





Tray Sealer TRAVE-1000



Tool size: 330 mm wide x 1000 mm long; the number of trays per tool is calculated using actual tray dimensions and tray orientation. Sealing tool-driving system and sealing force generator consist in a fully electro-mechanical system.

GENERAL DESCRIPTION

Tray In Feed

A belt, is receiving the trays from a previous conveyor. Trays have to arrive aligned and at a suitable distance. A smart belt will pace and group the trays, independently of the previous pitch, to prepare them to be transferred to the sealing station. These two belts can handle random feeding speed and allow the machine to remain in stand by, which is important, both for fully automated solution and for manual operations. Detection of the tray is provided by a single photo eye positioned above the travelling plane. Belts are assembled on removable structure to allow easy removal.















Tray Handling

The grouping belt is driven by an asynchronous motor together with one inverter on the first belt and a servomotor on the second belt. There is a wide range of possible settings to suit the most different applications. This system prevents tray shaking and excessive deceleration and acceleration of the product in the tray, therefore the handling of the filled tray is extremely smooth and accurate.

Trays are moved from the smart belt to the sealing station through moving arms, these arms pick up the group of filled trays from either the side. These arms are controlled by a servomotor during closing and transfer phases of the trays, whose main features are smoothness, high speed, consistency, accuracy and extremely low maintenance.















Film Unwinding and Waste Rewind

Film saving and reliable continuous run are at the base of the development of the system incorporated in this tray sealer. The reel is positioned on a cantilever shaft which is connected to a motor. The reel is pneumatically kept in place by an expandable mandrel. Film is kept in tension through several shafts, which are supported both sides to avoid any misalignment. A dancing bar keeps a constant tension on the film during the unwinding.

The film is pulled through the tool via two counter rotary rollers, controlled by a Servo-Motor, which allows smooth pulling to reach the maximum waste savings. A clutch controls the tension on the continuous running film waste rewind.























Sealing Station

Once the trays are positioned in the sealing tool, the lower part is raised and the sealing process starts. High sealing force and consistency of sealing parameters are critical to guarantee the same seal characteristics tray after tray. The TRAVE-1000 is equipped with a high duty system which is electromechanical. One Ball Screw is controlling the up and down movement of the sealing tool, keeping an absolute control of the tool position while moving very fast.

The sealing force can reach 8000 Kg.

Main characteristics of this solution are smoothness, high speed, very high consistency in sealing force, very high accuracy in positioning and extremely low maintenance.



Tooling

Each tray foot print has its own tool, but different tray heights are handled in the same tool. The construction is completely in anodised aluminium and all parts are machined from a single piece to reach the best accuracy in sealing pressure distribution. Each tray cavity supports the base of the sealing edge with a T section gasket to recover from different thickness in the packaging material. The location of the tray is as accurate as possible, due to tray size consistency, to reach the best results in seal location and film trimming. Sealing plates are made of aluminium-bronze, to keep the sealing temperature consistent in all contact points, the sealing profile varies according to the specific packaging material, it also contributes to remove contamination from the sealing area. Heating is provided by an element cast into aluminium. This solution provides a long lasting heater plate and a very accurate sealing temperature control: plus or minus five degrees between each point.

Out Feed

A Polycord belt takes the sealed trays out of the machine in a straight line. Driven using a drum motor.









Wash Down Capabilities

Clean ability and resistance to continuous wash down is one of the main characteristic of this machine. In-feed belts are assembled on a removable structure.

Hygiene Design

- Avoidance of contact between extended flat surfaces.
- ➢ No closed cavities which can trap water and dirt.
- Enclosed motor.
- No sensors below travelling plane.
- Reduction of exposed nuts and bolts to increase easy cleanable surface.
- > One main electrical cabinet and one main mechanical cabinet.

Food Grade materials

- Stainless steel for main body.
- Anodised aluminium tool.
- Belts in polyurethane.

