



IN-LINE THERMOFORMING MACHINES

Complete turn key IN-LINE installations

from material handling through to boxing units of finished products

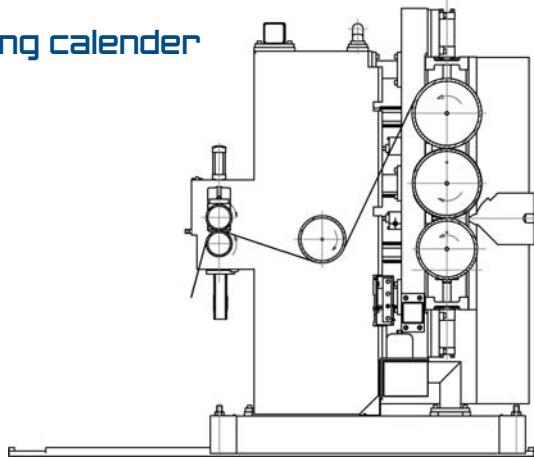
WM WRAPPING
MACHINERY
SWITZERLAND

More than just fast: **Reliable**

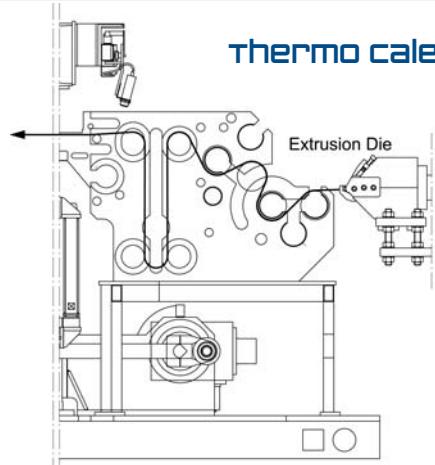
the IN LINE process

IN LINE technology is a "closed loop thermoforming process", a complete turn key installation from raw material handling through to boxing of finished products.

laminating calender



thermo calender



The in line plant represents the ideal solution for high output with the lowest material consumption, reduced energy, minimum labour requirements and best utilisation of space.

The line starts with the extrusion group. In the extruder hoppers the required proportion of granulated scrap and granules of virgin material is mixed before feeding the extruder.

Single screw extruders plasticize the material and a compensation pump assures a constant feed to the extruder die.

The flat die controls the thickness calibration of the extruded sheet which is fed into a temperature controlled calender.

There are two different types of calender available depending on the material to be processed: laminating calander or thermo calander.

The sheet leaves the calender and is transferred by toothed chains to the forming station.

Depending on the nature of the final product there are two possible options:

- a) forming and punching in place
- b) forming and separate trimming

The products are then counted and packed and the scrap is fed to the granulator. The granulated material is blown back to the extruder area to be reprocessed.

MAIN ADVANTAGES OF THE SYSTEM

Great advantages are offered to the end user by the IN LINE process.

IMPROVED PRODUCT QUALITY

Due to the immediate thermoforming of the extruded sheet, the characteristics of the sheet are uniform. This enables, in the following phase of thermoforming, improved mechanical and structural properties and better aesthetic appearance of the final product. Lighter formings can be produced with the same rigidity. In line technology offers the highest possible performance, especially for thin-walled products. Furthermore, the immediate recycling of the scrap prevents contamination and leads to improved quality of the product.

BETTER USE OF ENERGY

When forming, the residual temperature of the extruded sheet reduces the amount of heating required.

OPTIMISATION OF PRODUCTION OUTPUT

The down-time associated with roll changing is eliminated and there is the ability to immediately correct any problems arising in the extruded sheet with the minimum of scrap.

SPACE REDUCTION

With the in-line extruder, the winding of the sheet in to rolls is eliminated, saving all the handling time and storage requirements. The compactness of the line, the elimination of the need to store rolls of sheet and the direct reprocessing of the scrap give a marked reduction in the space required.

PERSONNEL REDUCTION

The line can be managed by one operator only. In simple words: more efficient = more economical .

