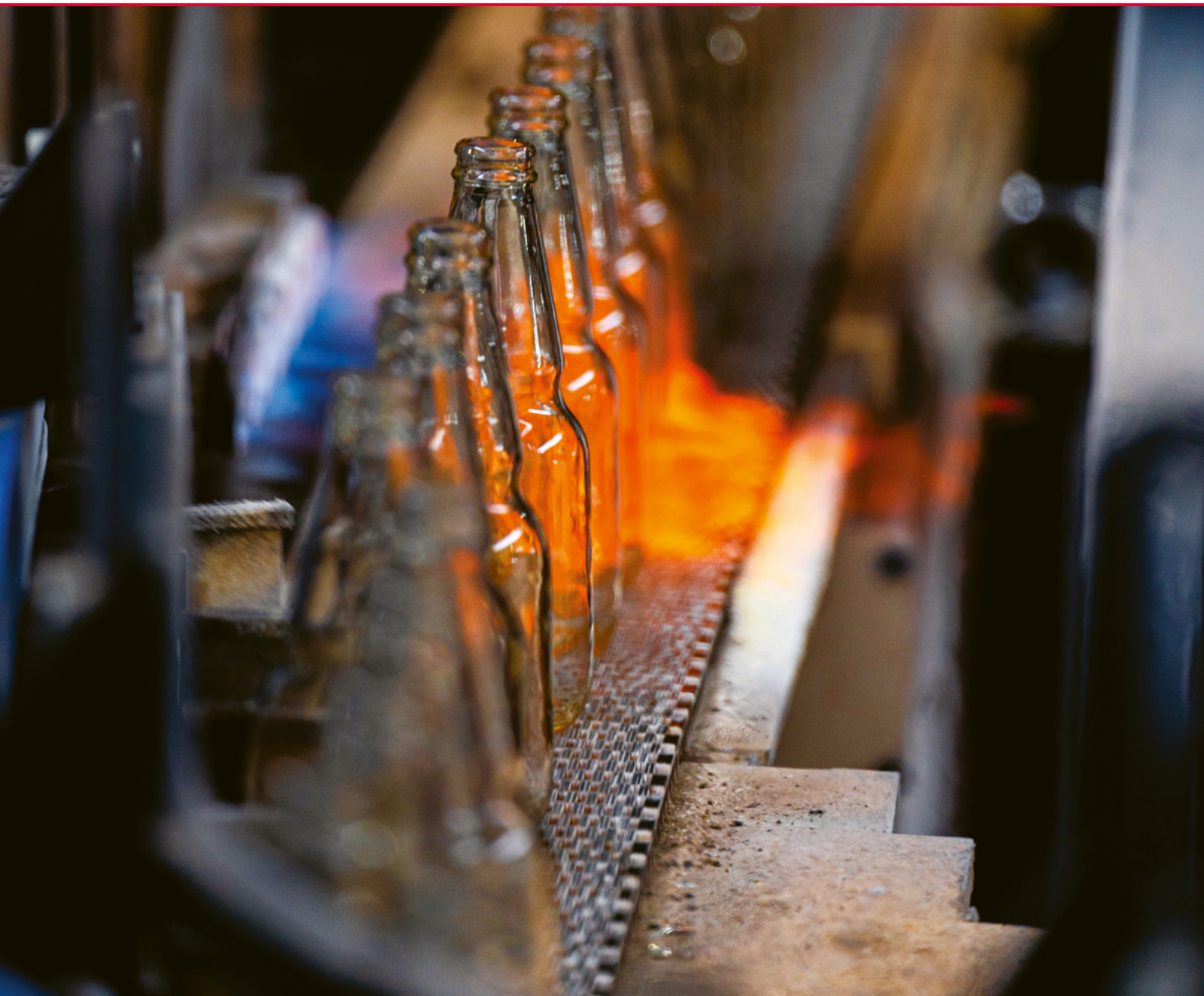
BUCHER
emhart glass

Technology Brochure



Contents

End to End

Bucher Emhart Glass has always enabled glassmakers to have the best performing glass plants.

In 2016, we transformed the industry with End to End, closing the loop between the hot end and cold end with a portfolio of industry-leading technology and services. End to End proposes a unique set of solutions, products and services designed to make glass production easier, safer and more efficient.

