



# G. MONDINI SpA

**DOSATRICI-CONFEZIONATRICI AUTOMATICHE**



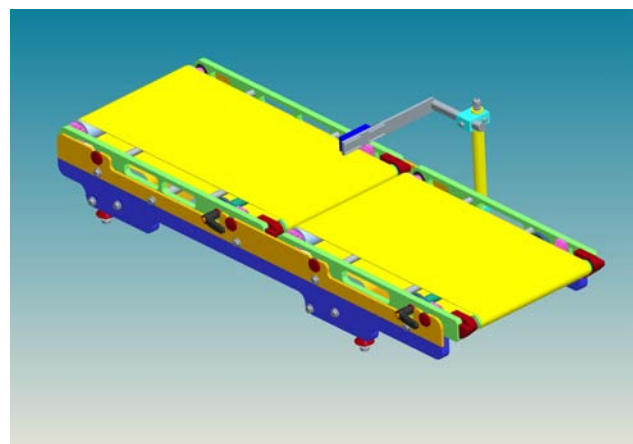
## Tray Sealer Evoluzione E-350

Tool sizes are 340mm in width and 570 in length. Sealing tool-driving system and sealing force generator consist in a fully electro-mechanical system.

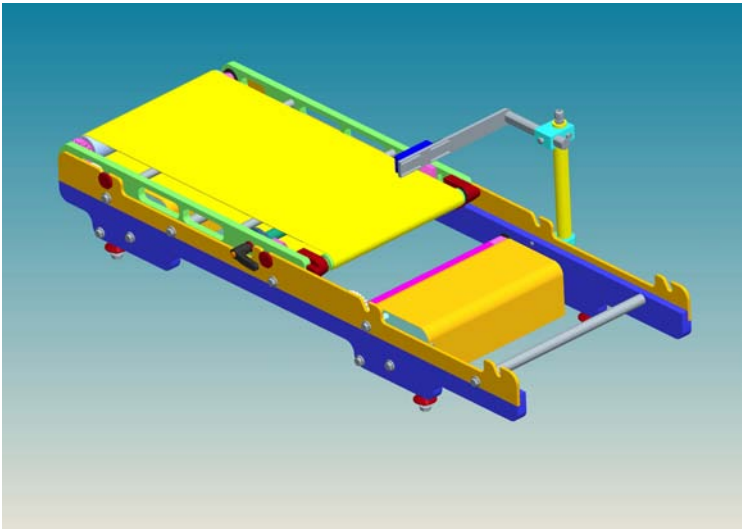
### General description.

#### Tray in feed.

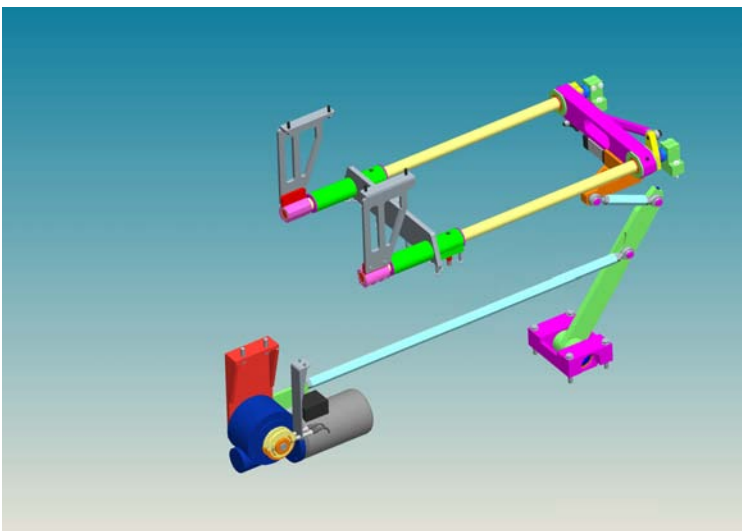
A flat belt conveyor receive trays coming randomly spaced. The photo-eye detects and records the arrival of the trays in such a way that the machine remains in stand-by till the proper number of trays per cycle are in the right position.



Tray handling.



To avoid tray shaking and excessive deceleration and acceleration of the product inside the tray, the handling is extremely smooth and accurate. For cleaning purposes each belt can be easily removed without the use of tooling.



Trays are moved from the grouping belt to the sealing station through moving arms, which are gripping the group from the side. These arms are controlled by a electro-mechanical system, whose main characteristics are smoothness, high speed, consistency, accuracy and extremely low maintenance and by a long-stroke pneumatic piston for the rotation to allow a very good smoothness and a wide range of settings.

Film unwinding and waste rewind.

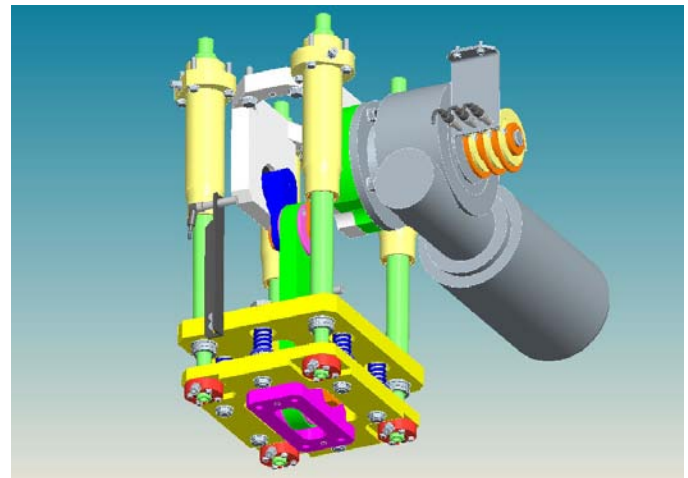
Film saving and reliable continuous run are at the base of the development of the system incorporated in this tray sealer. The reel is positioned on a cantilever shaft which is connected to a motor. Film is kept in tension through several shafts, which are supported both sides to avoid any misalignment. 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 an electrical 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 Evoluzione is equipped with a high duty system which is of an electromechanical type. A rod-crank system is controlling the motion up and down of the sealing tool, keeping an absolute control of the tool position while still very fast. The sealing force can reach 2000 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.