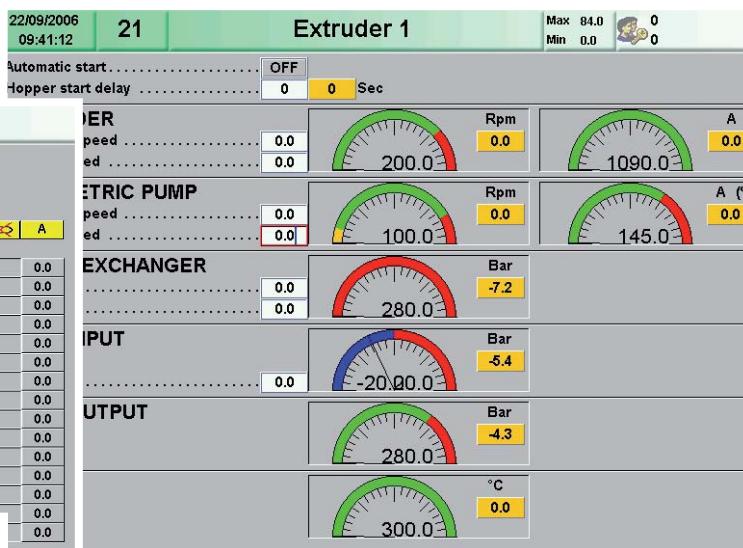
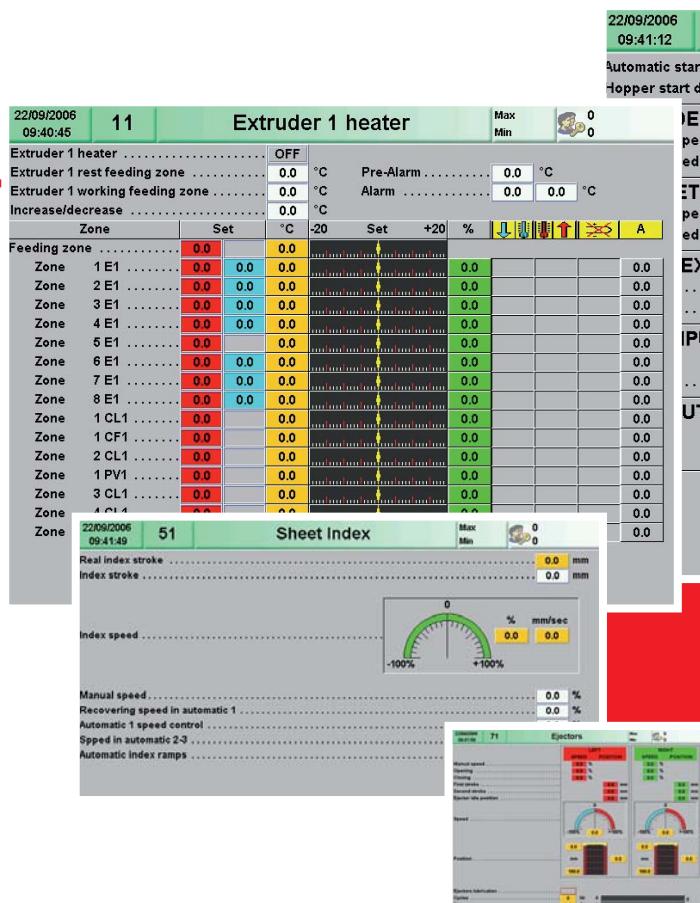
IN LINE