Uniting Glass Forming and Inspection

The glass plant of the future will have production processes that will amaze the glassmakers of the past. Integrated equipment will document, analyze, and react to data automatically to ensure product quality and optimize operation. Products will be immediately traceable. Employees will work more safely and productively, while plant operations will run at peak efficiency, maximizing productivity and driving greater profitability.

One Plant, One Partner

For the best return on investment, it makes sense 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, we help glass plants to run as profitably as possible.

Technology

Forming Equipment

We enhance efficiency through the technology we provide, ensuring maximum productivity and minimum downtime. This includes controls, traceability and glass forming equipment. Our gob forming portfolio includes state-of-the art servo feeders and deflectors.

Automation and Data

Automation is the surest way to improve performance, reliability and ROI. Our smart technology lets you capture process information, analyze the data and react automatically.

Inspection Equipment

Our inspection devices detect features or defects that conventional inspection machines may miss, to significantly enhance your quality-control. The modular FleXinspect platform can be configured to incorporate additional inspections, improving efficiency and reducing costs.

Forming Equipment

Gob Forming

We have perfected the gob forming process, turning streams of molten glass into consistently superior gobs. Our product line includes everything from feeders, deflectors and spout systems, to the delivery and support systems. We provide everything you need to efficiently deliver dependably high ware quality.

Servo Feeder System

The Servo Feeder System offers improved production quality and customized gob forming. The system includes the Feeder Plunger, Tube Height and Rotation and the Shear Mechanism, as well as optional Metering Spout System. It's available as a standalone system, or as a fully integrated part of the FlexIS Process Control System.

570 Servo Feeder Plunger

Improved controls and gob shape monitoring, the 570 plunger mechanism benefits from a direct motor drive and mechanical spring plunger assist system.

570 Multi-Drive Feeder Plunger

Multi-Drive feeder enables control of individual feeder needles, to adjust each gob individually per cavity and compensate for glass inhomogeneity in the spout.

555 Tube Mechanism

Ensuring highly precise control over the volume, temperature, and shape of the glass gobs to significantly improve throughput while reducing material waste.

575 Dual Drive Shear

The latest generation of parallel shearing mechanisms developed for enhanced gob forming and higher performance, while delivering cutting speeds of 220 cuts per minute and above.

565 Servo Shear

Parallel shear motion and synchronized cutting forms consistent gob shape and weight and reduces shear marks. The system is simple to install and requires less maintenance, while increasing blade life and reducing shear spray.

SMARTFEEDER

The latest development to automatically adjust the gob forming process, SMARTFEEDER improves process stability, enables easier start-up after job change and facilitates multi-article production.

Single Line Shear Spray System

A modern replacement for the 502-301 single line shear spray unit, the system improves on the older model in convenience, performance and safety.

Discover more about Forming Equipment by Emhart.

Forming Equipment

Container Forming

For glass producers, maximum productivity and minimum downtime are non-negotiable. As ecological awareness grows, the industry must also deliver lighter, stronger products. We continue to invest in cooling technologies, parison forming technologies, delivery systems and new forming processes to ensure we lead in helping customers produce the highest quality containers, at the lowest financial and ecological 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 mean the AIS machine is unrivalled.

IS 5”

The 5” pneumatic IS machine delivers the highest flexibility in the IS range. From SG all the way to QG, the 5” machine covers the largest ware range with traditional pneumatic operation.

IS 4 1/4” – 5 1/2” – 6 1/4”

The pneumatic IS machine portfolio consists of three sizes, 4 1/4”, 5 1/2” and 6 1/4”, each available with different cavities covering a wide ware range.

