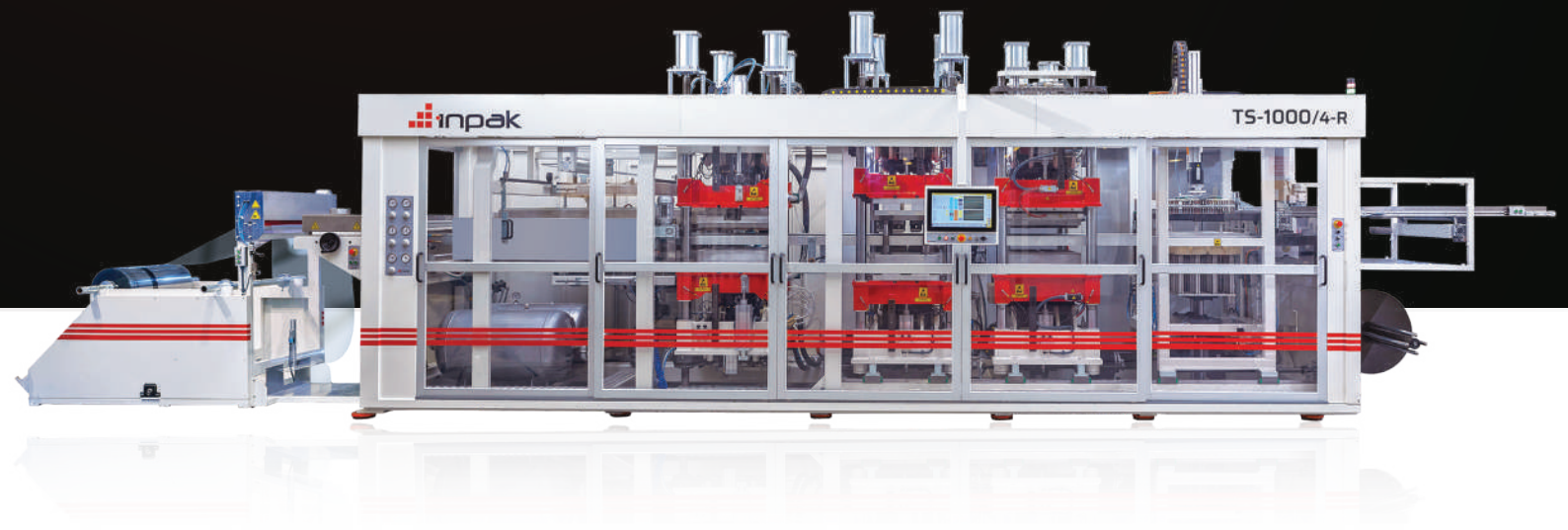
THERMOFORMING MACHINES

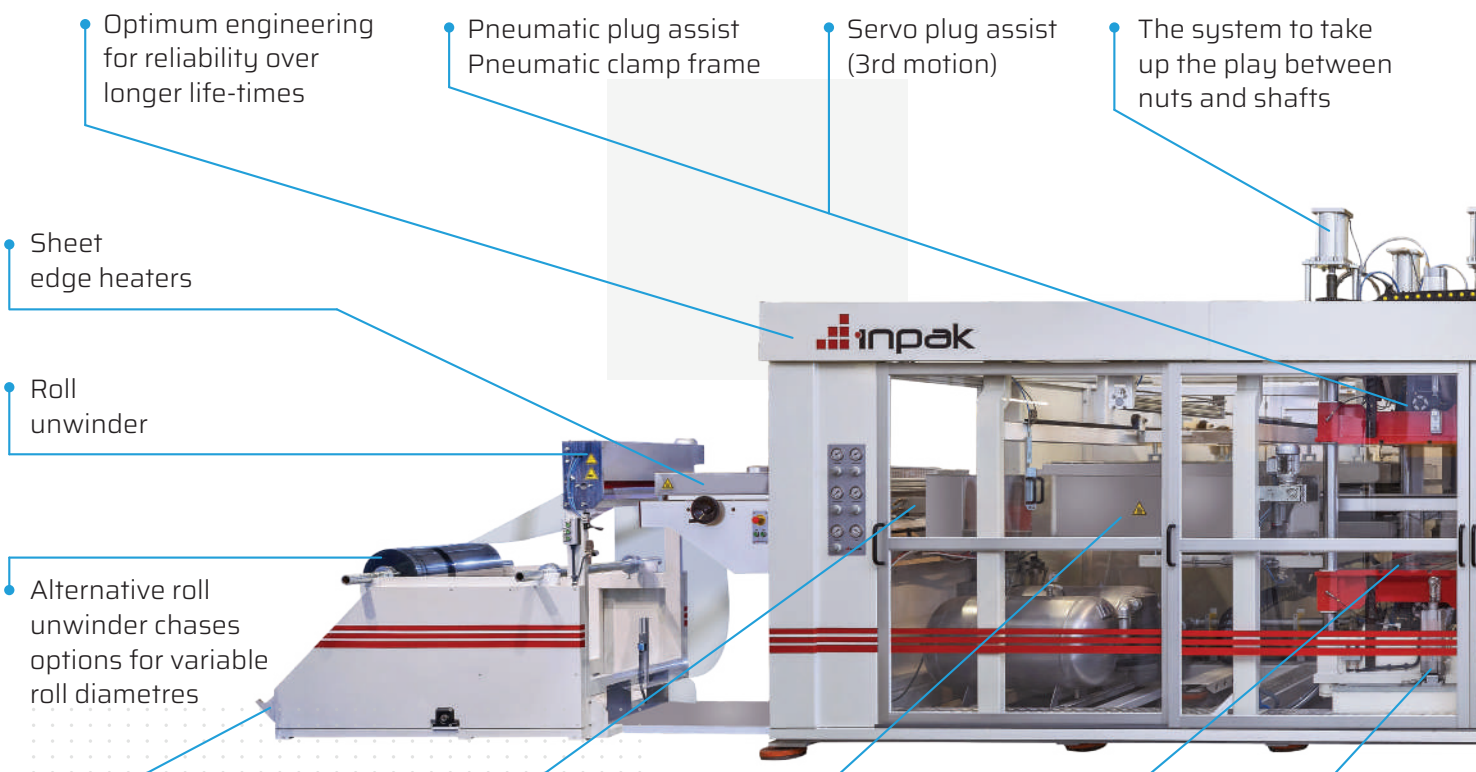


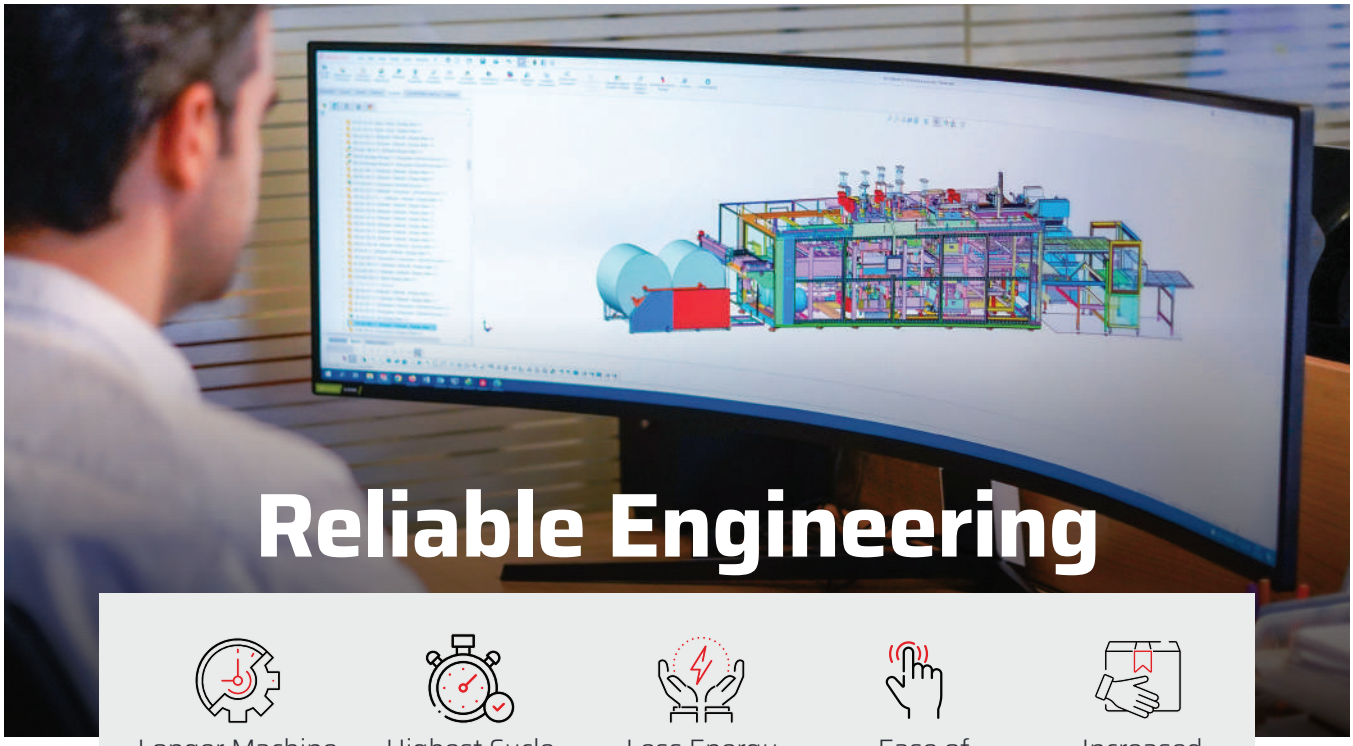
inpak

WHY INPAK?

