

The future we see through

WARE HANDLING

AP PUSHER
CONVEYOR
CONVEYOR PROTECTION
TRANSFER WHEEL
CROSS CONVEYOR
STACKERS (SDA02 - SDA03)
THERMOSHOCK

OUR HERITAGE

Since 1906, BDF Industries' principal activity has been the development and integration of complex technologies to aid industrial progress.

The **worldwide market** depends on BDF's multitasking, multicultural, and multi-expertise strategy, which has evolved and shaped itself over the years in response to market demands.

BDF provides the chance to join a top-notch technological group ready to compete with present and future business opportunities in terms of **competitiveness, performances, and reliability of products** and processes thanks to its natural collaborative instinct and the professionalism shown in more than **115 years of tradition**.

The future we see through.

OUR MISSION

Manufacturer of cutting-edge machinery, BDF Industries is a group where innovation and performance converge in a never-ending quest for excellence.

MELTING



For the design and supply of furnaces, working ends, and forehearth, BDF Industries Melting's product portfolio comprises the whole glass melting and conditioning technologies. Additionally, **relevant equipment** including oil and gas burners, firing system air, exhaust reverse valves, batch chargers, and stirrers are part of the product line.

BDF Industries furnaces are engineered with an **high level of customization**, focusing in particular on energy efficiency and environmental impacts. BDF Industries is able to offer a wide range in **design, manufacture, and supply** of different furnace types for production of containers, tableware, lighting ware, and technical glassware due to a long history of experience combined with a team of skilled people who work together in a synergistic way..

FORMING



The glass container Forming product line of BDF Industries is the company's historical primary activity. BDF Industries can supply a wide range of **machines with a high level of production flexibility** to satisfy the needs of its customers.

With more than 65 years of experience in glass forming field, BDF Industries can offer a complete range of IS machine including gob forming and delivery, ware handling, container and variable equipment. The glass forming machineries are **fully designed and assembled** in house at BDF Industries **in Italy**, which has relevant knowledge of production process with the most important glass manufacturers in the world (e.g. strong credentials for forming business in O-I, Saverglass, Sisecam, Vetropack, Vitro...).

SERVICE



BDF Industries has a Service division dedicated to provide a comprehensive range of **high-quality service solutions** to our clients from a single source. From glass melting to forming, filtering, energy facilities, and automation, our services serve the whole product value chain.

The service product line includes installation & startup, upgrades of mechanical equipment and automation, technical assistance for repairing and overhauling, training, performance evaluation & long term service agreement, integrated maintenance management & diagnostic solutions and systems, spare parts.