535 Servo Gob Distributor

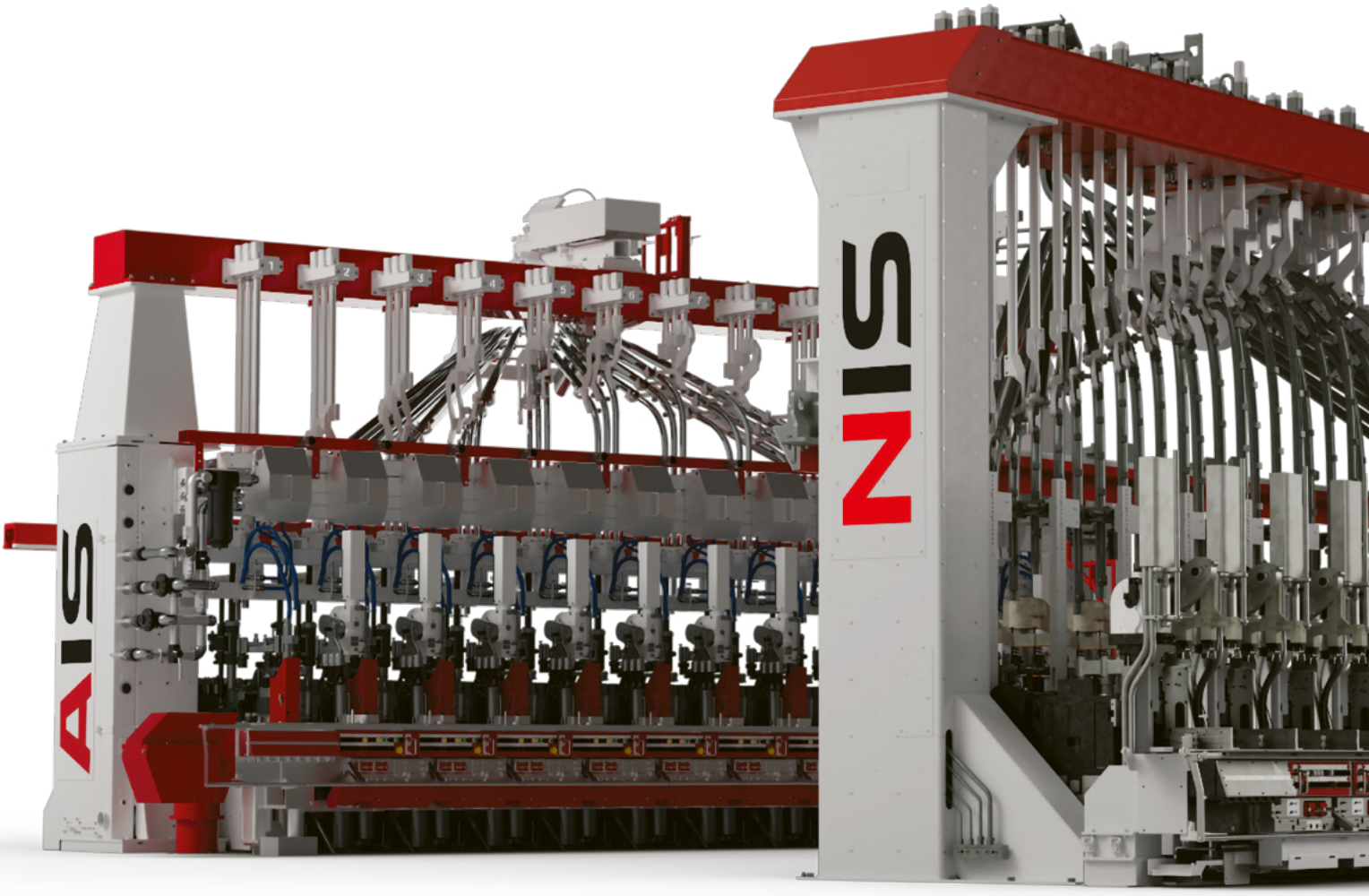
Covering a wide range of scoop, trough and deflector sizes to deliver gob weights from a few grams to over 1kg precisely into the section blank molds.

Cooling Products

Cooling leads to the stability of the container and defines production speed. Cooling capacity must be stable, high and make efficient use of energy. Final distribution is primarily set by the blank mold temperature profile and parison quality, meaning a predictable, adjustable, stable temperature grid is vital to achieve a high container quality.

Delivery

Constant Cone Bezier delivery is our glass development for optimal gob loading. It provides enhanced gob loading and covers the full range of forming machines (NIS, AIS and IS) for all available center distances.


AIS
SIN

Forming Equipment

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 be lost or damaged. It can also limit the speed and efficiency of the entire production line.