thermoforming system

the range

	INTEC 500	INTEC 700	INTEC 900	INTEC 1000	INTEC 1100
Main extruder diam.	80 mm	120 mm	120 mm	120 mm	150 mm
Max. capacity PS	250 kg/h	800 kg/h	800 kg/h	800 kg/h	1.000 kg/h
Max. capacity PP	215 kg/h	650 kg/h	650 kg/h	-	-
Co-extruder diam.	-	-	-	50 mm	50 mm
Max sheet width	620 mm	750 mm	910 mm	1050 mm	1050 mm
Type of calender	Laminating	Laminating	Laminating	Thermocalender	Thermocalender
Max. forming tool area	570 x 375 mm	705 x 400 mm	880 x 520 mm	1000 x 1000 mm	1010 x 800 mm
Max. trimming area	550 x 320 mm	685 x 340 mm	860 x 460 mm	960 x 960 mm	1010 x 360 mm
Forming system	Pressure	Pressure	Pressure	Vacuum only	Pressure
Forming clamping force	30.000 daN	40.000 daN	75.000 daN	40.000 daN	35.000 daN
Trimming force	-	-	-	-	20.000 daN
Note	75° tilting mould in mould trimming	75° tilting mould in mould trimming	75° tilting mould in mould trimming	For HIPS plates in-mould trimming	For HIPS cups Separate trimming
Production rate for:					
Std. 200 cc cup PP 2,6 g	46.000 pcs/h (PP)	80.000 pcs/h (PP)	120.000 pcs/h (PP)	-	-
Std. 200 cc cup PS 2,6 g	-	-	-	-	200.000 pcs/h (HIPS)
Std. 210 mm plates PS 7 g	-	-	-	35.500 pcs/h	-
Std. 210 mm plates PS 14 g	-	-	-	30.000 pcs/h	-
Std. 220 mm plates PS 16 g	-	-	-	28.000 pcs/h	-

Data listed are for indicative purpose only.



All the IN LINE plants come with **latest generation software** which provides perfect management of all the parameters and functions.

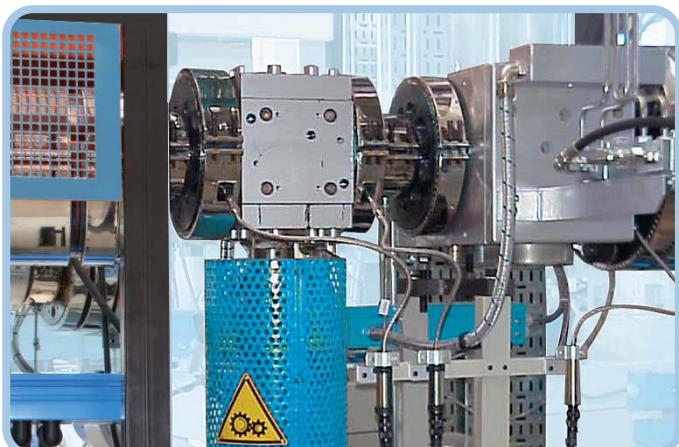
EXTRUSION group



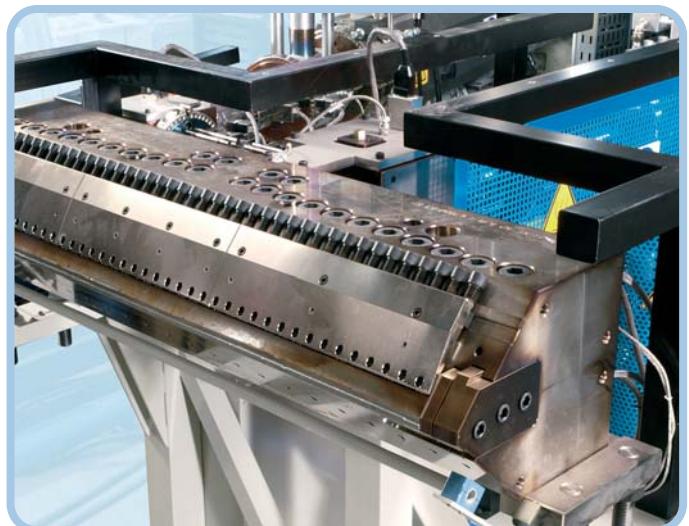
Raw material dosing-mixing feeding group.



Coextrusion configuration.



Melt gear pump.



Extrusion die head.



Vertical laminating calender and haul-off (for PP, PET, HIPS, GPPS).



Thermo calender.