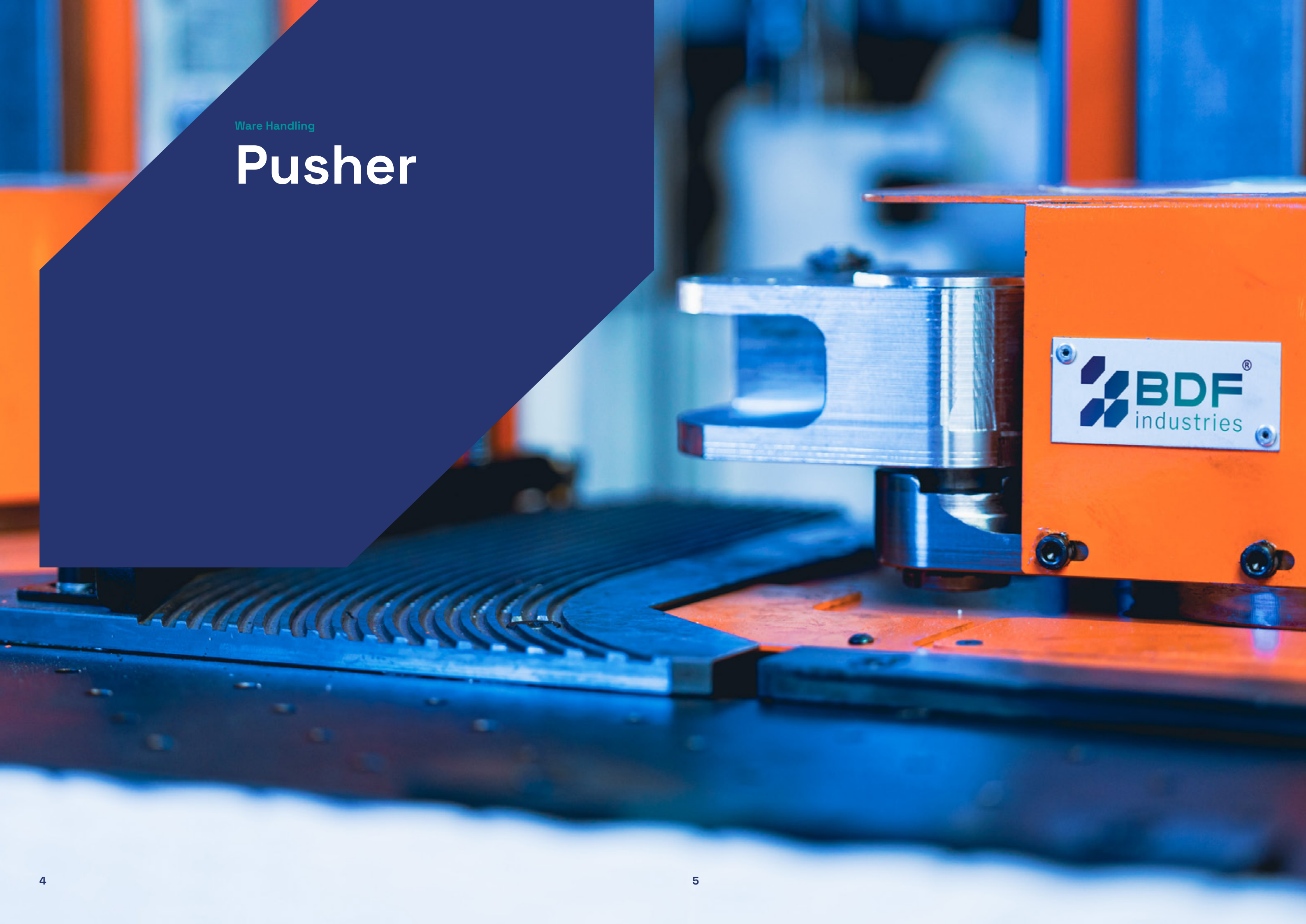
The contents of service are the following:

- Supply local qualified supervisors
- Supply of certified end/or upgraded OEM (Original Equipment Manufacturer) spare parts for all maintenance operations
- Performance of all equipment maintenance
- Repairs using state-of-the-art technology
- Optimization of Spare Parts inventory
- On the job Training of local maintenance and operation personel.

The BDF Industries Learning Center in Italy, as well as strategically situated Service Centers, provide a comprehensive range of technical training. Our technical courses are taught by field-tested experts who combine theoretical knowledge with practical expertise.

Ware Handling

Pusher



AP PUSHER

MAIN DATA

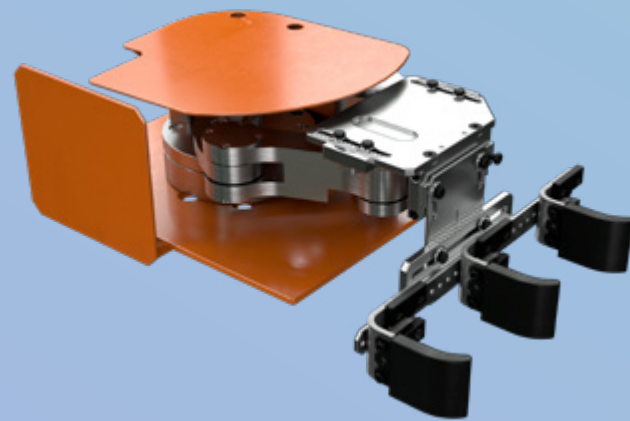
- Controlled by two coaxial torque motors
- Max conveyor speed = 50 m/min
- Articulated pentalateral linkage for the fingers control
- Control with 3 degrees of freedom on the fingers
- Available for all machines and conveyor types
- SG - DG - TG - QG