Building Trust & Continuous Partnerships

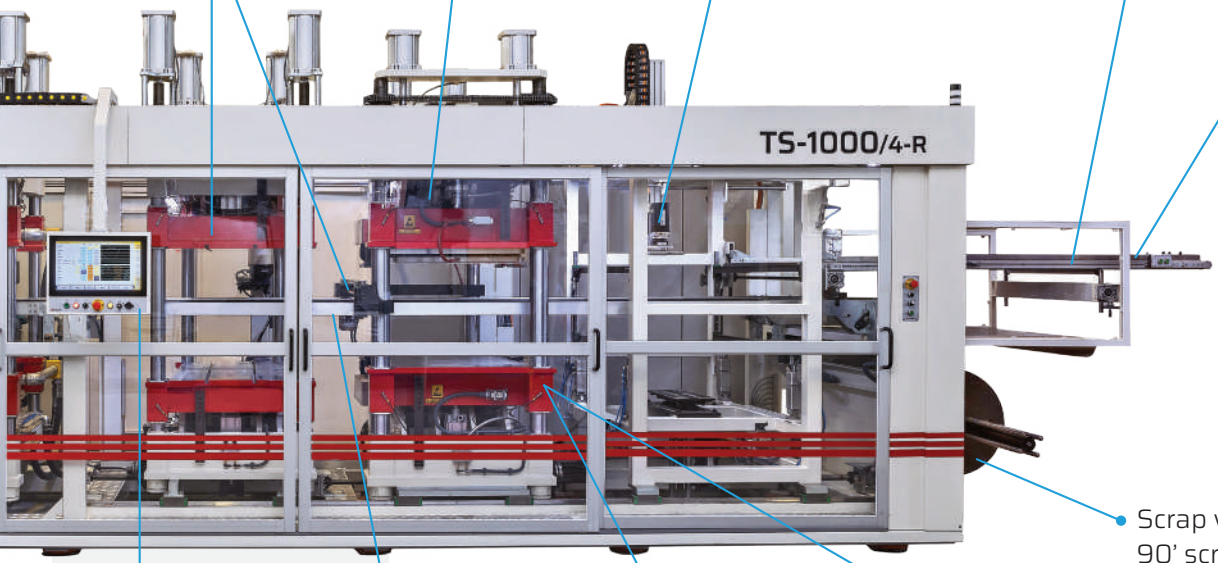
- Enabling 24/7 machine running to produce packaging at their best
- Longer lifetime in its range with ability of providing minimum production cost per product
- Keeping the high performance and real efficiency (OEE) through the machine lifetime