Out feed.

A drum motor takes the sealed trays out of the guarding in a straight line.

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.

**Wash Down capabilities.**

Clean ability and resistance to continuous wash down is one of the main characteristic of this machine. Both the mechanical and the electrical cabinet are totally sealed and built in such a way that trapping points are reduced at minimum.



### Hygiene Design.

- Avoidance of contact between extended flat surfaces.
- No closed cavities which can trap water and dirt.
- 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 and some holding elements for the machine.
- Belts in polyurethane.

### IP Rate.

- IP 65 mechanical cabinet.
- IP 65 electrical cabinet.
- IP 65 pneumatic and services cabinet.
- IP 67 PLC 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.

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 **ten 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.

## **Maintenance.**

Being mainly a mechanical machine, all bearings, bushing, shaft etc need to be greased regularly. A centralized lubrication system distributes the grease to all critical points. Each tool has its own greasing point.

## **Mechanical Specifications.**

- Electrical Motors: Coels.
- Servo Motor: Lenze. (optional)
- Gear Box: STM.
- Mechanical speed variator: Motovario.
- Drum motor: Interrol Joki
- Belts: Habasit

## **Pneumatic Specifications.**

- Metalwork



**Electrical Specifications.**

	MONDINI Standard	Eventually on plc Allan Bradley
Switchgear cabinet	Irinox	
Plug sockets (auxiliary v.220)	Schuko plug	
Main switches	Merlin Gerin	
Push button ,Selector 22.5mm	Telemecanique	
Signal lamp 22.5 mm	Telemecanique	
Interface relay	Phoenix	
Emergency stop safety relay	Telemecanique	
Feeding device 24 v.dc	Switching feeder Eurotek	
Protective relay for motor	Telemecanique	
Frequency converter	Lenze	
Terminals	Phoenix	
Temperature controller	Plc controlled	
Bus system For axis communication	Profibus	Device-net
Multi-polar plug connectors	Ilme	
Opto-electronic sensor	Wenglor	
Proximity swicht	Telemecanique m08,m12,m18 with connector	
Safety swicht	Telemecanique magnetic Schermsal non magnetic type	
Temperature sensor	Pt 100	
Acoustic alarm units	Telemecanique	
Signal tower	Telemecanique	
Plc	-Siemens Touch S7	-Allan Bradley Compact logix
Operator panel	Siemens Touch	
Axis control	Lenze	
Axis motor	Lenze	

**Health and safety.**

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



## Tray sealer options

### Anti-explosion pump

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

### Automatic lubrication

Automatic pumping system connected to the PLC. By pressing a button on the touch screen the system will automatically pump the grease.

A cycle counter will remind the operator when to grease the machine.

### Continuous Film Waste Suction system

A Multicutter collects the film waste and cuts it. A hose connect to the exit of the Multicutter sucks away the waste, which can be conveyed several meters away, out of the production area.

### 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.

**Note: 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.**

### 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.



## **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 a state of alarm. 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.

## **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.

## **Vacuum & Gas**

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

- Vacuum Pump: Busch 300 m3.
- Vacuum hoses and valves Joucomatic
- 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.

## **Tooling & tool options**

### **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 position 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 positioned 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.

**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.



## Extra Equipment.

### 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 up-side down through a gear box helping a lot cleaning and maintenance. Stainless steel construction.



### 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.

### Tray Denester.

A wide range of denesters are available to suit different needs. As a standard option we propose an inclined pile system actuated by the chain conveyor. A cam synchronizes the phase between the denester and the chain motion. Suction cups, with a Venturi vacuum generator, are denesting trays from the bottom of the pile. Change over is in less then five minutes and does not require tools. A chain conveyor is mandatory.



## **Chain Conveyor.**

General Description. Stainless steel construction in AISI 304. All TIG welding. Easy cleanable design:

- Avoidance of contact between extended flat surfaces.
- No closed cavities which can trap water and dirt.
- Reduction of exposed nuts and bolts to increase easy cleanable surface.
- Main chassis structure with flat surfaces 45° degrees to allow water flowing.

## **Chain Conveyor dual chain option**

Two chains are supporting the tray; legs are keeping in position the tray but not pushing them. This solution acts as belt conveyor. Benefits:

- Avoidance of friction in the bottom of the trays, which could lay to damages or dirt collection.
- Better alignment in case of difficult container shapes.

## **Intermittent motion.**

Several options are available to have an intermittent motion conveyor:

- Self-brake motor. Can run continuously, variable speed, or intermittent. Parameters are variable and controlled via PLC. Accuracy of stop position in the order of 5-10 millimeters.
- Gear box. Can only run intermittently. Very accurate in positioning. Output can be changed via PLC, but pause-motion ratio is fixed.
- Servo drive. Maximum flexibility and accuracy via PLC.

## **In line Washing.**

In a closed stainless still box, where the chain has a downward and an upward movement, nozzles are injecting water from several directions. Used water is collected and conveyed to drain.