BENEFITS

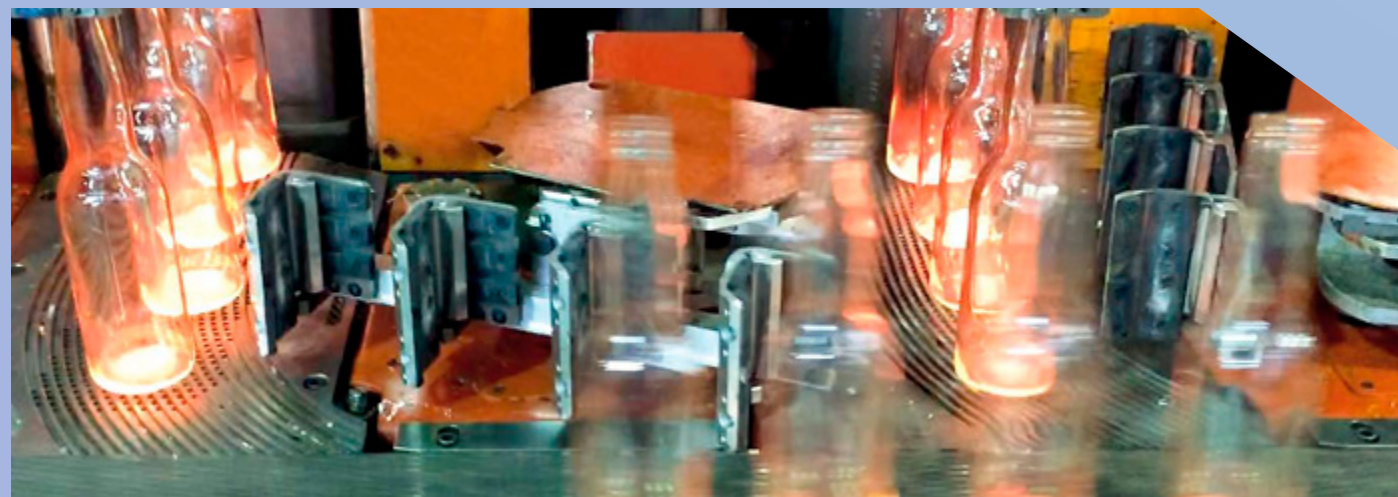
- No belt transmission or reduction gear on the drive but only a linkage system for a very reliable mechanism
- Low inertia high rigidity design
- Accurate wares handling with the possibility to adjust the angular and axial positioning of the wares on the conveyor
- Very good performances on high-speed conveyors
- High flexibility with the cam generator

MECHANICAL FEATURES

- Motors and linkage in alluminum alloy
- Integrated or stand alone control with the possibility of easy synchronization with no BDF IS forming machines
- Use of digital drives and brushless torque servo motors
- Possibility to easily modify the cam parameters from the machine computer
- Cam Generator Software to make or modify the cam profile



Bottles delivery



AIR JET AP PUSHER

MAIN DATA

- Max conveyor speed = 65 m/min
- Use the venturi effect
- Independent and easily accessible airflow adjustments for each cavity positioned upon the finger
- Finger suction with regulated compressed air (4.5bar)
- Available for bdf AP pusher mechanism in DG-TG-QG

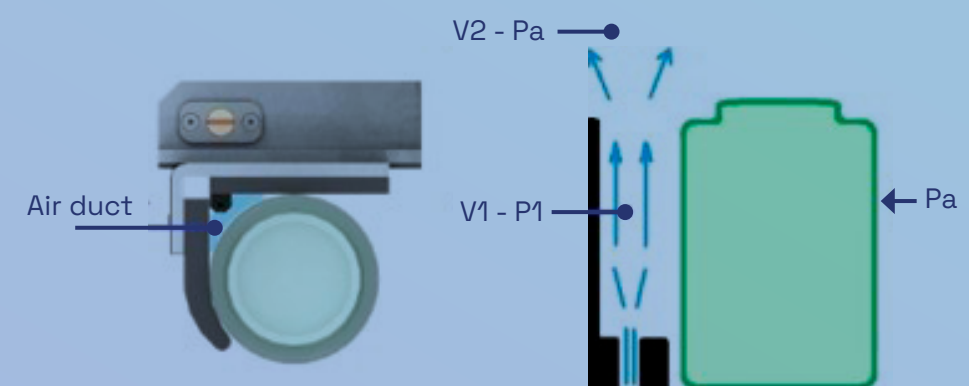
BENEFITS

- Increased bottle stability for high-speed conveyor
- Minimize harmful air flow to keep the bottle temperature under control



VENTURI EFFECT

The Venturi effect states that in a situation with a constricted section of a duct, the pressure of the fluid reduces. The air duct consists of the residual space between the pusher finger and the bottle. When an high speed air flow goes through in this space, a depression happens in relation to the outside normal pressure. In this way, the atmospheric pressure will push the bottle against the pusher's finger.