MAIN CONTROL CABINET (AIR CONDITIONED)

The system is based on an extremely reliable and well tested industrial PC. A colour monitor is fitted with a soft-touch keypad, furthermore, a USB memory stick for the storage of all the data, an ETHERNET port enables the line to be connected to one or more computers via the company network and a printer connection all come as standard. There is also a modem for remote connection to facilitate any after-sales technical support.



WASTE REPROCESSING

The waste sheet is automatically fed into a grinder and the ground material is then returned automatically in line to the gravimetric dosing and mixing units over the extruder hopper.



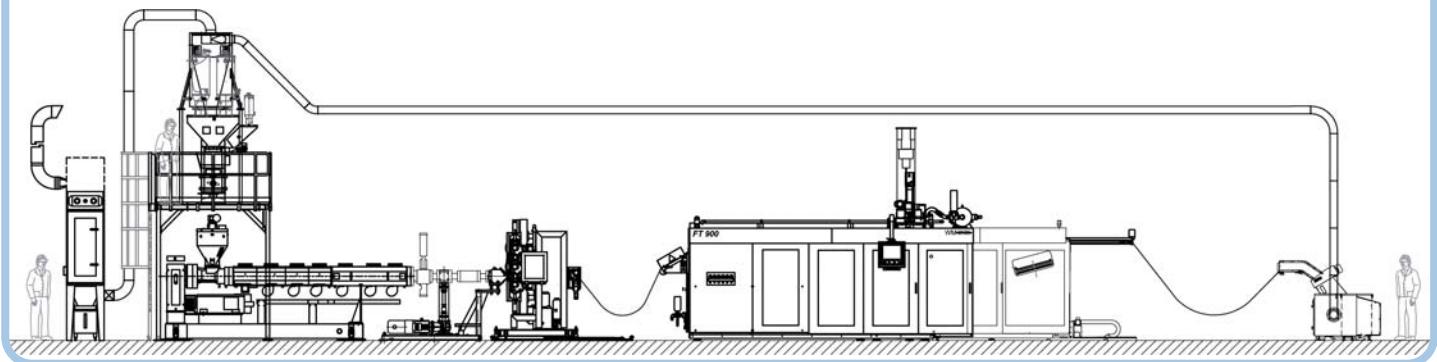
DOWNSTREAM EQUIPMENTS

According to the final product and its geometry, the line can be completed with downstream equipments as stackers, rim rolling units, counting-packaging systems.



INTEC 500-700-900

INTEC 900 for PP products (120.000 200 cc cups per hour)



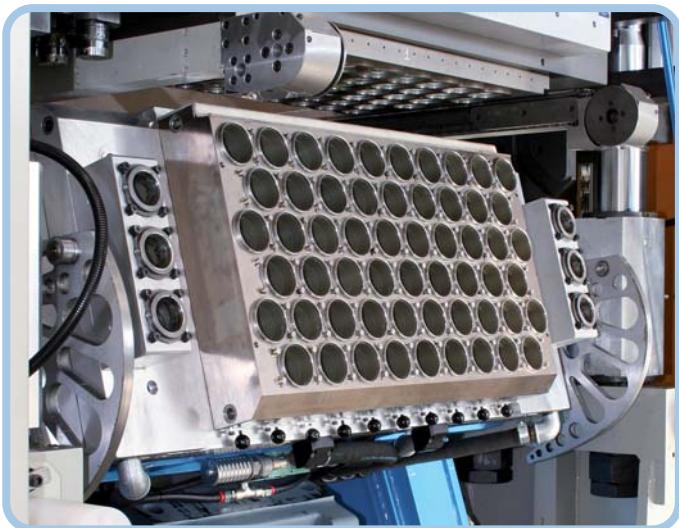
The INTEC 500 - 700 - 900 have been designed to satisfy the demands of medium and high outputs of PP and GPPS crystal disposable cups , yoghurt pots , ice-cream and margarine containers etc. Extrusion group is coupled to in-mould cut thermoforming machine which feature lower platen that rotate of 75 degrees.





The plug movement on the upper forming platen is controlled by servomotor and provides an even and controlled distribution of the material inside the mould cavities.