IP Rate

- ▶ IP 65 mechanical cabinet.
- ▶ IP 65 electrical cabinet.
- ▶ IP 65 pneumatic and services cabinet.
- ▶ IP 67 control panel.
- ▶ IP 67 control switches.
- ▶ IP 67 photo eyes with quick release for quick substitution.
- ▶ IP 67 proximity sensors with quick release for quick substitution.

Operations

Start, Stop, Stand By, Reset, Dry Cycling are simply controlled with standard and user friendly switches. All other settings are controlled via PLC panel control. In this way the operators are free to use the machine without the risk of changing parameters which can jeopardize the efficiency. The list of parameters which are menu driven are:

- Chain conveyor (optional) speed.
- Sealing Temperature.
- Sealing Time.
- Vacuum Time (optional).
- ➢ Gas Time (optional).
- ➢ Film Unwinding Speed.
- ▶ Length of film, by time.
- Distance and grouping speed on infeed.

All previous parameters are stored into recipes to allow an easy and fast change over. Increased list of parameters are due for automatic lines.















Change Over

A full change over of the tray sealer can be done in **10 minutes**. All parameters are menu driven, in this way the skill requirement is very low. Both bottom and top tool slide out of the chassis of the machine. The top and the bottom tool are locked and unlocked through a pneumatic quick release system. No lifting is required by the operators.

Performances

The product and the packaging material will determine exactly the cycle time. However, as a reference, we consider the following table of cycles per minutes.

Type of Product	Heat Seal	Pre Cut Lid	V&G O2 < 1%	G Closure	L Closure
Solid	17	15	12,5	17	16
Liquid	10	10	8	10	10

Mechanical Specifications

- Electrical Motors: Coel and Lenze
- Servo Motor: Lenze
- ➢ Gear Box: STM and Lenze
- Drum motor: Interrol
- Belts: Habasit

Pneumatic Specifications

➢ Metalwork

Health and Safety

The machine is CE marked and comes with declaration of conformity.













	Mondini Standard	
Switchgear cabinet	Irinox	
Plug sockets (auxiliary v.220)	Schuko	
Main switches	Merlin Gerin/Schneider	
Push button ,Selector 22.5mm	Telemecanique/ Schneider	
Signal lamp 22.5 mm	Telemecanique/ Schneider	
Interface relay	Phoenix/Omron	
Emergency stop safety relay	Telemecanique/ Schneider	
Feeding device 24 v.dc	Telemecanique/ Schneider	
Protective relay for motor	Telemecanique/ Schneider	
Frequency converter	Lenze	
Terminals	Phoenix	
Temperature controller	Lenze	
Bus system	Ethercat	
Axis communication	Ethercat	
Multi-polar plug connectors	Ilme	
Opto-electronic sensor	Wenglor	
Proximity switch	Telemecanique/ Schneider	
Safety switch	Telemecanique/ Schneider	
Temperature sensor	PT 100	
Acoustic alarm units	Telemecanique/ Schneider	
Signal tower	Telemecanique/ Schneider	
Plc	Lenze / CPU	
Operator panel	B&R / Mondini	
Axis control	Lenze	
Axis motor	Lenze	

Electrical Specifications

Driving Unit Per Item

Infeed belt	AC motor with variable speed controlled by panel
Grouping belt	Servo Motor
Exit belt	AC motor with variable speed controlled by panel
Arms translation	Servo Motor
Arms closure	Servo Motor
Tool lifting movement	Servo Motor
Film feeding	Servo Motor
Reel unwinding	AC motor with variable speed controlled by panel
Scrape collection	AC motor
Deviator belt	NA
Deviator	NA
Combiner	NA

Asynchronous motor	AC motor
Not applicable	NA









 $\sum_{i=1}^{i}$







TRAY SEALER OPTIONS

Vacuum & Gas

This option allows the production of modified atmosphere packs. It includes:

- ≻ Vacuum Pump: Busch 300 m3.
- ► Vacuum hoses and valves Gemu.
- ≻Gas reservoir.
- ≻Gas hoses and valves.
- ➤Vacuum and Gas tool. The vacuum chamber is machine out of a single piece of aluminum to reduce the risk of leakage. Also all seal are lip seals type and grease with vacuum type grease. The minimum pressure reachable is below 4 mbar. These results are important to decrease oxygen residuals and to increase productivity.
- > PLC software.