Reliable Engineering

- Longer Machine Lifetime
- Highest Cycle Speeds
- Less Energy Consumption
- Ease of Use
- Increased Availability



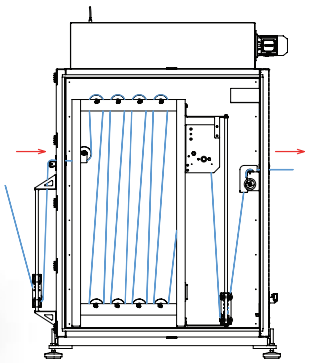
- Automatic Central Lubrication
- Long-life needle bearings, gapless joints in all toggles
- Traditional stacker
  Servo A-B stacker
  Fast robot stacker
  Lid robot stacker
  Additional down-stacker
- Variable out-conveyor configurations & low-level handling conveyor unit
- Highest cycle speeds
- Scrap winder & 90' scrap rotator
- Remote access
- Ease of Use
- Width adjustable chain rail system from 4/5 points
- Energy efficient regenerative servo systems
- Height adjustable lower punching and cutting stations

GENERAL	In-Mould Cutting TSR-800	TS-800	TS-850	TS-1000	
Maximum Mould Dimensions	800x580		850x650	1000x750	mm
Cycle Speed Max. (Dry Cycle)	75			70	
Maximum Sheet Width	840		890	1040	mm
Maximum Sheet Thickness	1,5 (PET, CPET, PP, PVC, PS, OPS, PLA)				mm
Air Pressure	6				Bar
Vacuum Pump	100			200	m3/h
Power Consumption	25-50			40-75	kW
Total Installed Power	130-170			240-260	kW
Control Unit	B&R Industrial PC				
Touch Screen	B&R Colorful, 18,5"				
Central Lubrication	BEKA-MAX PC Controlled				
Software	Inpak				
PRE-HEATER					
Heaters Power	30			45	kW
Storage Length	15			25	m
Max. Temperature	130				°C
HEATERS					
Length of Heater	1800		2010	2260	mm
Upper Heating Power	50	38-(50)	64	92	kW
Lower Heating Power	50	38-(50)	64	92	kW
FORMING UNIT					
Upper Forming Depth	140				mm
Lower Forming Depth	140				mm
Clamping Force	800	300-(500)	500	600	kN
Platens Stroke (Upper / Lower)	150/150				mm
HOLE PUNCHING UNIT					
Platens Stroke (Upper / Lower)	150/150				mm
Clamping Force	500			600	kN
CUTTING UNIT					
Platens Stroke (Upper / Lower)	150/150				mm
Clamping Force	600			800	kN
CONVENTIONAL STACKER					
Max. Vertical Stroke	500				mm
Max. Horizontal Stroke	600			800	mm
PACKING DETAILS					
Length (with Pre-Heater)	11000	12000	12300	14000	mm
Width (with Elc. Cabinet)	2700			3200	mm
Height	2850			3050	mm
Weight	13000-22000				kg

Material Unwinder System

- Roll lifting system - Hydraulic
- Able to work with double roll
- Analog controlled, non-stop roll opener