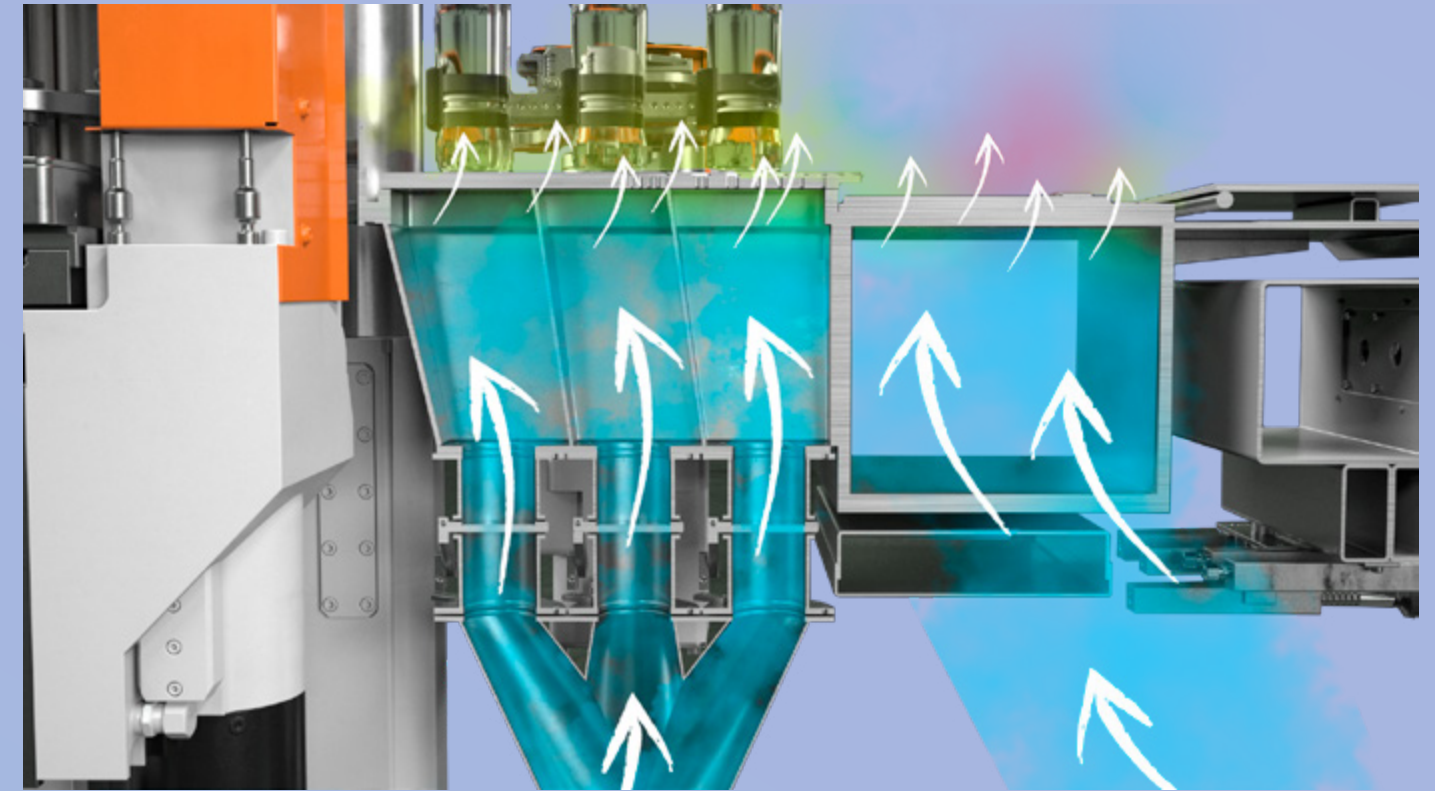
Ware Handling

Conveyor

CONVEYOR HSS

GENERAL FEATURES

- Accurate ware positioning & handling combined with AP Pusher operation very good performance on high-speed conveyors (up to 750 bottles/min, 10-12 sec. and tandem IS machines, also in DGTG) flexibility and possible adjustment of bottles' angular and parallel position on the conveyor
- High-reliability thanks to direct drive transmission with no belt
- Higher cooling management
- Independent air feed wind box and dead plate cooling for each cavity
- Independent (not from conveyor frame) axial air feed with timing control
- High flexibility and adjustment for different containers
- Wind box with adjustable dead plate height
- Precise alignment and tension thanks to a 3-level adjustment belt tightener
- Low maintenance
- Sturdy structure with moveable beam support
- Hs-conveyor designed for 10-12 sections and tandem machines up to 750 bottles/min
- Servo pusher mechanism with two motors (AP-pusher)
- Independent control of dead plate air cooling for cavity
- Independent axial air feed with timing control
- Wind box with dead plate height adjuster
- Conveyor beam supports and lifting device
- Conveyor belt tightener