SETO

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.

Ware Handling Supervision

Rejects incorrectly positioned containers and cullet at the Hot End, ensuring they don't move forward in the production line.

FlexPusher

Transfers containers from the dead plate to the running conveyor, combining two independent servo motors to generate the sweep out motion.

FlexConveyor

The steel conveyor with height-adjustable dead plate improves stiffness, reduces reach difference and optimizes the wind box for equal flow. It also integrates pusher cables and comes with an option for two on/off controls.

Ware Transfer

Moves containers from the machine conveyor to the Cross Conveyor with consistent spacing, while taking into account spacing variations.

Cross Conveyor

Reduces vibrations and minimizes heat distortion. Also decreases fluid cooling installation requirements and guarantees longer equipment life.

FlexStacker 2

A pioneering human interface with expert knowledge built in, the FlexStacker 2 handles high-speed loading into the lehr, while being completely integrated into the FlexIS UI and control cabinet. Easy stacker setup without the need of control hardware specialists.


C1
FAN
MC
POWER SUPPLY
MC
DRIVES
MC
DRIVE
MC
DRIVE
MC
DRIVE
MC
DRIVE
Jetter
FRISTADS

Automation and Data

Without a doubt, the future of glass forming is digital. In the glass-container factory of the future, the forming process will be controlled and optimised automatically by digital technology, with little or no intervention from human operators.

Controls

Our comprehensive Control products are designed to optimize glass production processes, with their user-friendly interfaces ensuring flexible, remote and reliable control, boosting productivity, minimizing downtime and improving decision-making.

FlexIS Control System

FlexIS is a full process control system capable of directing everything that's required to produce high quality glass containers.

User Interface UC2

Versatile, powerful, state-of-the-art Server-Client architecture with user-friendly touch screen interface for simultaneous operation on multiple clients.

Cabinets and Controls

TS-E is housed in two different cabinet types for the machine controller, ware handling controller, and section controller which provides flexibility, easy configuration, remote accessibility, and reliable communication.

Standalone Controls

Allows integration of our servo mechanisms into existing machines not equipped with FlexIS. Works with some competitor timing systems.

FlexIS Line Server

The Lineserver 3 provides centralized functions like job preparation, production supervision and backup for all forming lines that are controlled by a FlexIS 2 or 3 control system.

Discover more about Automation and Data by Emhart.

Automation and Data

Data Products

Our technology analyzes data from both the hot end forming and cold end inspection processes, as well as from traceability equipment.