Pre-Heating System

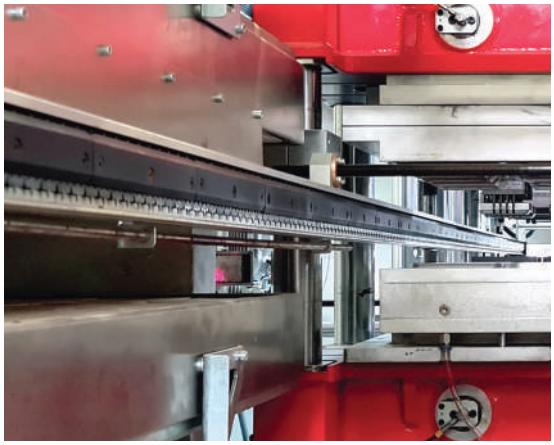


- 15m in preheating system with 30kW hot air circulation capacity
- 25m in preheating system with 45kW hot air circulation capacity

This is an oven which ensures high heat materials like PP to expand naturally before the plastic sheet enters into the thermoforming machine and its chain pins. This eliminates distortion on the sheet and reduces sagging.

Chain & Rails

- Servo driven transport chains
- Sheet edge heaters (Quartz) at infeed
- JWIS chains
- Water cooled, aluminum profile chain rails
- Motorised rail distance adjustment from four points, with rotary encoder for measurement
- Automatic sheet stretching system adjustable on the screen (especially for PP sheet material)
- Automatic chain lubrication - PC controlled
- Photocell for pre-printed sheet



Scrap Winder

- Asynchronous winder motor with electronical torque control
- Pneumatic discharging system of scrap.

Heaters

INPAK heating capabilities can work with all thermoformable materials (Bio-based, fossil-based, biodegradable, compostable, recyclable materials)

- Ceramic heaters in top and lower heater trays, individually adjustable (line by line), made from AISI-304 stainless steel
- Infrared temperature measurement on sheet surface
- Double sensor control against sheet sagging

Heater trays construction and heater control configurations are designed with high **energy efficiency** in mind.

In the heaters of the machines, HTS type resistors are used which has internal insulation. That gives more targeted radiation effect which achieves **30% energy saving** than conventional heaters.

Variable heater configurations are available according to specific needs.

- Row by row control, close to forming unit.
- Individual heater element control options.
- Covering plate in heaters infeed.

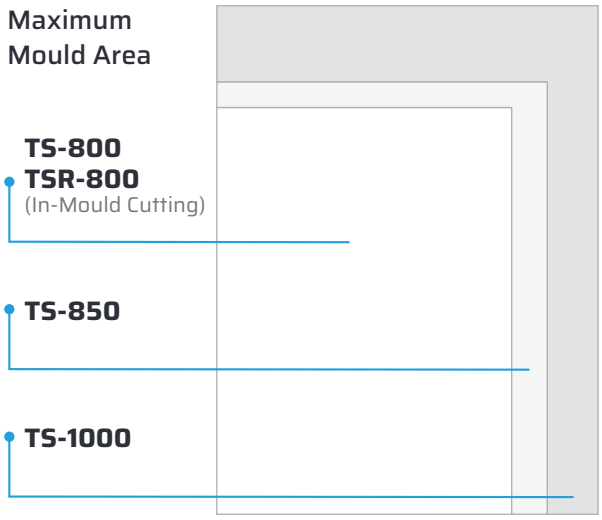
HEATERS	TSR-800	TS-800	TS-850	TS-1000	
Upper Heating Power	50	38/50	64	92	kW
Upper Heating Power	50	38/50	64	92	kW
Number of Adjustable Heater Lines	12	9/12	12	15	
Dimensions of Trays	L 1800 x W 860	L 1800 x W 860	L 2010 x W 915	L 2260 x W 1060	mm

Forming Station

Inpak provides best thermoforming process capabilities with reliability.

