

TAMGLASS HTBS ProE™ Bending and Tempering

Glaston is your glass processing technology One-Stop-Partner providing Bavelloni, Tamglass and Albat + Wirsam products and services.

glaston
seeing it through®

Comprehensive expertise in safety glass processing

Tamglass is known as the reliable brand for safety glass machinery for the architectural, solar, appliance and automotive glass industries. Tamglass has delivered over 2,000 safety glass production lines to more than 70 countries during its close to 40 years of operation.

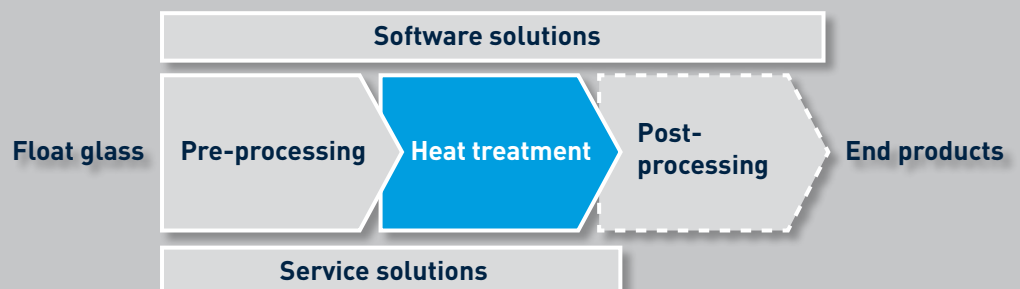
Tamglass is a trademark of Glaston Corporation. Glaston is the leading supplier of high-quality glass processing technology. Its customer service network is the largest in the glass processing industry, with over 30 local units around the world.

Glaston Corporation is a solid, growth-oriented technology company listed on the NASDAQ OMX Helsinki Ltd's Mid Cap List.



Glaston's One-Stop-Partner solutions

Glaston is your One-Stop-Partner for glass processing technology offering wide range of machines and services under brand names Albat+Wirsam, Bavelloni and Tamglass. Whether the request is for a single machine, production line or complete factory with production control, completed with the best service network and pre-processing tools, we have the right solutions for you to choose from.



Versatile production with high quality

HTBS ProE™ meets the requirements of the automotive, appliance and furniture glass industry. Furthermore, its capabilities cover any other area of application within its technical specification range. Be creative - HTBS ProE™ provides flexibility and quality. Increase the production output - HTBS ProE™ processes multiple glass pieces in one production load.

High accuracy bending conveyor with zero tooling

Repeatability plays a key role in high quality production. The patented mechanism of the HTBS ProE™ is developed and designed to meet the standards of today and the future. The intelligence in mechanical design also guarantees that the capabilities remain unchanged during the production. With no tooling, bending and tempering is as simple and cost efficient as in a high quality flat tempering process. Our experience builds on more than 70 units delivered around the world.

Extra rapid bending with sophisticated control

The minimum time of bending can be as short as one second, resulting in first class optical quality. This is especially important when thin glass is being processed. Proven, state-of-the-art control together with high accuracy computer control assures precision even in the most demanding process conditions. By its natural side-effect, extra rapid bending also boosts the capacity of the entire production line.

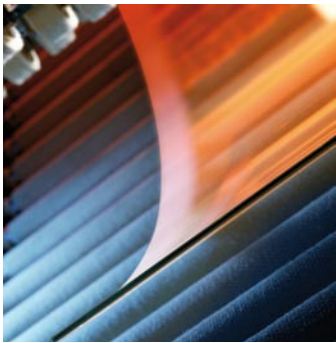


We are at your service

Glaston seeks to establish long-term business relationships through highly professional services prior to, during and following delivery. Our Service Solutions has established itself in several locations around the world in order to serve customers locally with a variety of services and products.