Double direct air flow
for DG - TG - QG





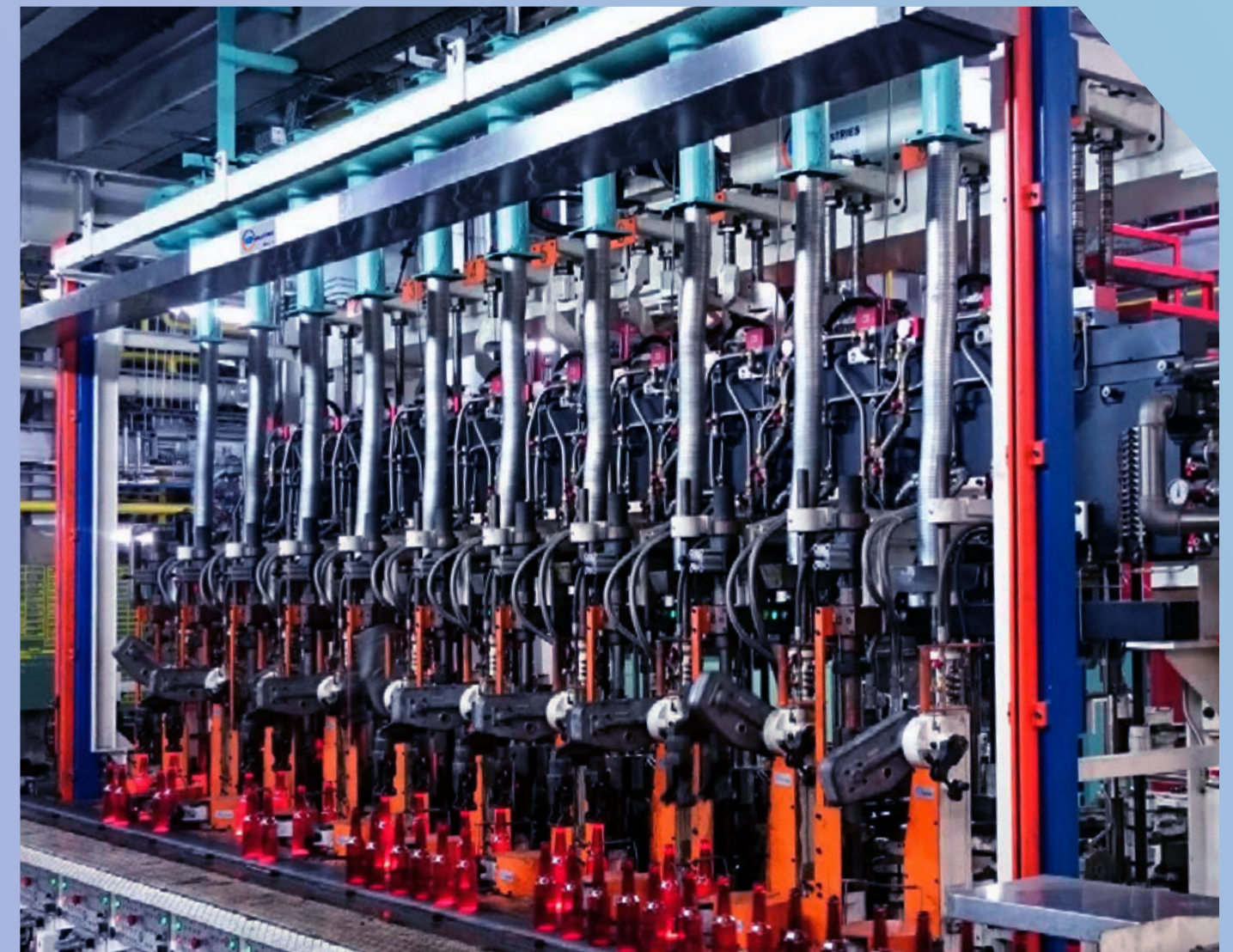


CONVEYOR PROTECTION COVER

Mainly required for containers' production addressed to:

- Baby food
- Pharmacy
- Cosmetics
- Avoidance of any contamination of foreign materials coming from glass production operations in the plant
- Cover's adjustable height on the conveyor
- Sturdy and stable structure fixed onto the IS machine
- Light structure with stainless steel cover for conveyor, transfer wheel, cross conveyor

IS machine

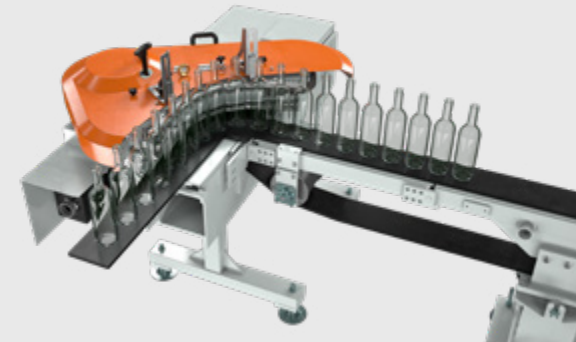


Ware Handling

Transfer Wheel

NEW TRW 1305 HS

This transfer has been specifically developed for use with high speed production lines. Max speed 500 bottles per minute.



FEATURES & BENEFITS

- Precise retraction of pushing fingers on the output side of the transfer wheel
- Adjustable top and bottom ware guide
- Operate with 150, 175, 200, and 250mm wide delivery belts
- Small width of the transfer plate (120 mm)
- Chain: pitch 3/4", length 90" (120 links), double row with extended pins
- Chain tension system
- Phase/emergency clutch
- Quick change finger & different finger size

NEW TRW HSS DOUBLE CHAIN

Ware transfer system specifically developed for handling containers on TG and QG production machines with high-speed production lines. Max speed 900 bottles per minute.

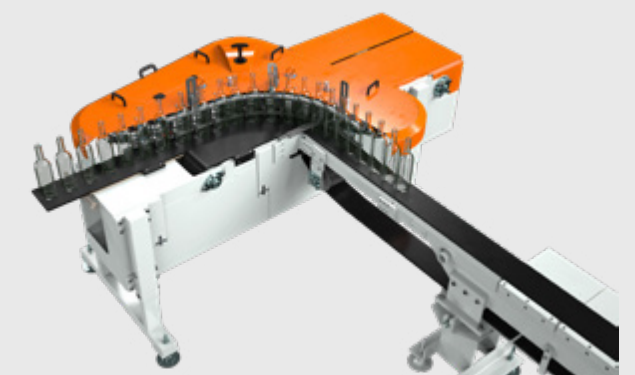
FEATURES

- Double belt conveyor drive and transfer wheel with a large transferring radius
- Short conveyor belt speed can be regulated independently
- Precise retraction pushing a finger on the input and the output side of the transfer wheel
- Adjustable top ware guide (in-out & up-down) and bottom wareguide (in-out regulation)
- Chain: pitch 3/4", length 157.5" (210 links), double row with extended pins
- Electronic timer and clutch handling
- Phase and emergency clutch
- Quick change finger
- Optimize lubrication system

Standard conveyor belt configuration: 6" wide conveyor belt + 8" wide short conveyor belt.

BENEFITS

- Smooth and accurate container positioning to the cross-conveyor belt due to a special finger motion system
- Short conveyor belt ensures that container are in steady contact with the finger during the transfer



Ware Handling

Cross Conveyor

TYPE 3800 TYPE 3900 WATER-COOLED

MAIN STRUCTURE

- Divided into individual adjustable sections to correct possible structural deformations due to the heat given off by the annealing lehr

GENERAL FEATURES

- Simple and strong construction
- Individual adjustable sections on the structure
- Adjustable cross conveyor height
- Dead plates in refractory steel
- Supplied for all lehr widths
- Low maintenance
- Reduced wearing parts
- Air or water cooled

DRIVE SYSTEM

- Oscillating drive group for belt constant self-tensioning
- Gear reducer directly coupled to the motor