Anti-explosion pump

It is mandatory whenever using high oxygen flows or gas mixing and the machine is sold with a vacuum pump.

High oxygen protection

All the vacuum valves and gas valves are provided with proximity sensor for positive detection of status (open and closed). A PLC which is separate from the main one checks that the vacuum and gas system is working properly for each cycle, avoiding a flow of missing gas to the vacuum pump. In case of malfunctioning the machine detects it and goes in a state of alarm.

<u>Note</u>: this system is not certified and it will be totally under the responsibility of the end user to be provided with suitable pumps for the type of product to be packed.

Pressure Transducer

The vacuum and gas cycle is controlled through timers but the pressure transducer will detect the level of the millibar at the end of the vacuum cycle and the gas cycle. If the readings are not between the boundaries pre-set in the recipe, the machine will go into an alarm mode. Also with the specific menu the machine will close the tool, pull the vacuum to the maximum level and then hold it. Through the readings again it is possible to see any leakages in the tool.

Moreover this system allow to keep the volume of the gas inside the trays constant in every tray by means of a special cycle already included in the machine, even if the volume of the product inside the trays is different from each other.













Skin Application

This option allows the production of skin packs. It includes:

- Group of special extra valves.
- A variation to the film unwinding system at the tool in-feed.
- Film pre-heating system complete with the electrical parts suitable for receiving the two additional resistors.

Skin Super Protruding Application

This option allows the production of skin Super Protruding packs. It includes:

- Skin Predisposition
- Clamping Predisposition
- Heating shuttle system
- Water cooling system for the sealing plate of both the upper and the bottom tool.

Mirabella Application

This option allows the production of Mirabella solution validated by Cryovac. The Mirabella application required an additional roll for the film separation on the machine.

Pre Cut Lid

A shuttle system allows the machine to pick pre cut lids from the side magazine located on the side of the tool. This option includes:

- Shuttle structure.
- ➢ Vacuum generator.
- Hoses and electro valves.
- ➤ Tool with side magazine.
- PLC software.















Photocell Device For Tray Position Checking System

To avoid of the tray crash during the sealing phase.

Automatic Lubrication

Automatic pumping system connected to the PLC at a certain amount of cycles. The system will pump the grease. A cycle counter will remind the operator when to grease the machine.

Each point has its own micro pump with predetermined volume of grease.

Auto diagnostic, if a line is obstructed the machine flags it.



Liquid Separator

Special barrier filter located between the vacuum pipe on the exit of the machine and the point of connection with the vacuum pump suitable to protect the pump from damage.















Double Reel

A second support, including its motor, is installed on the tray sealer. Useful to accelerate the process of reel change.

Automatic Reel Change

This option reduces down time due to reel changing and reel change over. The film remains constantly engaged in the unwinding system. The system includes:

- > Two motorized reel supports.
- Automatic splashing device.
- > Extended guarding.
- > PLC software.

Once one reel is finished the film from the new reel is compressed to the last part of the old one. A double adhesive tape connects the two. The machine automatically stops the infeed to run one film unwinding cycle to pass the splice tape position through the machine before re-start automatically.

Printed Film Registration

A photo eye detects the marking log on the printed film and stops it in the right position to have the printed centred on the tray. An accurate film lay out is provided for each tool to allow a proper film printing.

















Inlet Rotation Device

Extra belt, of a total length of about 1,5 meters, suitable for rotating the trays which arrive shortedge leading to the sealing station inlet to longedge leading. The rotation is carried out through the impact of the trays against a stopping device and the speed of the belt. This system can reach up to 50-55 trays per minute. However since it is a rotation that is generated by an impact, controlled by the friction and affected by the weight of the product inside the tray and by the shape of the tray itself, the feasibility of the rotation and the reachable speed will be evaluated and confirmed every time.