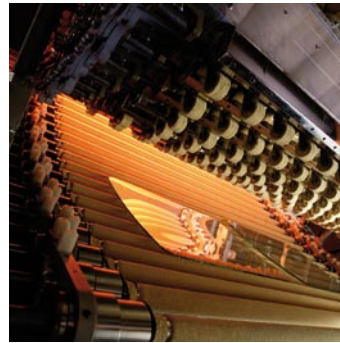
The future is around the next bend



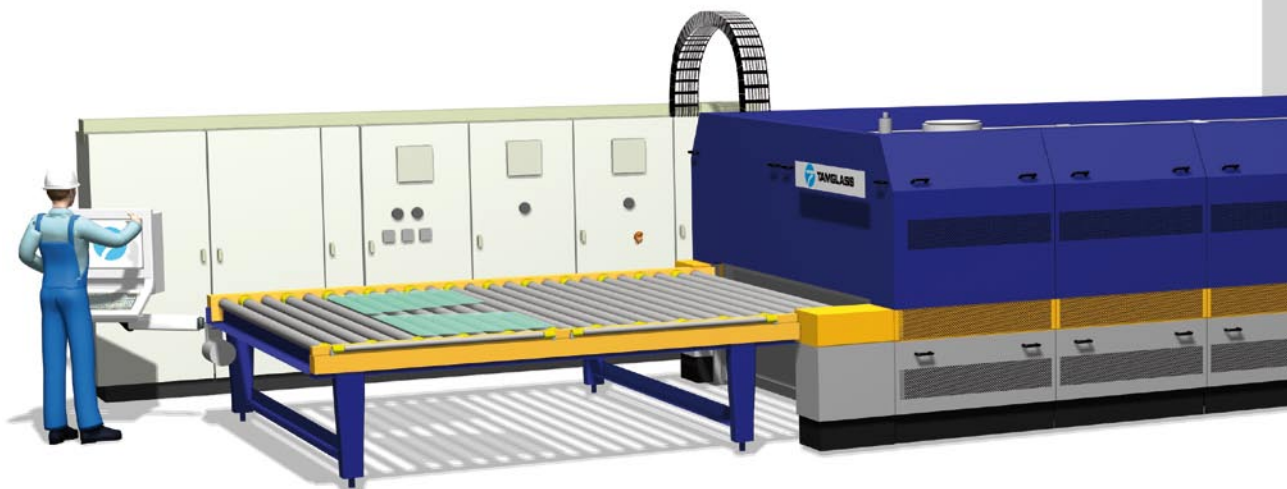
01



02



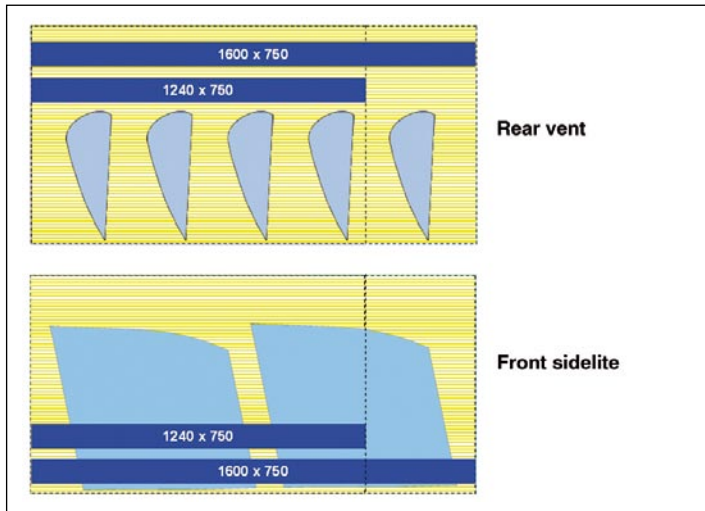
03



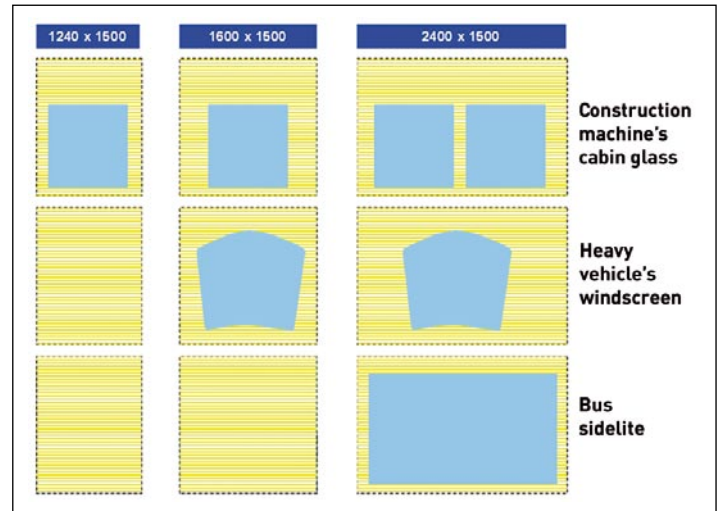
Reliable technology for tomorrow's tempering

HTBS ProE™ is designed with safety in mind. Long experience in the tempering field yields innovative features to protect their user, equipment and production.

Built-in safety features are part of the standard system design. Solutions are designed to fulfil national safety rules worldwide as well as European safety regulations and directives.