Control Center

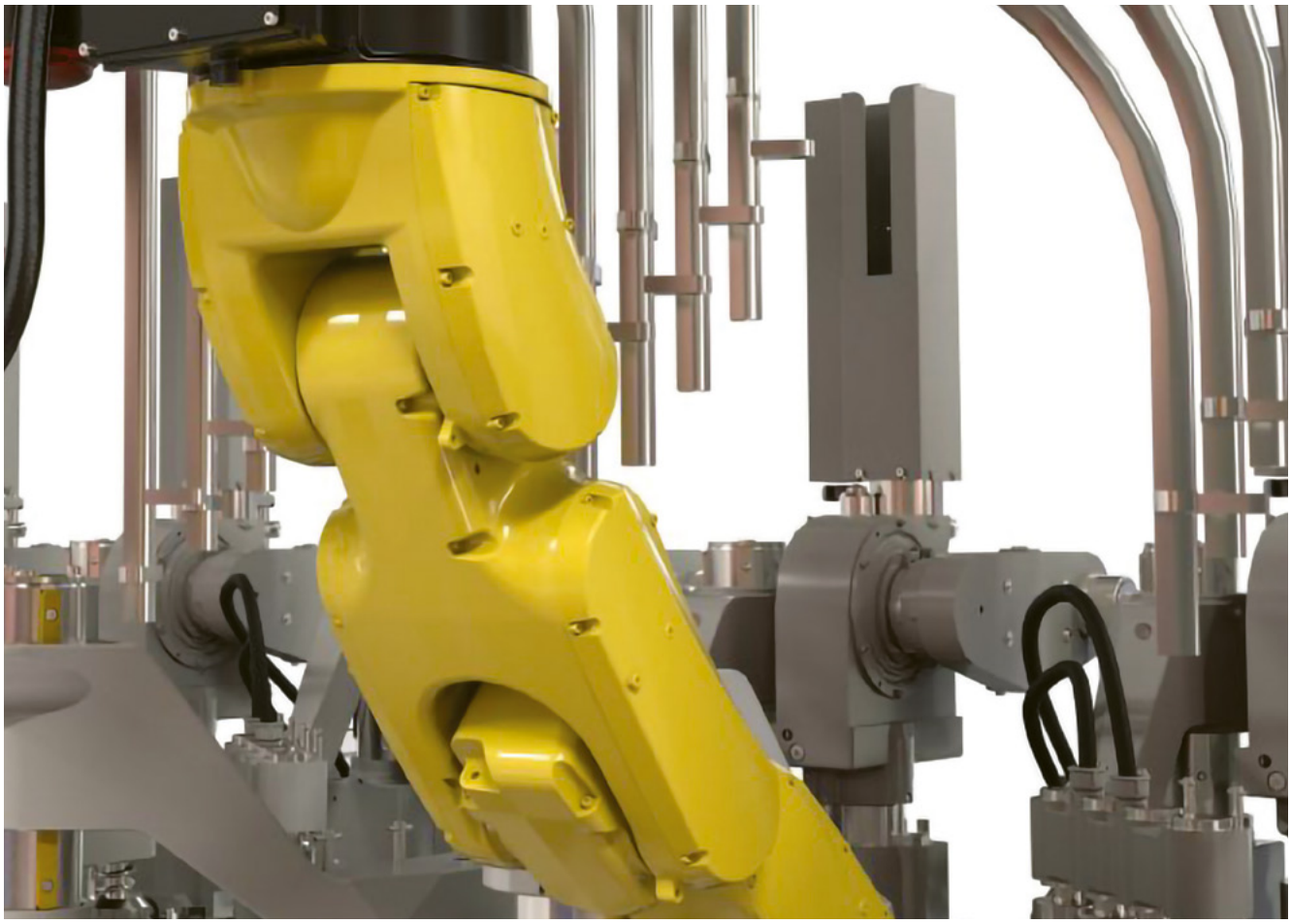
The data hub of the forming line. It collects and analyzes the data from smart sensors, forming and inspection machines.