- 4 Column - Servo motor driven groups
- Servo driven plug assist on top press (optional bottom)
- Forming by air pressure and / or vacuum
- Tool fixing system with electrical safety interlocks
- Clamp frame or plug assist on top and bottom former
- Motorised mould height adjustment
- Pneumatic weight balancing system
- Long-life, special needle bearings, gapless joints
- Systems for taking up the play between the nuts and shafts whilst in group motions
- Flow control sensor for cooling water

Maximum Mould Area



FORMING	TSR-800	TS-800	TS-850	TS-1000	
Max. Mould Size	800 x 580	800 x 580	850 x 650	1000 x 750	mm
Upper Forming Depth	140	140	140	140	mm
Lower Forming Depth	140	140	140	140	mm
Clamping Force	800	500	500	600	kN
Platens Stroke (Upper/Lower)	150/150	150/150	150/150	150/150	mm

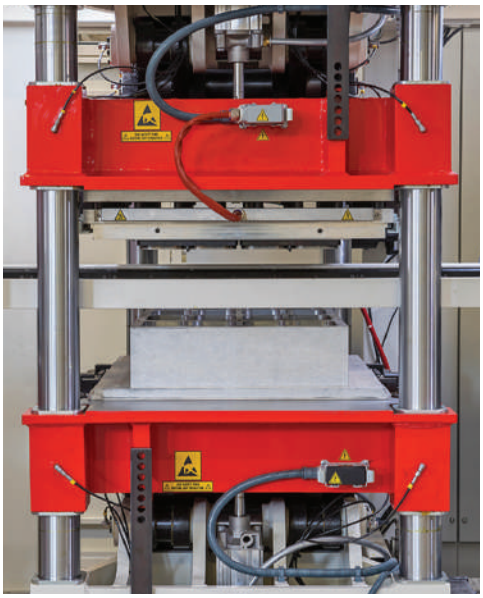
- TS Series of machines have separate forming and cutting stations.
- TSR Series of machines have in-mould cutting capability in forming station.

Hole Punching Station

- Servo motor driven, top and bottom independent
- Individual motion control of stroke movement of top and bottom hole punch tables
- Motorised vertical adjustment of top table
- Motorised position adjustment of station with rotary encoder
- Pneumatic weight balancing system
- Long-life, special needle bearings, gapless joints
- Vacuum device for hole punching scraps

HOLE PUNCHING	TSR-800	TS-800	TS-850	TS-1000	
Clamping Force	500	500	500	600	kN
Platens Stroke (Upper/Lower)	150/150	150/150	150/150	150/150	mm

Cutting Station



- Servo motor driven, top and bottom independent
- Motorised precision cutting adjustment on top table by 0,03mm/pulse
- Cutting knife heating (max. 170°C) and isolation plate
- Motorised cutting knives X-Y adjustment system with measurement by rotary encoder
- Motorised position adjustment of station with rotary encoder
- Tool fixing system with electrical safety interlocks
- Pneumatic weight balancing system
- Long-life, special needle bearings, gapless joints
- System for taking up the play between the nut and shaft (very important for long knife life)

CUTTING	TSR-800	TS-800	TS-850	TS-1000	
Clamping Force	600	600	600	800	kN
Platens Stroke (Upper/Lower)	150/150	150/150	150/150	150/150	mm
Power of Plate Heaters	9	9	12	14	kW

Low- Level Handling System

To bring stacked products down to 90cm level of height for easier packing process.

