

WHAT TO KNOW OF A THERMOFORMING

THE CUSTOMER HAS TO KNOW: FOR A GOOD OPERATION OF THE MACHINE.

The voltage has to be correct with a adequate cable section suitable for consumption.

For 400V.± 10%. female plug, 5 poles 32Amp., 3 phases+neutral+Earth.

For 220V.± 10%. female plug, 4 poles 32Amp., 3 phases+Earth

Compressed air network:

Able to maintain a consumption of 1000 l/min. and 6 bars of pressure.

Very important: the air must be dry.

Moist air causes damages in the pneumatic system of almost all machines.

Actually, in the market there are compressors called of screw very quiet, of high production, with air dryer, impurities filter than can be bought easily in industrial supply stores.

Water network:

Thermoforming machines are cooled by water pressure through a cooling system installed on the machine.

To connect the machine:

Must have water connection with a cock of about ½ inch. in the vicinity where the machine will be installed.

Also, should be an outlet for drainage water.

Very important: If the water has a lot of lime, it significantly impairs the cooling circuits, damaging pipes, electrovalves, check valves, etc., so, is advisable to put a water softener.

Water consumption is estimated in 1,6 m³/8 hour or 0,2 m³/hour.

There is the possibility to install a cooling closed circuit what involves installing a water tank of 500 to 1000 liters aprox., with a pressure pump of domestic use, which sends water to the thermoforming coming back again for a pipe to the tank where the room temperature is cooled.

This system is a small investment, save all the water and avoid the inconvenience of the lime in the water. It can be installed by a plumber.

REMEMBER: IF THE VOLTAGE, THE AIR NETWORK AND THE COOLING WATER HAVE DEFICIENCIES, WILL CAUSE UNNECESSARY BREAKDOWNS, MAINTENANCES AND PRODUCTION LOSSES.

THERMOFORMING: Machine which packs products in containers made in the own machine from a film coil.

ADVANCE: Is the movement in millimeters that makes each time a cycle is made.

FORMED DEPTH: Is the height wanted for a container.

ROOTS PUMP: Is the special pump which is added to the normal pump to do well and fast the vacuum to moist products.

OXYGEN PUMP: Special pump, obligatory to work with gases which oxygen percentage exceeds the 21% in it composition.

VACUUM PUMP IN FORMED: Is used in supporting the air pressure or, also, to products which could be contaminated by the compressed air.

AUTOGREASE: Optional device, placed in the machine and, which do the greasing by an automatic way. Will spent less time to the maintenance with that option.

SKIN OPTION FROM CONTAINER LEVEL: Machine preparation to work with skin system if the product does not exceed the height of the container edge.

SKIN OPTION OVER CONTAINER LEVEL: Preparación de la máquina para poder hacer el sistema skin cuando el producto sobresalga en altura por encima del borde del envase.

PREHEATINGS: Devices which help to heat the rigid film, soften it so that when the formed form comes in can make the container well and fast.

HELPING MALE: Metal device with the container shape which forces the film to take shape, getting better distribution of the film thickness across the container surface. or reparto del espesor del film en toda la superficie del envase.

SECOND PROGRESS OPTION: Normally the machines are made with a only one progress which can be split in multiples containers. If it is totally indispensable necessary that other container does not coincide with the divisions of the first progress, it is possible to make a second one in the own machine; the mold is more expensive and more cumbersome to change, but give the solution.

FORMATS: Refers to de different molds that can be attached to the machine in a same progress.

Is possible to do it without an easy-open, with an only one easy-open corner or up to four corner the container has.

HEIGHT TEMPLATES: Are aluminium supplements which are placed under the formed plates to vary the different container heights in a very small containers. Normally, the height steps have to be small, so will use templates or wedges with a thickness thin. Neccesarily must be of aluminium because, also work as coolers.

TRANSVERSAL CUTTERS: That kind of cutters do the transversal cuts of the film, that is, by the width of the film.

When the format wanted to work, has a transversal division in the drawer, there is the inconvenience of having to make two cuts in a same cycle of progress.

For that, there are two solutions:

1°. With a transversal cut, only selecting the party advance in the machine, it would stop in the middle of the drawer to do a second cut. Only has the inconvenience of a minor production because decrease the cycle numbers per minute.

2°. Equip the machine with a second transversal cut which will make the two cuts at the same time without stopping, and does not reduce the production or output.

USE A DOUBLE CUT WITH FLEXIBLE FILM DOES NOT INVOLVE TO MUCH IN THE SECOND DIE COST, BUT IN THE CASE OF RIGID FILM IT WILL BE SO MUCH MORE EXPENSIVE.

ROUND EDGES RIGID DIE: High pressure die to coin the rigid film the way the containers have round edges. If this containers do not have round edges may cause injuries.

REEL HOLDER: Is the placement where is set the combination of blades and starts which make the cut and round edges to the containers in a same format.

CIRCULARS BLADES CUTTING AXLES: Until now the containers have cutted by lots a same formed and sealed drawer. With the longitudinal cut will separate by individual way all containers.

Formats (1x1 y 1x2) can be compatible with a same cutter axle.

Also (2x1 y 2x2) compatibles with the same axle.

(3x1 y 3x2) compatibles with the same axle.

(4x1 y 4x2) compatibles with the same axle.

VACUUM PUMP EXTERNAL SUPPORT: Normally the machines have an internal space for 100 ó 160 m³/hour pumps, depending on the machine size. In the case of put the bigger pump, it is necessary to put the external pumps far from the machine. The pump should be placed in a anti vibration system support; which are called external support.