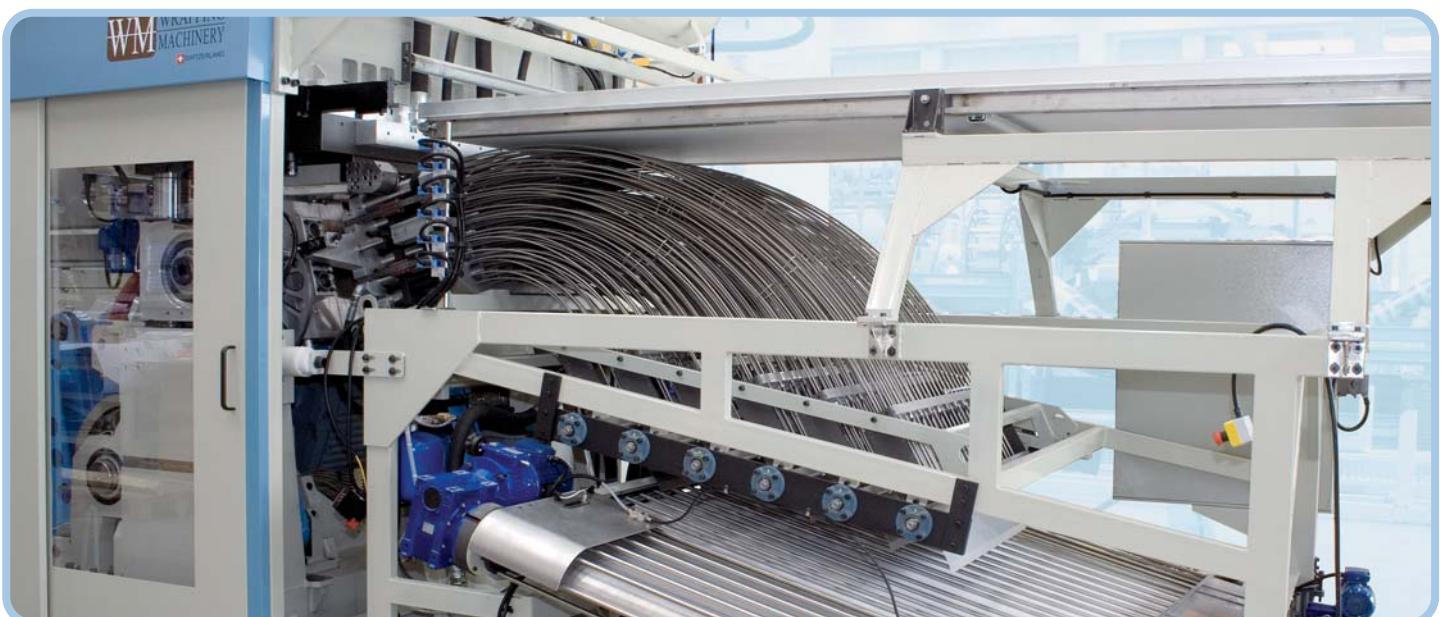
Different plug speeds and time can be programmed improving the aesthetic appearance of the products.



The lower tilting platen turns through 75 degrees permitting precise rapid ejection of the formings, which are then transported to the stacking unit.

