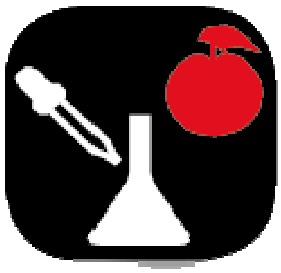
DE LORENZO S.p.A.

FOOD TECHNOLOGY

Individual machines or complete systems for small production units



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INTRODUCTION

In this section we are pleased to present an example of a complete line for fruit and vegetable processing.

The line can be summarized in its basic concepts by means of the following chart that identifies the main processes to obtain fruit cream and juices (lines A1 and A2) and, starting from them, both jams, marmalades, ketchup and concentrated fruit (line A3) and fruit juices or nectars line A4).

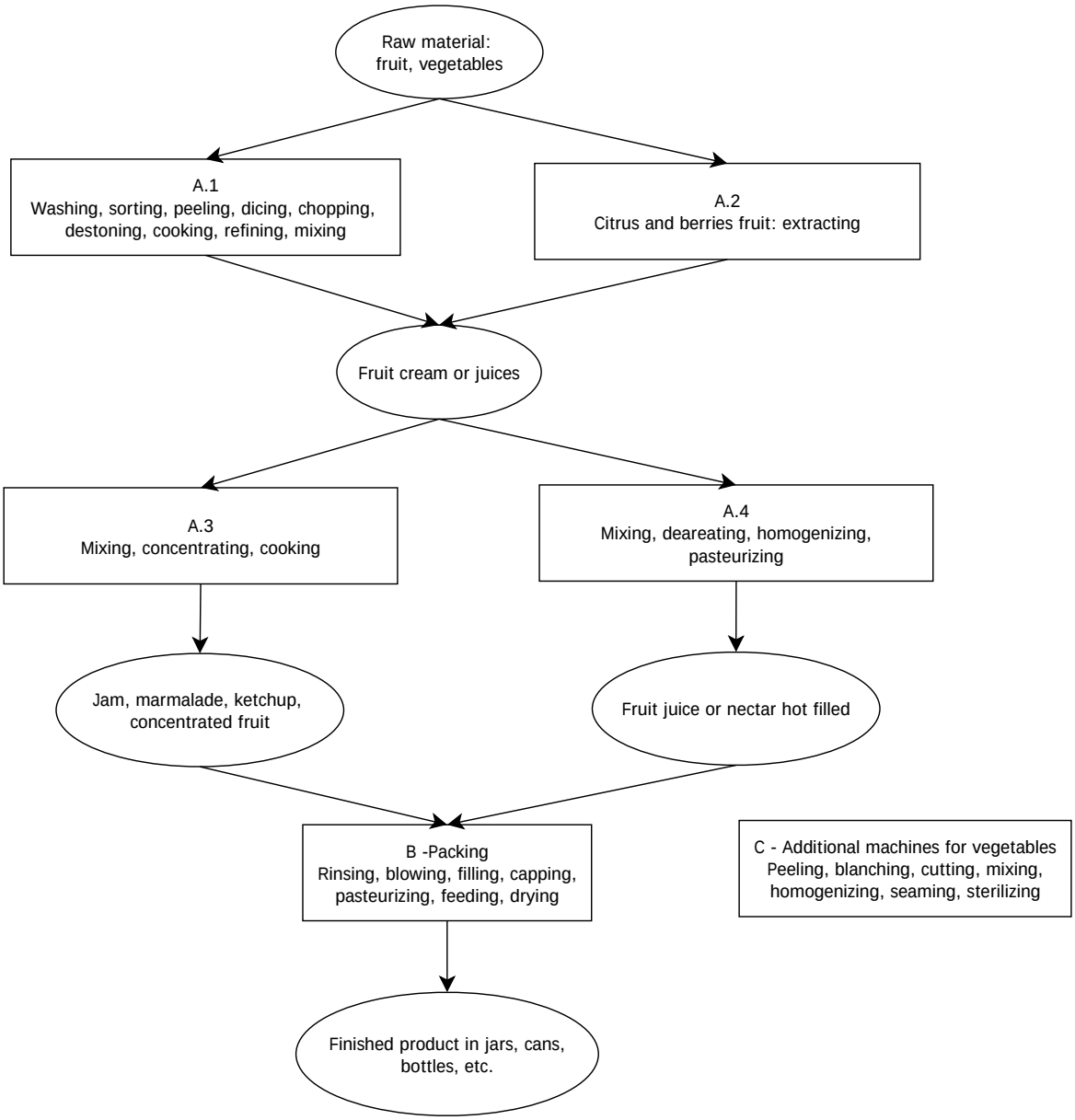
In line E you will find a special plant to obtain candied fruit.

