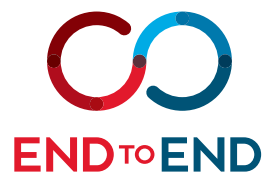
Products are traceable throughout the whole process. Employees are safer and more productive. And plant operations run at peak efficiency to achieve optimum productivity, resulting in increased profitability.

One plant, one partner

For the best return on investment, it pays to work closely with a single supplier who has an unrivalled knowledge of forming and inspection. The Emhart point of difference is that we are the only company to offer world-class machinery for both processes.

By integrating these technologies, we can provide more sensors at the machine, more automation, more closed loops and more data. Emhart customers can look forward to better ways of working, with improved safety, traceability and reliability, in an environment where a 1% increase in efficiency can result in tremendous earnings. Ultimately helping glass plants to run as profitably as possible.





End to End is split into five key areas, supporting the whole glassmaking process:

Technology

Equipment: Bucher Emhart Glass is world-renowned due to the cutting-edge equipment it manufactures. This includes control systems, container inspection, traceability and glass forming equipment. We enhance efficiency through the technology we provide and the set-up that enables it to perform at its best.

Automation: The shortest way to improve performance, dependability and return on investment is by investing in automation. Smart technology allows you to measure process information, analyze the data and react automatically in case of process deviation.

Support

Care: Care is what keeps your machines running; project management, original parts, services, maintenance and repair. When you need a part for your Emhart machine, it makes sense to choose a part from Emhart, because our service and repair teams know the equipment better than anyone.

Empower: With a bespoke approach tailored to your specific needs, our team will guide you on how to get the most out of your production.

Academy: There is a severe lack of personnel in our industry. Emhart aims to prepare a new generation of glassmakers through its academy. We pledge to teach everything we know, securing the future of the glass industry.

Equipment

We are the world leader in forming and inspection machines and hardware. Our technology analyzes data from both the hot end forming and cold end inspection processes, as well as from traceability equipment.





Forming

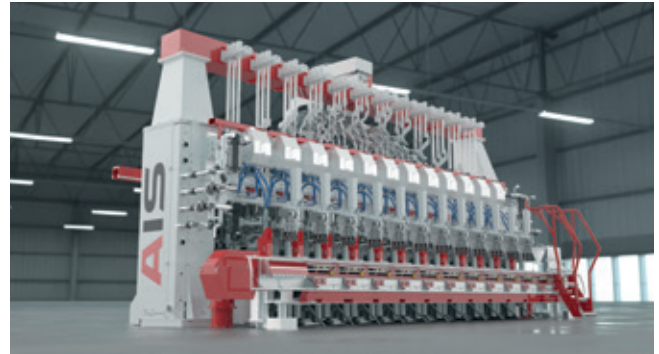


Gob forming

Bucher Emhart Glass has perfected the process of gob forming to turn streams of molten glass into the shapes that will be molded into the finished container. Our complete product line includes feeders that offer wide operating ranges for simplified operation. Feeder deflectors are designed to ensure uniform, consistent and repeatable gob guidance and delivery. Delivery and support systems provide precise alignment for smooth and centered gob transition into the mold which is essential for high ware quality. The spout system consists of an entire set of spout refractory components specially designed to promote optimum gob forming conditions.

Our range of equipment includes:

- Servo Feeder Systems
- Shears
- Feeders and Plungers
- Tube Mechanisms



Container forming

For producers of glass containers, the competitive situation today means that the highest quality machinery with maximum productivity and minimum downtime is a pre-requisite for success. As ecological awareness in consumers grows, the industry has to respond with lighter and stronger products.

With our large range of machine types and tradition of heavy investment in automation and controls, Bucher Emhart Glass is the perfect partner for success. We continue to invest in cooling technologies, parison forming technologies, delivery systems and new forming processes. All ensuring we lead the market in helping customers to produce the highest quality containers, at the lowest cost.