OPERATION: We start from a lower film coil.

The film is carried by clamps between two chains unti the formed area. There is heated and pushed against a mold where the container is formed; once cooled, goes to the loading zone to fill it with product.

Then, goes to the vacuum area with a top film layer placed on top to seal, start the vacuum-gas and sealing process of the two sheets. Once sealed, goes to the transversal cut taking out in one or two lots, all the containers of a same cycle.

Then, the longitudinal cut is done and the containers are separated individually. During the route and after filling the products, is possible to insert labeled service, printing, etc.

FLEXIBLE FILM: Is considered flexible film if the thickness of it does not exceed the 300 microns, that means, 0.3 mm.

Usually is used for vacuum containers, being the film crushed against the product. Also, is possible to use with gas inside the container, being with little stiffness but with the product proper. Can be formed with the shape and measures of any product.

SEMI-RIGID FILM: Is considered semi-rigid film if the thickness is between 300-500 microns, that means, 0.3-0.5 mm.

That film is useful to thickness gas containers with tray shape. Can be formed with the shape and the measures of any product.

Should bear in mind that when bigger the depth is, the container bottom is weaker. Usually, is recommended for 0 to 50 mm of depth. The container stiffness depends on the type of film used (consult with film manufacturer).

RIGID FILM: Is considered rigid film if the thickness exceed the 500 microns, that means, 0.5 mm.

With this film will get more consistency and depth.

Should bear in mind than when bigger the depth is, more equipped the machine has to be of heating and preheating power to maintain the output.

IF THE CUSTOMER KNOWS CLEARLY WHAT ARE GOING TO PACK AS TO FORM AND DEPTH MEASURES, CAN REQUIRE TO FRIMAQ DESIGNER, THE FASTER MOLD CHANGE SYSTEM FOR THAT FORMAT.

VACUUM SPEED: Depends on:

- The vacuum pump volume engaged for the machine.
- The temperature of the product to pack.
- The product moisture.

PRODUCTION SPEED: The machines are designed electronically and mechanically to do 11 cycles/minute with the vacuum-sealing complet process in the better conditions.

The speed depends on:

- The vacuum power (pump)
- Sealing time (depend on the film type)
- Formed time (depend on the film type and the preheating equipment engaged)
- Chains speed (depend on the product. Ex: liquids)

SKIN PACKAGING: Vacuum packaging system, which once is made the vacuum to the product, pressing the film against the product, it takes the shape; appear then a second skin. That system does not extract the juices out, so keep a better presence and higher durability.

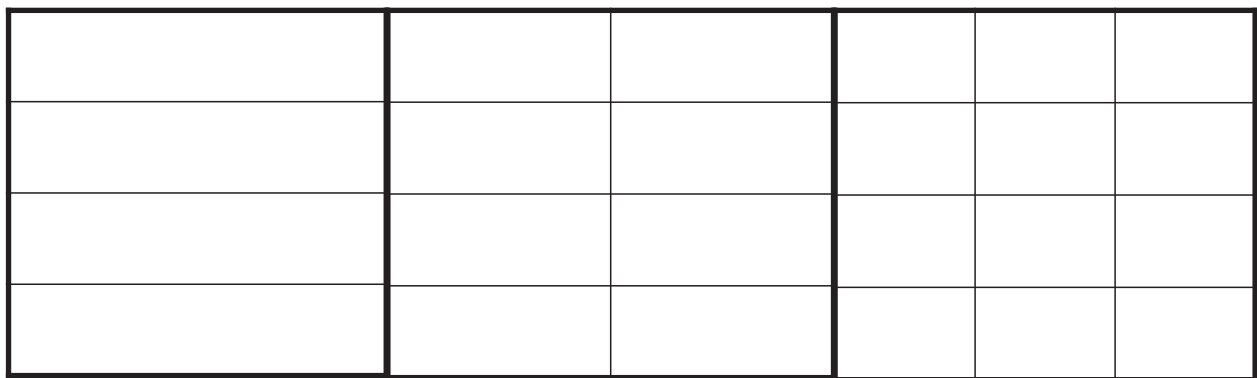
DIVIDED ADVANCE x1 x2 x3: The machine advance always as the same way, depending on the predetermine mesure, and always finish an advance, makes a transversal cut. If the mold format has welding in the middle of the route, the machine has to be stopped in the welding zone to make the corresponding cut. This stops are called divided advance. Normally are made by one or two, and exceptionally, by three, but the machine has the possibility.

The divided advance allows to make three cuts in a same advance.

Advantages:

- We save the assembly of two or three transversal cut groups.
- The machine can be shorter.

Each cut mechanism increases the machine length in an advance length.



Avance x1: 300mm

Avance x2: 150mm/150mm

Avance x3: 100mm/100mm/100mm

Cuchilla de corte

Disadvantages:

- Reduce a little the production because it has to stop to make the cuts.

If we choose to mount the mechanism of each cut:

Advantages: The production speed does not decrease.

Disadvantages: More length in the machine, more investment.

VACUUM AND GAS BY INJECTION CANNULAE SYSTEM: The system works as follows:

A perforation has done in the laterals of the lower film in the formed area. These holes move towards the vacuum area where the cannula enters through the lower film and pushing the top film some milimeters to separate it from the lower. At this time, the vacuum and the gas entry are done which are scheluded for gas. With that system prevent a welding plate and the lower drawer with dirtiness.