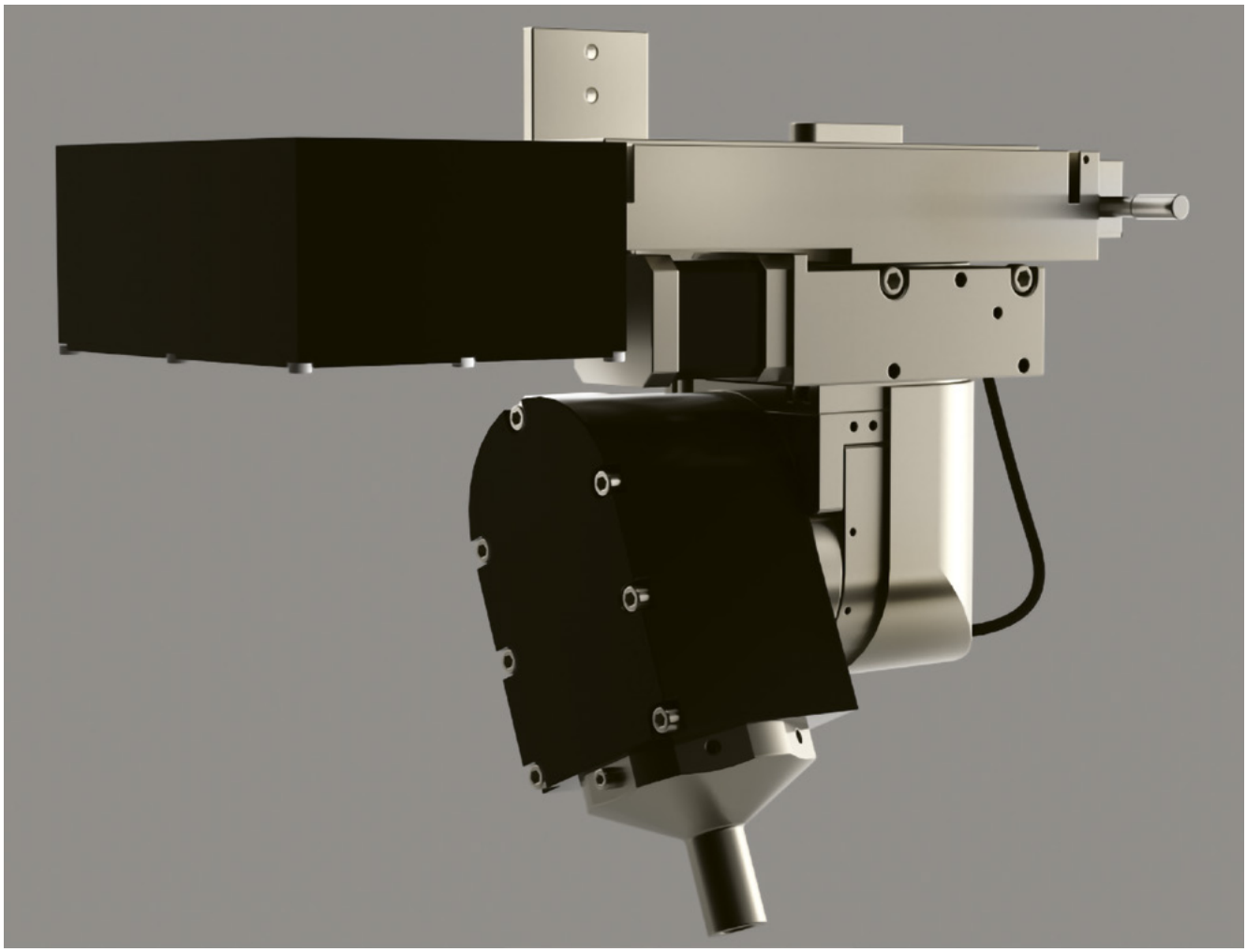
Defect Tool

Empowers the operator to identify the cause of defects and identify the best resolution.

FlexIS Lineserver

The Lineserver 3 provides centralized functions like job preparation, production supervision and backup for all forming lines that are controlled by a FlexIS 2 or 3 control system.





Automation and Data

Process Products and Robots

Variations and fluctuations can be managed with our Process Product line. The line focuses on monitoring, controlling, and optimizing key variables in the glass-forming process to ensure greater stability, precision, and quality. As part of that, we provide integrated blank and blow side robots which automatically swabs blank molds, blow molds, neck rings and bottom plates.

GobRadar

Monitors each gob after the shear cut and records weight, temperature, trajectory, length and diameter to improve stability and increase efficiency.

Plunger Process Control (PPC)

Monitors individual plunger motions during the parison forming process to automatically regulate gob weight, adjust tube height and control individual plunger needles.

FlexPressure System (FPS)

Optimizes and programs the pneumatic forming machine process functions for high air flow, automatic pressure control and faster response to pressure changes.

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.

FlexRadar

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

FlexRobot

The FlexRobot systems can be mounted on both the blank and the blow side and are integrated in the FlexIS control. The FlexRobot Blankside swabs the blank molds “on the fly” and the neck-rings in alternate cycle. The FlexRobot Blowside swabs the blow molds and bottom plate in coactivity with the blank side alternate cycle. Both systems deliver consistent swabbing that reduces the potential risk of accidents and increases the container output.

Automation and Data

Closed Loops

Integrated measurement systems provide valuable insight into the forming process. However, the machine operator is faced with an overwhelming level of information: finer adjustment possibilities, the number of cavities per machine and more frequent job changes. With automatic adjustment, closed loop products can achieve tighter production limits and faster start-up times after job changes.

SMARTFEEDER

The latest development to automatically adjust the gob forming process, SMARTFEEDER improves process stability, enables easier start-up after job change and facilitates multi-article production.

FlexIS Cooling Control

A bundle of closed loops maintains temperatures to automatically adjust the cooling in the forming machine. Reduces start-up time after job changes, stores settings and automatically adjusts the cooling of the blank molds, plungers and neck rings.