NIS: The NIS machine performs better than traditional IS machines through improved motion control, excellent repeatability and faster set-up time.

AIS: A mix of parallel Mold Open and Close (MOC) mechanisms, pneumatic operation, high-efficiency VertiFlow cooling and built-in versatility make the AIS machine unparalleled.

IS: The traditional pneumatic IS machine portfolio consists of three machine sizes: 4 1/4", 5 1/2" and 6 1/4". Each machine is available with different cavities and covers a wide ware range.

Discover more about
Forming Equipment
by Emhart





Process products

It is clearly understood that one of the key factors for improving pack-to-melt and container quality is the kinematics of the IS machine, which must be reliable, mechanically precise and fully controlled. However, the stability of the forming process itself becomes ever more vital for excellent quality and superior performance, which results in reduced container costs. The high variations and fluctuations can now be managed with the Bucher Emhart Glass Process product line.

GobRadar: Monitors each gob after the shear cut and records parameters such as weight, temperature, trajectory, length and diameter.

BlankRadar: A gob loading and temperature measurement system that is installed in the blank panel of the forming machine.

FlexRadar: A glass forming process analyzer using high resolution infrared technology. It identifies real-time glass forming process deviations and quality issues.

Plunger Process Control (PPC): This control system monitors individual plunger motions during the parison forming process.

FlexPressure System (FPS): Optimizes and programs the pneumatic process functions of the forming machine.

Temperature Control System (TCS): Mounted on a rail in the blank side panel, the pyrometer measures the temperature of individual blanks, blank vertical profiles, plunger and neck rings.

Multi Gob Weight: Allows producers to make individual section changes to the feeder parameters.



Ware handling

Hot end ware handling ensures the stable transport of hot and fragile containers from the forming machine into the lehr. This is the part of the production process where good ware can not only be lost or damaged, but the speed and efficiency of the entire production line can also be limited.

Servo Electric Take Out (SETO): Picks up containers from the blow mold and moves them over the dead plate for cooling, before releasing the container.

FlexPusher: This mechanism transfers the containers from the dead plate onto the running conveyor. It combines the motion of two independent servo motors to generate the sweep out motion.

FlexConveyor: The new steel conveyor is suited to different customer needs. It improves stiffness, reduces the reach difference, optimizes the wind box for equal flow with an option for two on/off controls, integrates the pusher cables and provides a height-adjustable dead plate.

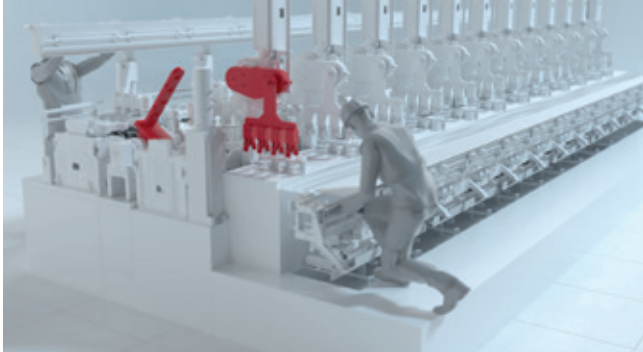
WareTransfer: This moves containers from the machine conveyor to the Cross Conveyor. The transfer wheel has to cope with spacing variations and still transfer the containers with consistent spacing onto the Cross Conveyor.

Cross Conveyor: A unique cast iron girder reduces the vibrations and minimizes distortion due to the hot environment. It reduces installation service requirements (fluid cooling) and guarantees a long equipment life.

FlexStacker: The three axis FlexStacker uses the FlexIS control hardware from the IS machine. Enabling the introduction of a pioneering human interface with built-in expert knowledge, it allows easy set-up of the new stacker without the need for specialists.

Ware Handling Supervision (WHS): Fully integrated in the FlexIS timing, it rejects incorrectly positioned containers at the Hot End. The unit uses a light barrier to detect cullet and stuck or down ware on the conveyor belt.