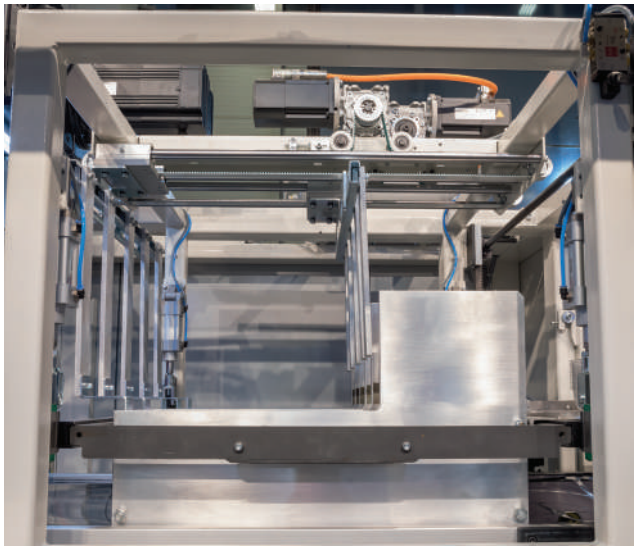
Stacker Unit

- Servomotor driven vertical stacker
- Motorised position adjustment of station with rotary encoder
- Electrical driven out conveyor
- Variable working modes

STACKER OPTIONS	Standard Stacker	Servo A-B Stacker	Standard Stacker & Down Stacking	Fast Robot Stacker	Fast Robot Stacker & Down Stacking	Lid Robot Stacker
Upward Stacking + Sweeping on to the out Conveyor	✓	✓	✓	✓	✓	✓
Upward Stacking with A-B or A-B-C Stacking	✓	✓	✓	✓	✓	✓
Down Stacking with Additional Conveyor System			✓		✓	
Robotic A-B or A-B-C Stacking				✓	✓	
Special Stacking for Round Parts						✓

Standard Sweeper

Sweeping the stacked and counted products from the stacker upper frame walls towards the conveyor.



Servodriven A-B Stacker & Sweeper

The alternative to the robot stacker, a specialized mechanism that allows for AB stacking within the upstacker frame walls. This mechanism utilizes a servo motor to drive the "A" product line under the "B" line. Additionally, another servomotor is employed to transfer the counted stacked products onto the conveyor. This system enables A-B or A-B-C stacking at the actual forming speeds.

Robot Stacker

The robot stacker is the most versatile option, offering multiple working modes to accommodate different stacking needs. It is an excellent choice for A-B stacking and particularly suitable for short or small products that pose challenges when held within the upper frame walls of a conventional stacker.

Classic working modes:

- Classic sweeper mode
- Classic A-B stacking mode (A-B within upstacker frame walls)

Robot working modes:

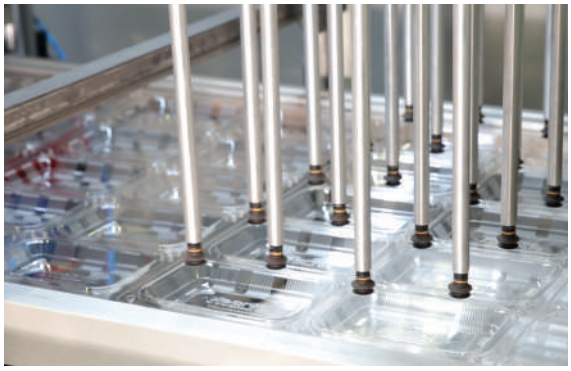
- Pick and place
- 180° A-B stacking
- 90° A-B stacking
- 2-step A-B stacking
- A-B-C stacking

Lid Robot Stacker
(with Servodriven Upper and Lower Frame)

The lid robot stacker is particularly useful when the majority of dedicated products for the machine have round cutting geometries. This system allows for better stacking capabilities, enabling the formation of taller stacks. Additionally, with the "W" cavity placements, it is possible to reduce sheet scrap ratios, further enhancing the efficiency with cavity utilization in the mould.

Working modes:

- Classic sweeper mode
- Classic A-B stacking mode (A-B within upstacker frame walls)
- Round shaped product stacking with lid robot system



Down Stacker

The down stacker is an additional feature that complements the standard upward stacking capability. It is particularly useful for stacking large and thin products, like fruit liner trays. These types of products can be challenging to hold within the upstacker frame walls. The down stacker is specifically designed to handle such products, making it well-suited for their stacking requirements.

ALL OVER THE WORLD

Trusted by industry partners in 50+ countries across 6 continents.

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