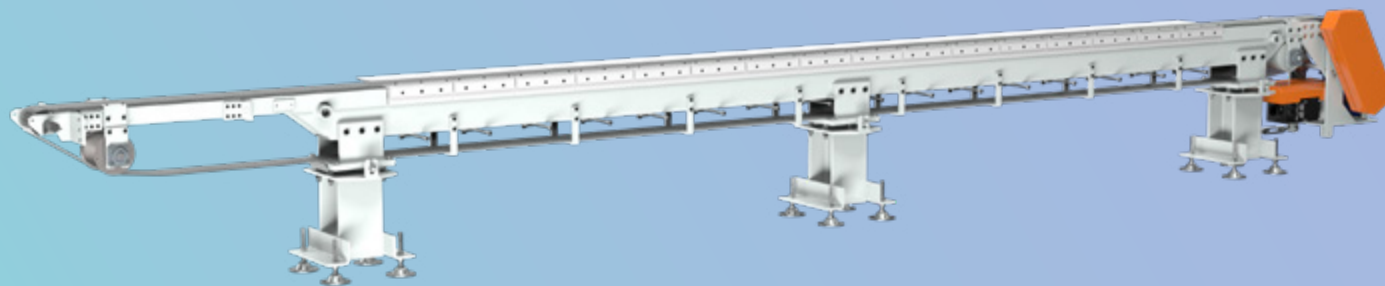
CONNECTION TO THE ANNEALING LEHR

- Stainless steel dead plate
- Each plate is freely connected to the cross conveyor frame by means of two pins and, on the opposite side, it lays on the lehr belt
- An adjusting device to be operated from outside the cross conveyor allows to adjust the height of the plates for an optimal connection between the cross conveyor and lehr

Cross-type 3800



Cross-type 3900 Water Cooled



Stacker



SDA 02 DUAL AXIS SERVO STACKER

GENERAL FEATURES

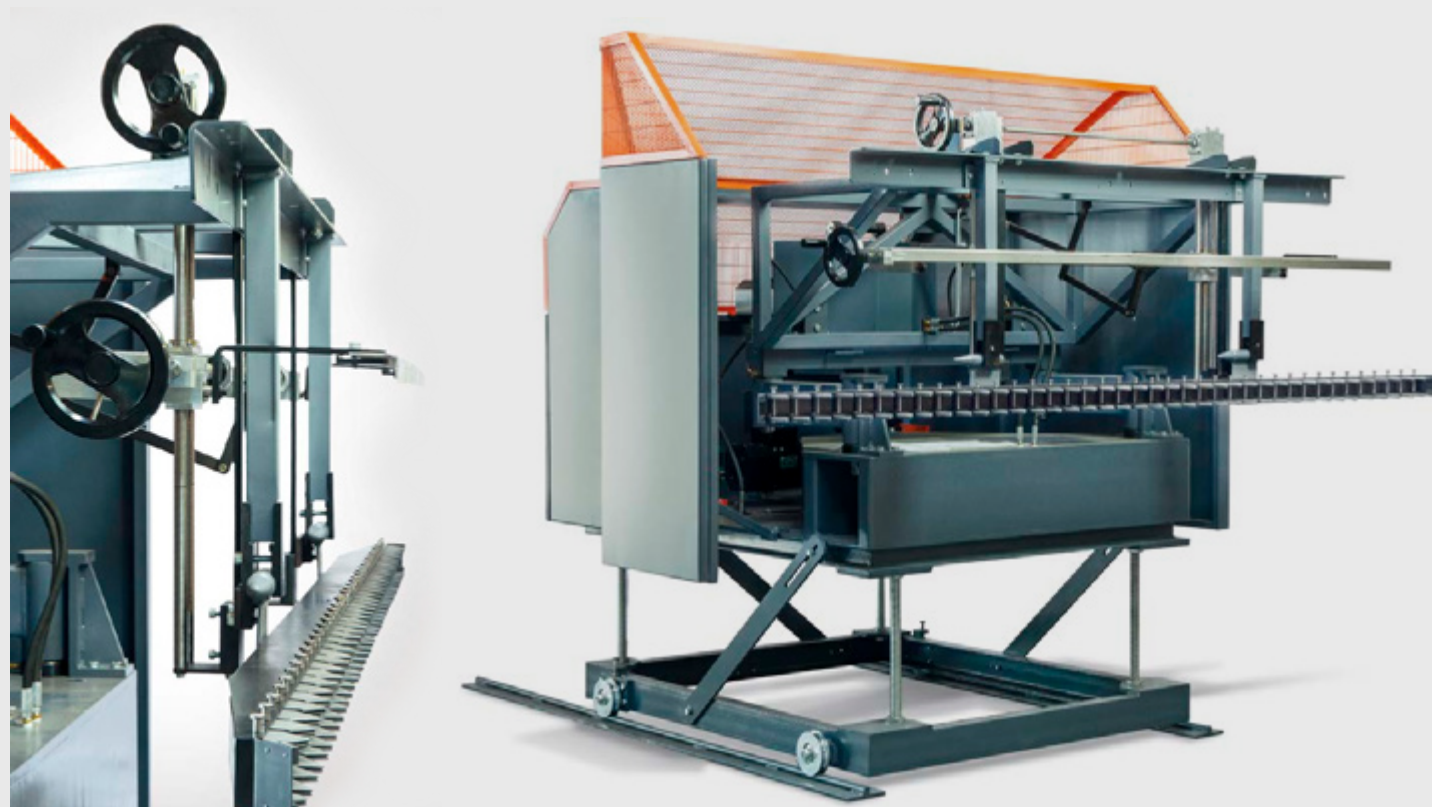
- Rotation and arm movements controlled by two identical brushless servo motors
- Installed on rails with an easy and quick withdrawal system
- Push-bar with variable step inserts and ready to accept different types of inserts
- Inserts in graphite with easy change system
- Faster push-bar replacement
- Accurate and absolutely repeatable movements
- Extremely reduced maintenance
- Different types of cycle synchronization
- User-friendly operator interface
- Programming, saving, loading of configuration and production data
- Stabilization bar (optional) with height adjustment