Line C lists a number of additional machines for peeling, blanching, cutting, mixing, etc. vegetables, while a special section is dedicated to filling, capping and labelling, in bottles, cans and jars (line B).

Line D deals with services such as: water cooling, cold storage rooms and food freezing.

Finally, in line F we have introduced a complete, but compact system for the preparation of different types of food. The heart of the plant is a multifunction machine that is, at the same time, a cooking unit, a dosing unit and a pasteurizer.

We trust that this sample line will be of your interest.
More plants are available.


Raw material:
fruit, vegetables
A.1
Washing, sorting, peeling, dicing, chopping, destoning, cooking, refining, mixing
A.2
Citrus and berries fruit: extracting
Fruit cream or juices
A.3
Mixing, concentrating, cooking
A.4
Mixing, deareating, homogenizing, pasteurizing
Jam, marmalade, ketchup, concentrated fruit
Fruit juice or nectar hot filled
B -Packing
Rinsing, blowing, filling, capping, pasteurizing, feeding, drying
C - Additional machines for vegetables
Peeling, blanching, cutting, mixing, homogenizing, seaming, sterilizing
Finished product in jars, cans, bottles, etc.

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B - Packing equipment for juice, jam and concentrated products

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B.3 2 tables in stainless steel
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B.5 Semi-automatic screw caps table machine
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B.7 Pasteurizer tunnel for jars or bottles
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B.7.2 Discharging belt
B.7.3 Drying equipment
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- VEGETABLE PROCESSING

C - Additional machine to handle vegetables

C.1 Universal abrasive peeler machine
C.2 Continuous water drum blancher
C.3 Batch basket centrifuge
C.4 Cutter/Mixer/Homogenizer
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- SERVICES

D- Services

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- CANDIED FRUIT

E - Candied fruit demonstration and research plant

E.1 Candied fruit demonstration and research plant

- FOOD PREPARATION

F – Laboratory for food preparation

F.1 Pulper-refiner machine
F.2 Compact multi-functional bench
F.3 Mobile crane
F.4 Compressed air at 6 bar producer

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FRUIT LINE

This line has a capacity to process 100 to 150 kilograms of fresh products per hour.

A.1 - European-type fruit handle and extraction line

Raw material: fresh fruit like apple, pear, peaches, apricots, tomato.
Final product: fruit cream or juices

A.1.1 Washing machine with pilot elevator

Driven by a motovariator to feed the line in continuous, and to process fruit and vegetables. This washing unit is able to clean the fruits and vegetables from contamination of sprays and dusts before processing.

The washing of the fruits is carried out in a basin in which the water is kept in constant turbulence by air supplied by a fan. A second washing is carried out by a system of nozzles, spraying water, placed upon a stainless steel conveyor belt with a net shape, transporting the fruit or the tomatoes. The same spray nozzles also cleans the conveyor belt.
The conveyor belt takes the fruit from the washing basin, conveying the same fruit under the nozzles and then brings the fruit on the sorting line. The conveyor belt has a width of 300 mm and is driven by a 0.5 kW gear motor.
The washing machine is composed of:

- Structure in AISI 304 stainless steel
- Conveyor belt manufactured in intralox
- Water injectors
- Discharge tap for dirty water
- Ports for inspection and cleaning
- Fan of 1,1 Kw to blow air in the water

Water consumption: about 0.5 m3 per hour
Installed power: 1.65 kW
Dimensions: 800 x 2,600x1,000h mm (Indicative)

A.1.2 Sorting line

For fruit and vegetables, required to demonstrate the proper grade of fruit and vegetables.