Realigning And Pacer Device

A gate, activated by pneumatic pistons, and controlled by photo eyes, stops the tray, re aligns it and releases it at the pace the tray sealer is set. Tray can be realigned up to a certain degree, but not excessive. The tray sealer needs to have a belt as infeed.

By-Pass Belt

By-pass belt suitable for allowing un-sealed trays to pass through the sealing station without being heat sealed. The by-pass belt is positioned in the place of the sealing tool where there are trays which have to by-pass the sealing station.

Outlet Rotation Device

Extra belt suitable for rotating the trays from longedge leading to short-edge leading after being sealed. In order to rotate the trays it is necessary to increase the distance between one tray and the other. Therefore the system is made of a double polycord which is controlled by two servomotors suitable for spacing the trays. Once the trays have been spaced they run into a lateral guide and they rotate.















TOOLING & TOOL OPTIONS

Heatsealing

Heatsealing tool is suitable only for heatsealing applications which comprise:

- Heat sealing
- Film cutting by means of cutting knives with out side cut application.

Vacuum & Gas

Heatsealing tool suitable for V+G applications which comprise:

- Heat sealing with V+G application
- Film cutting by means of cutting knives with out side cut application.

<u>Skin</u>

Tool dedicated to the skin application with product under the tray edge. Limitation of tray height and product height to be defined an a project basis.



PRODUCT

Skin Super Protruding

Tool dedicated to Skin Super Protruding application. Maximum overall height of the package is 90mm, tray height to be defined an a project basis.



<u>Mirabella</u>

Heatsealing tool suitable for V+G applications which comprise:

- Heat sealing with V+G application
- Film cutting by means of cutting knives with out side cut with Mirabella application.















Pre Cut Lid

Lids are stored on the side of the tool. A pick and place removes the lids from the base of the pile, or the piles, via suction cups, then positions the lid on the sealing profiles. Suction cups retain the lid in position. To use this tool the machine has to be predisposed with the pre cut lid shuttle.

Inside Cut

This option allows the tool to cut the film inside of the perimeter of the tray. Such solution can be used to:

- > Avoid film protruding the edge of the tray.
- To run cups or trays with protrusions or handles from round sealing profile, without need of keeping them aligned.
- > To seal special tray with sealing surface below the maximum height of the tray.

No predisposal is required.

Alum Foil Crimping

This tool cuts a lid from a reel of aluminium and crimps it around the tray. The aluminium has to be at least 40 micron thickness. No predisposal is required.

Pre Cut Lid Crimping

Pre shaped lids are stored in a side magazine. A pick and place system removes the lids from the base of the pile, or the piles, via suction cups, then positions the lid on the sealing profiles. Suction cups retain the lid in positions. To use this tool the machine has to be predisposed with the pre cut lid shuttle.

Double heater plate

In case of aluminium tray, to decrease the required sealing time and to reduce the sealing temperature, which damages the lid, a second heater plate is positioned in the bottom part of the tool. Sealing profile is heated from the top and the bottom, sealing time is reduced by half the time compared to a standard solution. A water cooled bottom plate avoids the transfer of the heat to the main machine body. The machine has to be predisposed to run two independent heater plates.















<u>Extra Equipment</u>

Tool Trolley

Positioned to the side of the tray sealer, assembled on wheels and locked in position, the bottom and top tool can be transferred into the trolley very easily. The top tool is automatically secured in position once the trolley is unlocked from the tray sealer. Now the trolley can be taken to the maintenance area. The top tool can be rotated upside down through a gear box helping a lot cleaning and maintenance. Stainless steel construction.

Hidraulical Tool Trolley

Compared to the standard trolley, it has an hydraulic levelling system.

For this reason it can be adaptable in height to the different TRAVE and to the tool racks avoiding to act on handlewheels.

Tool Rack

To easy accommodate the different tools a tool rack, in stainless steel, is available. Can also be equipped with wheels or pre heating station.



Pre-Heating Device

To guarantee the extra tool ready to work before the tool change over.