Forming



Safety features

Safety is of critical importance in a glass plant. That is why Bucher Emhart Glass puts safety at the heart of everything, with a range of built-in and additional safety features available.

Manual Mode: The latest safety level for machine operation, Manual Mode gives the operator a simple and safe method for changing mold equipment.

Blank Side Overhead Panel: The Blank Side Overhead Panel is designed to provide an ergonomic operator interface to the section controls.

Blank side Barrier (BsB): The BsB is a valuable safety addition to the Bucher Emhart Glass container forming machines.

Gob Distributor Guard: The guard is designed to inform and hinder access to the dangerous zone. It is lightweight and can be easily removed. The fasteners are attached to the guard.

Override Switch Protection: The U-shaped channel minimizes the risk of unintentionally activating the override switches. Available as standard on the Bucher Emhart Glass pneumatic valve block, it can be retrofitted on the 26 I EPVB.

Safety Flaps: The EVPB valve block safety flaps alert the operator on the blank side about overriding mechanisms and risking the safety of an operator on the blow side. The safety flaps are available in different lengths for retrofit. On the standard Bucher Emhart Glass EPVB invert/revert, blowhead and blow molds are covered in safety flaps.

Blowhead & Blow Mold Interlock: Gives the operator on the blow side control of the blowhead and blow molds. The switches lock the mechanisms in the up and open position and indicate the status of the mechanisms very clearly.

Controls

Bucher Emhart Glass has a range of pioneering and trusted control systems for managing the different types of IS machines.

FlexIS Controls: The core component that makes automation possible. Much more than a forming control tool, FlexIS is conceived as a full process control system capable of directing all of the various events and actions required to produce high-quality glass containers.

User Interface UC2: The UC2 uses the cutting-edge Server-Client architecture, enabling operation on multiple clients. It is a versatile, powerful and user-friendly touch-screen interface.

Defect Animation Tool: Using the Defect Animation Tool (DAT), the operator can identify what is causing defects and make the best decision to resolve them.

Cabinets and Controls: FlexIS 3 is accommodated in two different cabinet types: one for the machine controller and ware handling controller, and one for the section controller.

Standalone Controls: Standalone systems are controlled via an LCD touch screen with function keys. The connectivity happens through an ethernet interface.

Inspection



Inline inspection

Emhart's inspection solutions verify container quality and integrity in the most demanding environments, combining vision inspection, software, lighting and reject systems for optimum system performance.

FleXinspect T: Provides unmatched modular versatility, value and flexibility for glassmakers' current and future requirements.

FleXinspect T¹⁸⁰: Designed to be installed at the end of inspection loop conveyors, allowing glass plants to utilize space without additional expensive layout modifications.

FleXinspect M: A servo-indexing, rotary inspection system created to be a perfect replacement for many old mechanical machines.

FleXinspect B Generation III: A reliable and configurable platform that easily allows inspection functionality to be added as required.

FleXinspect C Generation III: A sidewall inspection machine with 6 IntelliLED (programmable LED) light sources and HD cameras.

FleXinspect BC Generation III: A uniquely configurable platform that combines the features of the FleXinspect B Generation III and FleXinspect C Generation III into one machine.

FleXinspect F Generation III: A mobile finish inspection machine.



Peripheral inspection

HST High-Speed Squeeze Tester: A high-speed squeeze testing device.

TID Thread Inspection Device: A standalone thread inspection device for the highest level of accuracy.

DIM Dimensional Inspection: A stand-alone dimensional inspection device for an extra-thorough inspection.

ATI Article Type Identifier: A line scan inspection and container categorization and rotation device.

Peripheral handling

CS2 container separator: A twin belt container separator with two servo motors.

CS4 High-speed container separator: A high-speed container separator with four belts and servo motors.

WAP: A container separator and distribution system typically used for multi-article production.

AL container alignment: A standalone container alignment device.

IQM infeed control: An infeed protection control that rejects unsatisfactory ware before it enters the machine.