FlexIS Plunger Up Control

Adjusts the plunger up motion in Press and Blow productions. The system ensures that the cavity is filled entirely with glass at the desired time and thus prevents defects such as a wired edge and sugary finish.

FlexIS Bottle Spacing Control

Automatically adjusts the placement of the containers on the conveyor using information from the FlexRadar forming process monitor system to ensure even and consistent spacing.

Automation and Data

Traceability

Traceability is critical to product quality, meeting regulatory standards, and quickly identifying the root causes of defects and inconsistencies. Our marking systems and sensors monitor unique identification codes assigned to each individual product and collect data on production variables, to enable efficient defect detection and corrective action.

ID Mark

Marks human readable information, data matrix codes or combinations, on hot glass bottles to identify each bottle individually. Codes contain the time of manufacture, a line code and information about the originating cavity.

ID Read

Reads data matrix codes marked by the ID Mark, connecting hot end and cold end information, storing individual inspection results and verifying codes' machine readability for future use.

Inspection Equipment

To maintain the image of glass as a premium packaging material, containers must reach the highest standards of excellence. The success of the container inspection system is crucial in ensuring the consistent quality glass' reputation is built on.

Inline Inspection

We deliver the industry's most comprehensive selection of empty glass inspection solutions. From base, sidewall, finish and stress inspection to mold correlation and check detection for glass containers in all sizes, shapes, colors, and configurations. Our systems offer exceptional flexibility with quick product changeover, ease of operation, simple maintenance, and production analysis.

FleXinspect T – gen III

A total inspection solution: reliable, uniquely configurable and capable of providing all the necessary cold end inspections.

FleXinspect T180 – gen III

Reduces the number of machines required per inspection leg, increases throughput and reduces inspection loops.

FleXinspect M – gen III

Acts as a drop-in replacement for mechanical inspection machines, combining multiple inspections in a single machine frame.

FleXinspect B – gen III

Uniquely configurable platform allows easy integration of additional inspection functionality and fully automatic job changes.

FleXinspect C – gen III

Sidewall inspection machine with programmable LED light sources and high-resolution cameras for the highest available level of inspection.

FleXinspect F – gen III

Mobile finish inspection machine that carries out a number of internal and external checks to enhance product quality, safety, and consistency.

Master Track

Inspects and measures container quality, making data-driven decisions to remove defective containers, enhancing quality assurance and increased efficiency.

HEAT

Speeds up information exchange between the cold end and hot end, saving time and reducing ware loss. It can also identify trends and advise on process improvements.

Discover more about Inspection Equipment by Emhart.

FleXinspect T - Gen III

FleXinspect T180 - Gen III

FleXinspect M - Gen III

FleXinspect B - Gen III

FleXinspect C - Gen III

Inspection Equipment

Peripheral Inspection

Our systems use high-speed, automated technologies to ensure dimensions, surface integrity, and mechanical strength are thoroughly inspected and compliant with quality and safety requirements.

HST High-speed Squeeze Tester

Quick set-up, intuitive operator interface and long-lasting wheel design that is less prone to embedded glass fragments.

TID Thread Inspection Device

AI-driven non-contact thread inspection on round and non-round containers at speeds of up to 600CPM. Available as an integrated option on FleXinspect machines.

DIM Dimensional Inspection

Contactless measurement of diameters, height, lean, and bent necks at speeds up to 600CPM. Available as an integrated option on FleXinspect machines.

ATI Article Type Identifier

Sorts multiple container types on a single-line conveyor and identifies containers for downstream inspection. Operates at speeds up to 300CPM.

Peripheral Handling

Our products optimize production efficiency, reduce downtime, and maintain high product quality: managing the flow and organization of containers and ensuring they’re spaced, oriented, and defect-free before inspection or packaging.

CS2 Container Separator

Spaces round and non-round containers prior to inspection, this servo-driven system works stand-alone or integrated with FleXinspect.

CS4 High Speed Container Separator

Operates independently or integrated with FleXinspect, spacing round and non-round containers at speed before inspection.

CSmulti

Spaces article types with diverse diameters prior to inspection, including both round and non-round containers. Works stand-alone or integrated with FleXinspect.

AL Container Alignment

Combines with the Article type identifier or FleXinspect B to rotate containers in any orientation for optimal sidewall inspection or packaging.