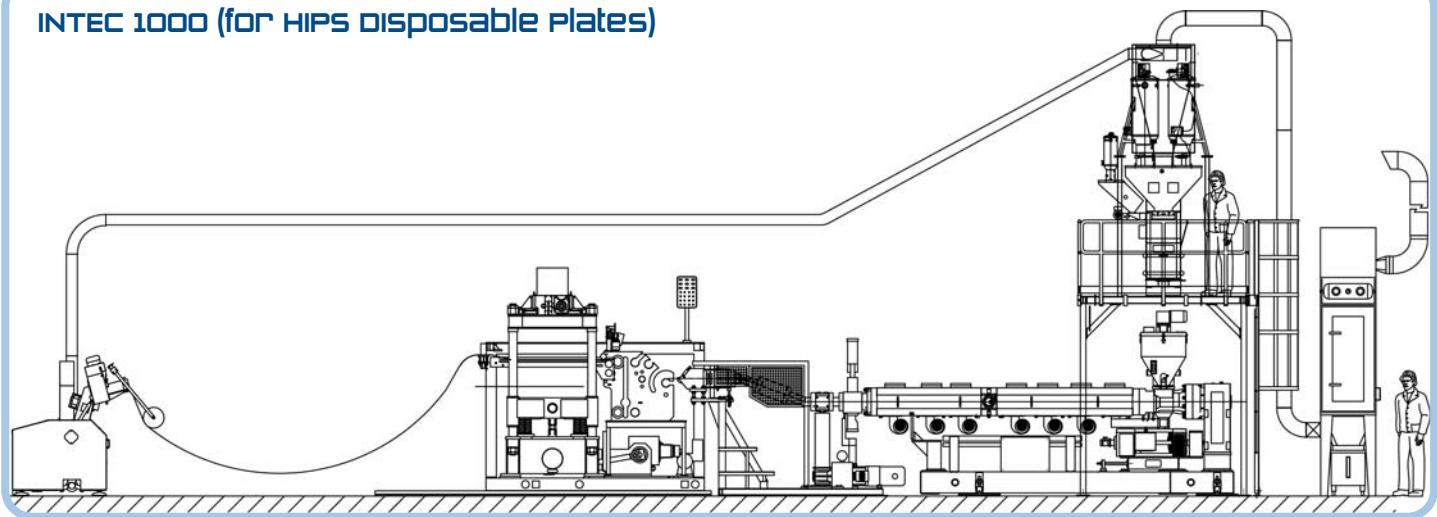
The (patent pending) pivot system uses a combination of servomotor driven cams and levers. It guarantees absolute precision of movement and repeatability and a controlled distribution of forces during the platen movement and cutting phases of the cycle.

Differentiated stacking systems are supplied to optimise the machine speed according to the size and format of the items to be produced.



INTEC 1000

INTEC 1000 (for HIPS disposable plates)

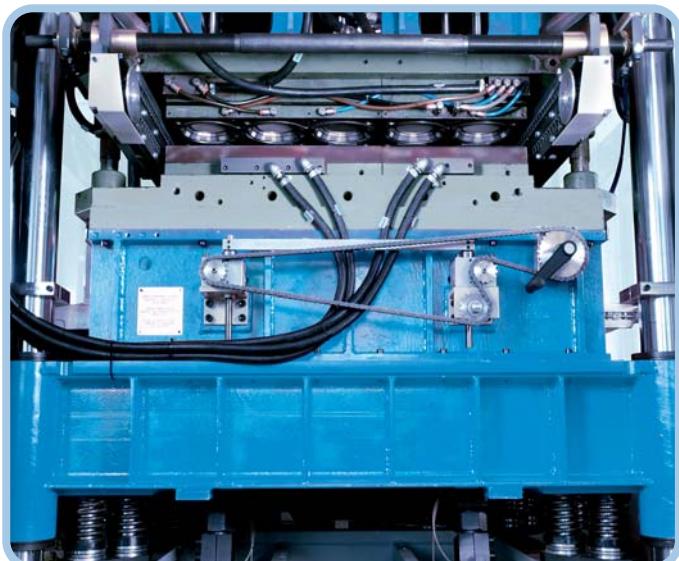


The INTEC 1000 in line plant has a production capacity of more than
35.000 HIPS plates per hour (16 cavities, 220 diameter)





Before entering the forming tool , an infrared optical reader takes the real temperature of the sheet , the reading is visualised on the screen enabling the operator to make all the necessary adjustment. The movement of the lower platen is operated by a rod-crank system driven by an electronic motor. An operator platform with push buttons panels is available for all the manual operations control. The scrap leaves the forming tool and enters the granulator.