Discover more about
Inspection Equipment
by Emhart



Inspection



Statistical sampling

Bucher Emhart Glass statistical sampling machines are designed to frequently measure a variety of critical glass container dimensions. They give glassmakers valuable feedback about the quality of the production and advance warning of any drift in the forming process.

These machines provide valuable product quality information where the bottlemaker can take immediate action, thus significantly reducing the response time to possible anomalies. Furthermore, by reducing the feedback time to the hot end operator, they are very effective tools in bringing the forming process to target pack-to-melt and shortening the actual job change time.

These statistical sampling solutions ensure adherence to critical quality criteria and reduce plant labor via automation, while improving measurement accuracy and repeatability.

MiniLab: MiniLab is a complete turnkey solution. Its flexible and scalable design lets glass manufacturers integrate multiple devices to serve specific quality control requirements.

MiniLab P: MiniLab P calculates the maximum amount of internal pressure a container can withstand.

MiniLab D: Using high-resolution cameras and application-specific optics, MiniLab D calculates the dimensional aspects of glass containers.

MiniLab Wall Thickness Gauge: The Wall Thickness Gauge uses a single non-contact chromatic sensor to estimate the wall thickness of glass containers.

Traceability



Traceability

Total traceability in the production process means the possibility to attach all production information and inspection results to an individual glass container.

ID Mark: The ID Mark laser marking system is the universal tool to mark human-readable information, data matrix codes or combinations of both on hot glass bottles.

ID Read: The ID Read allows Bucher Emhart Glass machines to read the data matrix code laser marked on the bottle by the ID Mark.

Discover more about
Traceability Equipment
by Emhart





Automation

Through our End to End vision, we revolutionized glassmaking by creating a set of solutions and automation technologies to make glass production easier, more efficient and safer – uniting the hot end and cold end in ways not previously possible.

Closed loops

By providing automatic adjustment, the closed loop products help achieve reduced production limits and faster start-up times after job changes.

Plunger Up Control: Automatically adjusts the plunger up motion in Press & Blow productions.

Blank Cooling Control: Automatically adjusts the cooling of the blank mold halves to maintain the desired temperature.

Plunger Cooling Control: Automatically adjusts the cooling of the plungers to maintain the desired temperature.

Bottle Spacing Control: Automatically modifies the placement of the containers on the conveyor so that an equally distanced ware sequence is maintained.

SMARTFEEDER: Allows you to define parameters for your desired gob design. The Gob Control Closed Loop then adjusts any deviations per cavity and for multi-article production.

Control Center

The Control Center is the data hub of the forming line. It collects and analyzes the data from smart sensors, forming and inspection machines.

Robots

To increase glass plant profitability, Bucher Emhart Glass provides integrated FlexRobots as part of our automation solution portfolio. The robots are able to swab the blank molds and neck rings automatically.

Discover more about
Automation by Emhart





Care

Care is what keeps your machines running; original parts, service and repair. When you need a part for your Emhart machine, it makes sense to choose a part from Emhart, because our service and repair teams know the equipment better than anyone.



On-site service

Our global, multilingual team of over 60 professional service engineers specializes in forming and inspection.

Project management

Bucher Emhart Glass can manage the development of a new glass container manufacturing facility, from initial concept to the final commissioning.

Maintenance support

The scope of this service includes equipment maintenance and condition monitoring. Emhart offers complete Technical Service Agreements for inspection equipment.

- **Health Check / Repair Proposal**
We perform an in-depth on-site audit of a forming line to get a detailed overview of the equipment's technical condition.
- **Repair and Upgrade Project**
Professional repairs performed by qualified service engineers, and equipment upgrade with original parts, including Project Management.
- **Health Check**
Analysis of current Hot End maintenance operations, including detailed audit report.
- **Periodic Maintenance Review**
We assist our customers in closing the gaps pinpointed in the Health Check with an iterative maintenance model, including quarterly visits by experienced Bucher Emhart Glass Service Engineer & Production Specialists.
- **Technical Service Agreement**
Periodical health checks, preventive maintenance and minor repairs to ensure optimum equipment performance.