TECHNICAL DATA

- Cycle speed: up to 11.5 cycles per minute
- Cross conveyor speed: up to 45 m/min
- Glass containers max. height: 450 mm

PUSH-BAR

- Max. width 4500 mm
- Min. inserts centre distance: 60 mm
- Inserts step: 20 mm
- Stroke in lehr direction: 415 mm
- Side shift stroke: 430 mm
- Admissible lehr belt height: 800 ÷ 950 mm
- Min. fingers quote: 825 ÷ 980 mm



SDA 03 THREE AXIS FULL SERVO STACKER

GENERAL FEATURES

- X-Y-Z axis movement controlled by three brushless servo motors, accurate and absolutely repeatable movements
- Installed on rails with an easy and quick withdrawal system
- Safety guards
- Kit of inserts in graphite with easy change system
- Push-bar with compressed air cooling capability
- Stabilization bar for particularly unstable ware, with remote horizontal and vertical adjustment
- Extremely reduced maintenance
- Different types of cycle synchronization
- User-friendly operator interface
- Easy data programming, saving, and loading of configuration
- Operator terminal and control installed on top of the cabinet

TECHNICAL DATA

- Cycle speed: up to 21 cycles per minute
- Cross conveyor speed: up to 60 m/min
- Glass containers max. height: 500 mm

PUSH-BAR

- Max. width 4500 mm
- Min. inserts centre distance: 60 mm
- Inserts step: 20 mm
- Stroke in lehr direction: 480 mm
- Side shift stroke: 480 mm
- Vertical stroke: 525 mm
- Admissible lehr belt height: 800 ÷ 1100 mm



Ware Handling

Ancillary

THERMOSHOCK TESTING MACHINE

The machine is essentially formed by a basket where the containers are placed in vertical position, and by two tanks, one containing hot water with the heating element, and one containing cold water. Two pumps provided to maintain water at the required temperature by circulation of hot water and cold water respectively.

Each tank has a thermometer allowing it to read the water temperature with $\pm 1^\circ\text{C}$ accuracy. An automatic programmer transfers the container basket from the hot to the cold bath.

- Construction material of the tanks: AISI 304
- Overall dimensions: 2600 x 1600 x h 1750 mm
- Weight: 910 Kg

MECHANICAL FEATURES

- The machine is provided with hot and cold water tanks
- The tanks are provided with pumps for continuous water flow from the lower part to the upper one of each tank
- Useful capacity of each tank: 270 litres

FEATURES & BENEFITS

- Testing time is about 6 minutes per the following specifications:
Max thermal head: 65°C (with cold water at 20°C and hot water at 85°C)
- System accuracy: $\pm 1^\circ\text{C}$
- Transfer time of the basket: 15 ± 2 seconds
- Basket dimensions where to put the bottles: 600 x 550 x h 400 mm

ELECTRICAL FEATURES

- The machine is provided with one hot and cold water temperature control system by means of 2 electronic regulators and 2 thermocouple
- Heater power: 16 kW
- Total installed power: 20 kVA
- Power supply (typical): 400 V – 50 Hz threephase