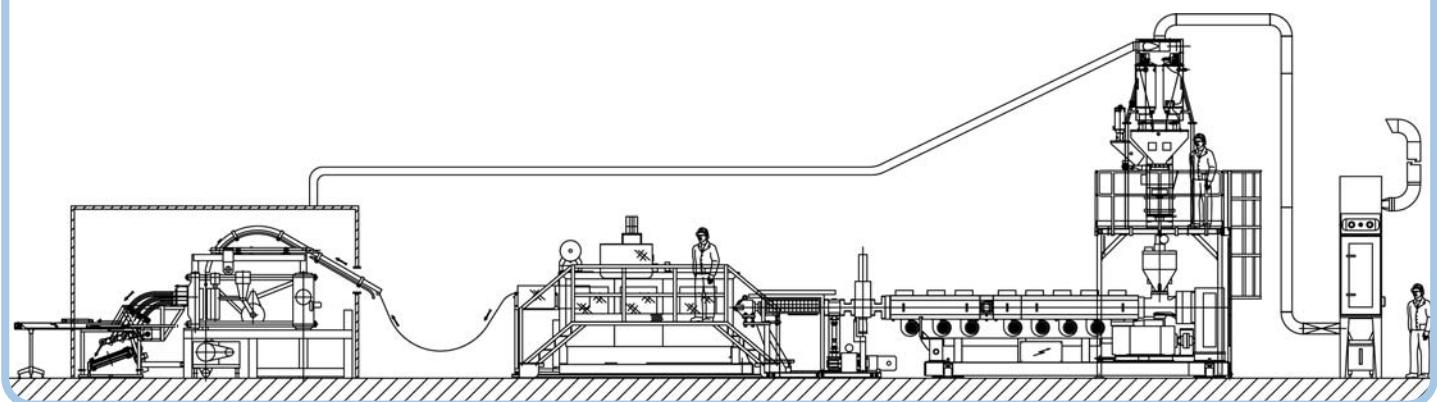
The forming station uses the in-mould punching concept and forming is obtained by vacuum only . The plates are punched down into the lower part of the tool and counted, when the wanted number have been obtained the entire piles are evacuated on a conveyor belt.