Original parts

Bucher Emhart Glass maintains a portfolio of 150,000 parts for hot end equipment and inspection machines. Compared with maintaining a supply at the plant level, this central stock allows for significant cost reduction.

Remote service

Remote service gives our customers ready access via secure internet to experienced experts in equipment operation, troubleshooting, and maintenance. This assistance can decrease operation costs, downtime and lost production by supplying immediate help.

Repairs

Bucher Emhart Glass can repair high-value items. Our customers can spend less on products and resources by fixing a used item instead of buying new ones.

Automation maintenance

The basic package ensures that closed loop solutions are working correctly, whereas the professional service guarantees excellent operating conditions for the closed loop solutions.

24/7 emergency assistance

Our 24/7 emergency assistance service offers phone support around the clock. When required, we dispatch a service engineer for urgent on-site services.

Discover more about
Care by Emhart



Empower

Empower is our support network. They say that knowledge is power – and we are here to empower you in the use of your technology.



Production support

Our production specialists support the start-up of your new forming machines and assist you with introducing new processes and technologies.

Mold and cavity design

Bucher Emhart Glass supports customers with mold & cavity modeling studies and on-site assistance to optimize current and new glass container production.

Trials

With a trial at our facility, you can benefit from uninterrupted and unlimited plant time, with no disruption to your own production time; as well as Bucher Emhart Glass know-how and the chance to try new forming, inspection and End to End technology.

Discover more about
Empower by Emhart





Academy

We have introduced new, formalized programs for the glass industry that will lead to increased knowledge and professionalism.



Forming equipment

Forming Equipment Training modules allow participants to operate Emhart equipment and provide comprehensive technical knowledge.

Inspection equipment

Inspection Equipment Training gives inspection operators and specialists advanced knowledge of inspection technology.

End to End products

With our End to End Products training, users can get the most out of our cutting-edge sensors, devices and applications.

Operational - equipment and processes

The Academy offers tailored operational courses to provide further insight into the complex operation of a glass container production line.





Training and Competency Centers

Training is provided at our three Training and Competency Centers:

- **Windsor (USA)**
The Windsor office is our worldwide product and process research and development center. The Emhart Glass Research Center houses research and development scientists and engineers, as well as a complete pilot production line dedicated to the automation and advancement of glass container production.
- **Sundsvall (Sweden)**
This facility is dedicated to producing solutions for the glass container industry, including gob forming and container forming. A group of mechanical engineers designs the container forming machines and feeders.
- **Munich (Germany)**
The Planegg facility near Munich provides engineering, training and manufacturing for the Flexinspect product line.

Besides Training in our Academy facilities, Emhart offers on-site training at our customers sites. Experienced personnel will bring their expertise to your plant. Additionally, eLearning modules are available for most of our products through the Bucher Emhart Glass eAcademy.

Discover more about
Academy by Emhart



Bucher Emhart Glass is the world's leading supplier of advanced technologies for manufacturing and inspecting glass containers.



Vision

Our vision is a world with glass as a dominant and preferred ecological packaging material, enabled by Bucher Emhart Glass as the leading solutions provider.

Mission

We enable the glass container industry to become more competitive and sustainable through technology and supporting our partners in achieving the highest performance.

Why partner with us

A century-long history of stability and professionalism makes Bucher Emhart Glass the ideal partner for glassmakers. Our belief in glass is unwavering. For our clients, and for us, it represents the basis for the future.





Who we are

Nearly 40% of the world's bottles are made using our machines. Our global presence – with more than 50 manufacturing locations and development sites on five continents – gives us the advantage of knowing the needs of our customers in different markets. Since 1807 we have been creating technologies that push the glass industry forward. We built the IS machine that is now the industry standard, and we continue to develop game-changing innovations in gob forming, container forming, automation, control and inspection.

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