04



05

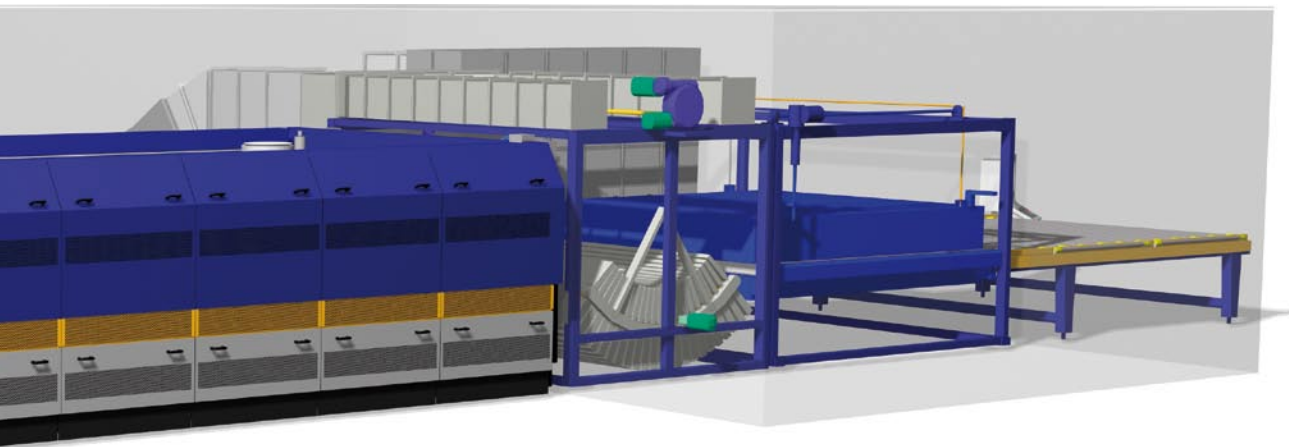


Image 01
QUICK BENDING LENGTHWISE WITH SOLID ROLLERS
 Best optical quality with one second bending time.
 Capability for triangular and other shapes times.

Image 02
ZERO TOOLING WITH 0-10 MINUTES CHANGEOVER
 Efficient also with mixed production deliveries.

Image 03
CAPABILITY FOR DOUBLE CURVED GLASS
 Crosswise shaped bending conveyor rollers together with shaped, adjustable, upper press wheels - cross bending down to R10000.