IQM Infeed Quality Monitor

Automatically removes broken, fallen, stuck and over/under height containers to improve line efficiencies.

WAP Wave Pusher

Diverts upright containers to an alternate conveyor. It can be used for container rejection, sorting, and selection.


MiniLab P
MiniLab P

Inspection Equipment

Statistical Sampling

Providing measurement of critical container dimensions and giving valuable feedback about quality as well as advance warning of drift. These machines provide valuable information for immediate action, significantly reducing response times, bringing the forming process back to target pack-to-melt and shortening job change times.

MiniLab

A turnkey solution for statistical sampling, it ensures adherence to critical quality criteria and reduces plant labor while improving accuracy and repeatability.

MiniLab P

Measures maximum internal pressure defined in the ASTM C-147 standard. Volume measurements are also possible at various fill height positions.

MiniLab D

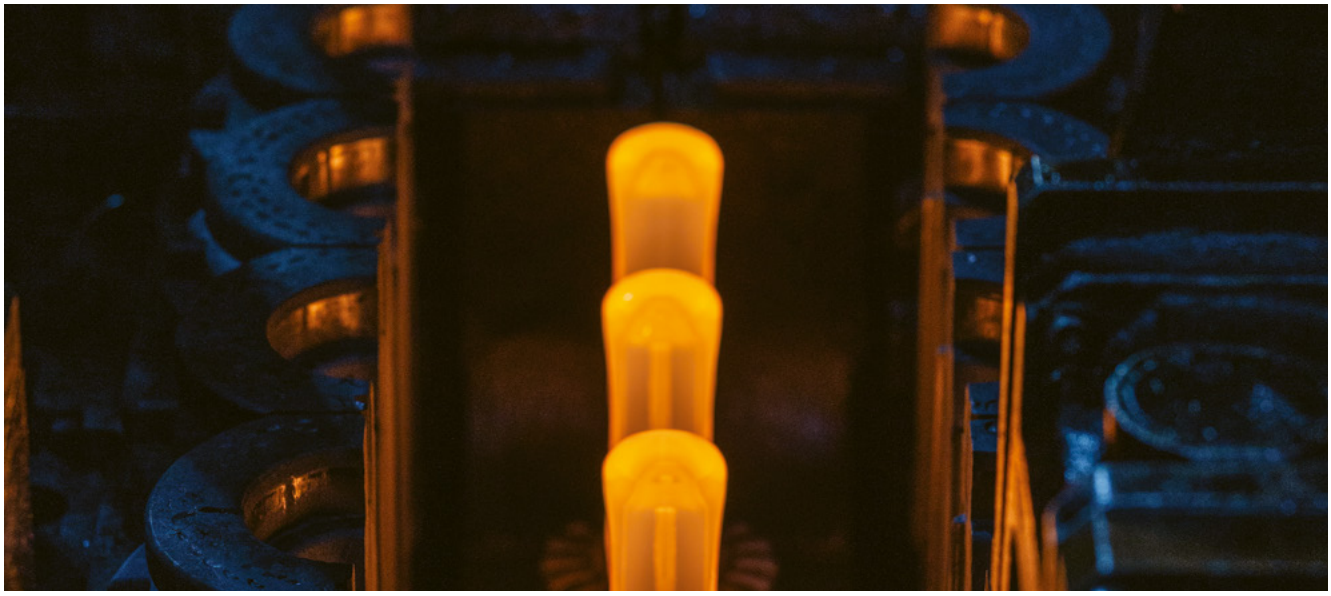
State-of-the-art vision technology using high-resolution cameras and servo-controlled handling for precision measurement of dimensional characteristics.

Wall Thickness Gauge

There are two options for the servo-controlled MiniLab D: non-contact chromatic sensor and multipoint non-contact chromatic sensor.

Who we are

At Bucher Emhart Glass, we are proud of our rich heritage and tradition of excellence that continues throughout our operations today.



Vision

To lead the way in autonomous glass forming, improving the work environment in glass plants and reducing the use of natural resources.

Mission

To be the partner who combines technology and support to enable the best performing glass plants in the world...

Purpose

...because we believe in the benefits of glass as the most sustainable packaging.

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 our future.

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