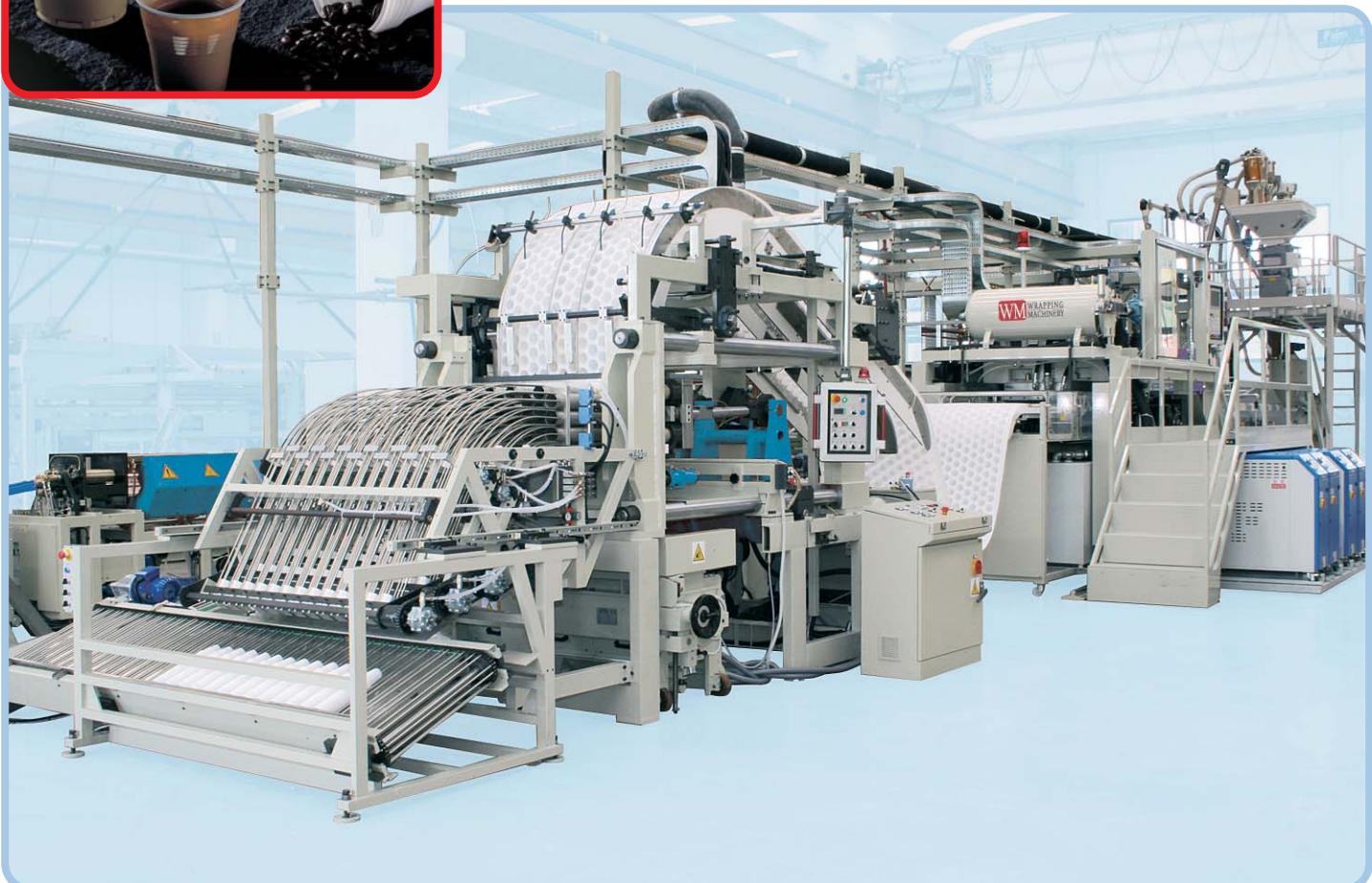
At the exit of the conveyor belt the piles of plates are transferred to the following packaging operations .

INTEC 1100

INTEC 1100 (for HIPS disposable cups)



The INTEC 1100 is dedicated to the IN LINE production of HIPS disposable cups, output rate up to **more than 200.000 pcs/hour** (200 cc). The line can be supplied with two or more extruders according to the required cups (i.e. two colours). The calender installed on the forming machine is of the thermo-conditioning type.





Before entering the forming tool , an infrared optical reader takes the real sheet temperature and the reading value is visualised on a screen. Forming unit has a lower moving platen operated by rod-crank system controlled by servomotor. On the upper fixed platen a motor driven plugging system is installed . Forming is obtained by air pressure.



The sheet with the formed cups is then transported to the horizontal trimming press . Cups are then trimmed and ejected into stacking unit while the scrap falls into the grinder installed under the trimming tool.

The ground waste is directly blown back to the dosing-mixing unit over the extruders. Line includes sound proof box over the trimming press to reduce the noise level below 83 dB.



Once cut cups are ejected into collecting channels and the piles are discharged on a conveyor system which transfers the cup piles to the rim rolling machines and consequently to the counting and packaging units.

the COMPANY



WM Wrapping Machinery SA is based in Stabio, Switzerland. Our Technical Department engineers have been designing and manufacturing thermoforming machines since 1981, and complete **IN LINE** plants since 1992.

Today the company has an established international reputation for the production of high performance and reliable machinery, processing thermoplastics worldwide. The experienced and highly qualified technical team is continuously engaged in developing new process improvements and tailor-made solutions to meet the special requirements of each customer. The very **close co-operation with our customers** is essential to ensure success and the best results. Our Technical Department offers a complete customer service package including the **transfer of 'know-how'** and **technical advice** based on practical experience and research. **Intensive training of the customers' personnel** ensures that the customer takes the maximum advantage from the capabilities of the lines and there is an **efficient and reliable after sale service**.

These are the expectations of our Customers - these are our aims.

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