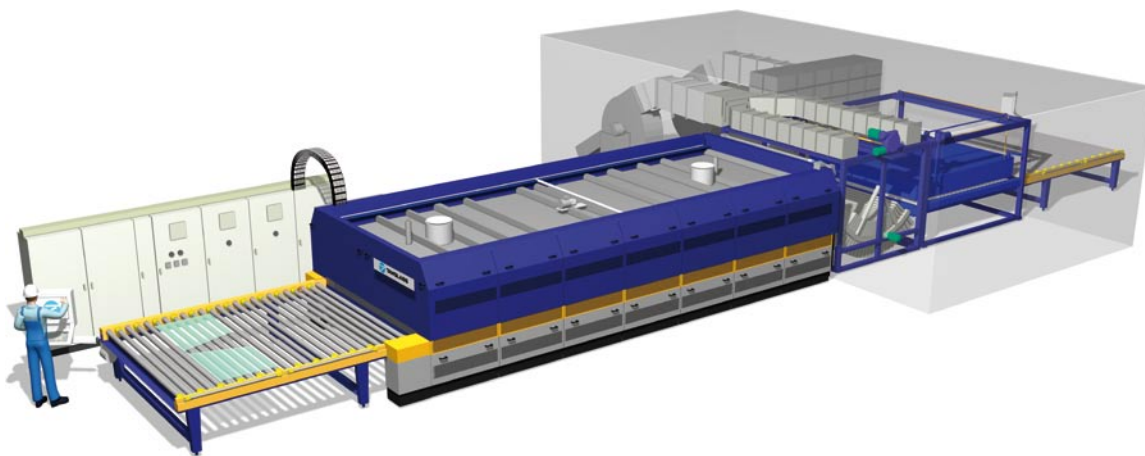
Image 04 and 05
FLEXIBLE LOADING AREA UTILIZATION
 Depending on size of the loading area multiple pieces of glass can be processed simultaneously.

Superior user benefits of the HTBS ProE™ system



Succeed in glass processing

Glaston offers the widest customer service network for the glass processing industry. We are committed to serving you efficiently, no matter what the continent or time zone - and in most cases in your own language. Our expertise as original equipment manufacturer offer you improved performance and machine availability through deep knowledge of machine operation and processes. To guarantee your fluent and continuous production Glaston Service Solutions provide services including spare parts, service agreements, service work, training & consultation and machinery upgrades throughout the lifetime of your machinery.



HTBS ProE 2400 - SERIES

Main components

- Loading and unloading conveyors with lifting tables
- Complete heating furnace system with forced top convection system, motorized opening
- Complete bending and quenching section
- Full bed press wheel system
- Complete final cooling section
- Blower system and duct work for quenching and final cooling
- Complete and independent drive system
- Hydraulic power unit and functional equipment
- Pneumatic functional equipment
- Pyrometer
- Electrical control cabins
- Wiring between the machine and control cabin (internal wiring)
- Emergency drive system with battery backup
- Windows-based control system, user friendly operation
- Installation supervision with operation and maintenance training
- Layout design for customer's factory
- Loading jig

Utilities supplied by the buyer

- Electric power supply for heating, drives and blowers; 5-wire system (3 phases, neutral and earth)
- Compressed air 7 bars (700 kPa)

Optional features (indicator in parenthesis)

- Boost unit for enhanced glass properties **(B3.1E/B3.1EL)**
- Heat strengthening system for 3 to 10 mm glass, ASTM1048 **(HS)**
- Noise reduction cabin with maximum noise level 85 dB(A) **(N85)**
- Cullet conveyor with container **(MC)**
- Quality monitoring system QMSTM for ISO 9001 / ISO 9002 **(QMS)**
- Other options available on request
- CARE - Glaston Care maintenance and consultation contract with remote online service ROLS™

Main dimensions

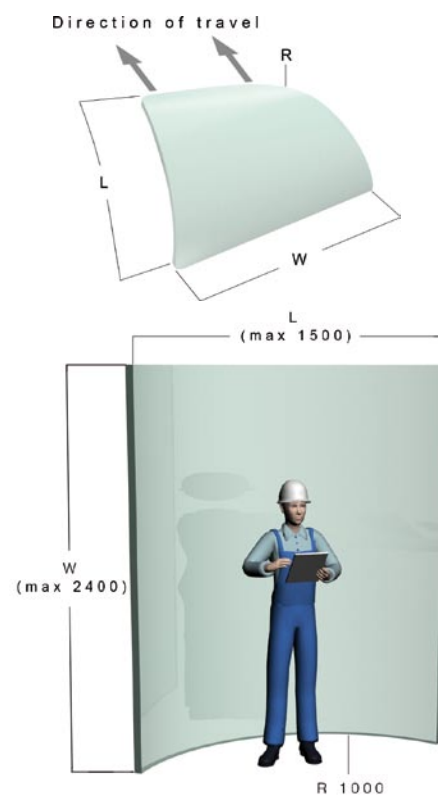
Furnace modules/stages	Length m	Width m	Height m	Blower room m
2	10	4.8	2.6	6 x 6
2 (with -2415-)	17	6	2.7	9 x 7
3	12	4.8	2.6	6 x 6
4 (with -2415-)	22	6	2.7	9 x 7
4	13.5	5.5	2.6	7 x 7
6	16	5.5	2.6	8 x 7

NOTE:
Dimensions of blower room are indicative of and subject to the factory layout. Location of the blower room according to the factory layout.

HTBS ProE product series, glass dimensions and installed power
Bending radius 1000 mm - flat, cross curvature R min 10.000 (option), thickness range: 3-6 (10) mm

HTBS ProE-	Max. glass size W x L	Batches / hour (3mm glass)	Installed power (kW)
1208-2	1240 x 750	44	450
1208-3	1240 x 750	67	550
1208-4	1240 x 750	92	700
1215-4	1240 x 1500	92	950
1608-2	1600 x 750	44	600
1608-3	1600 x 750	67	700
1608-4	1600 x 750	92	900
1615-4	1600 x 1500	92	1200
1208-6	1240 x 750	120*	900
1215-6	1240 x 1500	120*	1200
1608-6	1600 x 750	120*	1100
1615-6	1600 x 1500	120*	1400
2415-2-3.8A	2400 x 1500	42	1050
2415-2-3.1E	2400 x 1500	42	1300
2415-4-3.8A	2400 x 1500	85	1550
2415-4-3.1E	2400 x 1500	85	1800

NOTE:
* with optional enhancement 144 batches / hour
** Total connected power does not correspond to the transformer size



HTBS ProE 1200/1600 - SERIES

Main components

- Loading and unloading conveyors
- Complete heating furnace
- Complete bending and quenching section
- Full bed press wheel system
- Complete final cooling section,
- Blower system and duct work for quenching and final cooling
- Complete and independent drive system
- Hydraulic power unit and functional equipment
- Pneumatic functional equipment
- Emergency drive system with battery backup
- Installation supervision with operation and maintenance training
- Pyrometer
- Electrical control cabins
- Wiring between the machine and control cabin (internal wiring)
- Windows-based control system, user friendly operation
- Installation supervision with operation and maintenance training
- Layout design for customer's factory
- Loading jig

Utilities supplied by the buyer

- Electric power supply for heating, drives and blowers; 5-wire system (3 phases, neutral and earth)
- Compressed air 7 bars (700 kPa)

Optional features (indicator in parenthesis)

- Boost unit for enhanced glass properties (**B3.1E/B3.1EL**)
- Heat strengthening system for 3 to 10 mm glass, ASTM1048 (**HS**)
- Noise reduction cabin with maximum noise level 85 dB(A) (**N85**)

- Flat glass option for big glass sizes +2400-3.8A
- Cullet conveyor with container (**MC**)
- Quality monitoring system QMSTM for ISO 9001 / ISO 9002 (**QMS**)
- Other options available on request
- R10 000 mm cross curvature system with 1500 mm long bending conveyor (**FPS/C**)
- Other options available on request
- CARE - Glaston Care maintenance and consultation contract with remote online service ROLS™

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SUSTAINABLE GLASS PROCESSING TECHNOLOGY



Glaston takes into account the entire lifecycle of its machines. One key issue is to design and manufacture the constructions to tolerate heavy use. Upgrades and relocations also extend the lifetime of the machine in the market place. Special attention has been paid to the recyclability of materials, particularly to wearing components and parts.

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