It is composed of:

- An Aisi 304 stainless steel frame with a length of 3,000 mm and a width of 300 mm
- Intralox belt width 300 mm with lateral roller
- Chutes lateral to the belt for the discharge of the wastes
- Unloading hopper
- Variable speed motor
- 4 lateral tables to prepare the fruit and vegetables
- 2 lateral foot boards for the operators.

Installed power: 0.5 kW.

To distribute the different kind of raw material to the right line, with an AISI 304stainless steel frame and belt in intralox.
The length of the belt is 4 metres, with a width of 300 mm.
The belt is moved by a gear motor of 0.37 kW.
Installed power: 0.37 kW

A.1.3 Distribution belt

This is a universal unit is used to transport in elevation the fruit to charge the pitting unit and/or the chopper.
Manufactured in AISI 304 stainless steel; complete with hopper, belt in intralox and structure in stainless steel.
This belt is driven by a motovariator.

A.1.4 Elevator

The unit is composed of 2 stainless steel baths, each with a volume of 100 litres. The first bath has a heating system to permit the soda peeling and the blanching operation, the second uses only for cooling purposes and rinsing.
Each bath tank has a stainless steel basket in perforated steel of 3 mm. The part in contract with the product is manufactured in stainless steel AISI 316; each of these parts is covered. The system to heat the water is manufactured with two stainless steel electrical resistances of 4.5 kW each.
The bath temperature is controlled by electronic instruments and a temperature probe, which switch on and off the electrical resistance in order to set and keep the temperature.
The cooling of the second bath is made with a manual valve place on the water inlet entrance. All the two baths are provided with a thermometer to indicate the temperature. Included also is a system to drain the water from the bottom and an overflow system.
The unit is provided with a control panel, which makes it possible to set the temperature and the time of the operation.

Water consumption: 100 litres per hour
Installed power 9 kW

A.1.5 Soda peeling machine for fruit

Suitable for the treatment of small quantities of apples, tomatoes, peaches and other vegetables to be peeled physical/chemical process. This process is required to demonstrate the peeling of small quantities of fruit and vegetables under hygienic conditions for further processing and preservation in tins.

A.1.6 Vegetable and fruit dicing machine

Suitable to dice vegetable or other food. This unit gives a uniform cutting of the vegetables and fruit for hygienic packing.
This is a semi-automatic cutter machine for vegetables, with an aluminium structure, a motor reducer of 1.5 kW and three phase with thermal protection. The unit also has a feeding chute and brake motor with a rotation speed of 375 and 700 revolution per minute. It is complete with stainless steel frame and two rotating disk slicers that can produce slices between 6 to 10 millimetres in thickness.
Its dimension, without the supporting table in millimetres is 380x475x515(h). Other slice disks to cut in sticks and cubes vegetables are also available, as well as an electrical start and stop button.
Machine weight 50 kg.
Power supply: 380 V three phase.
Installed power: 1.5 kW

A.1.7 Fruit chopper

This machine can be used to chop fruits.

It is supplied with a standard chopping section, which could be eventually replaced with other special sections in order to reduce or increase the chopping degree. It has a capacity to chop around 200 kilograms per hour of fresh fruit, and could change within limits according to the product to be treated and the chopping degree, which is required.
The capacity of the unit varies from 0 to 200 kilograms per hour and is composed of:

- A stainless steel support structure
- Feed and discharge hopper in stainless steel
- Chopping section with chopping rotor and a perfored grill
- One movable cover for the chopping section
- One 3 kW motor, supplied with safety protection
- One water connection to clean the chopper easily

All parts in contact with the product are manufactured from AISI 304 stainless steel. 3 additional grilles with holes of 20-30-40 mm. Power consumption: 3 kW.
Water for cleaning: 50 litres per hour

A.1.8 Drum pitter

The machine is designed to pit fresh fruits with detachable stone, such as apricots, plums, cherries, to be subsequently reprocessed for the production of cream. The de-stoned fruits are discharged from the machine after crushing or chopping into rather large pieces.
The drum pitter consists of:

- A stainless steel feeding hopper
- A stainless steel drum covered with special rubber against which the stone is forced during de-pulping
- A stainless steel drum with special toothed discs that are suitably spaced to allow retention of the fruit pulp
- A pusher with alternative upwards movement to press the fruits between the two drums rotating in convergence
- A small cleaning roller for the rubber drum
- A combined blade chute device with vertical and horizontal adjustment that is placed below the two drums to separate the stones from the pulp
- Chute to discharge the stones, pulp and recovery of juice from the rubber drum
- A speed reducer with gearing in oil, complete with necessary gears, chains, pulleys and belts
- Two crankcases for covering the mechanical devices in movement
- Comb device for the removal of pulp from the toothed stainless steel discs.
- One additional stainless steel drum to handle cherries
- Installed power of 1.1 kW

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A.1.9 Continuous single tube cooker

For fruits and tomatoes to realise the heating process of the fruit or tomatoes from 20°C to 80°C (cold break system).

It is composed of:

- A feeding hopper of 200 litres with minimum and maximum level probes
- A mono feed pump with screw system with an installed power of 0.55 kW, with variable speed
- An AISI 304 stainless steel frame
- 2 double jacket mono-tubular heating section with a diameter of 40 mm and length of 3,000 mm
- Pipes for the product holding time of 90”
- 3 way valve to recycle the product if the temperature is not correct
- A thermometer
- Steam heating group composed of: manual valve, filter, pneumatic valve to adjust the temperature, condenses discharge group, water/steam heat exchanger to produce overheating water, pump, tank and pipes
- Pneumatic system to regulate the temperature with registration on paper of the cooking temperature

Installed power: 0.55 kW
Steam consumption: 30 kilograms per hour
Compressed air consumption: 20 Nl/min

A.1.10 One step refiner

To refine the fruit complete with a 50 litres basin and extraction pump, consisting of:

- A feeding hopper
- Two heads and two sides
- A sieve with holes diameter 1.0 mm for fruit (dimension 220mmx800mm)
- A set of special adjustable beaters for fruit
- A 50 litres bin manufactured in AISI 304 stainless steel, bin with sloped bottom, fitted with level regulator for the automatic start up and stop of the pump, complete with flat cover, for the refined juice collection
- A 3 kW motor, with pulleys, belts and protective guard
- 4 legs
- Closing hood
- The sieve is interchangeable according to the different fruit

Installed power: 3 kW

A.1.11 Mixing tank for product with slow stirrer capacity of 500 litres

Manufactured in AISI 316 stainless steel, with the following characteristics:

- AISI 316 stainless steel tank, with glazed and pickled inside and outside surface
- Pickled, flattened, grounded and spotted welding
- Conical bottom with total discharge
- Cover in two halves, one of which is fixed and the other one can be opened
- Total discharging piping, manufactured in stainless steel with bronze tap
- Low anchor stirrer to keep the product in agitation

Installed power: 0.75 kW.

Sanitary volumetric pump manufactured in AISI 316 stainless steel, suitable for alimentary products, for pressure up to 4.5 bar. Positive pump single screw type with stainless steel screw rotor and alimentary synthetic rubber stator. Driven by speed variator adjustable by hand wheel.

Speed variator coupled in-line with joint.
Everything assembled in a stainless steel base.
Consumptions: electric motors: 1.1 kW

A.1.12 Fruit cream pump extraction type mono

A.1.13 Accessories

Connections, taps, valves, piping, fittings, joints, etc, in stainless steel, working platform for the pitting and chopping unit. Some product connexions could also be realised with flexible hoses. Pre-assembling and testing will be done in our factory.

Stainless steel electric board with doors in order to allow a complete internal inspection.

The unit includes main automatic switch, on/off switches, warning lights and an automatic overload cut out to protect the motors.

A.1.14 Electrical board

FOOD TECHNOLOGY

FRUIT LINE

A.2 – Citrus and berries line

Raw material: fresh fruit like oranges, grapefruits, tangerine, berries.
Final product: fruit cream or juices

All the parts in contact with the product are manufactured in AISI 316 stainless steel.

The machine is complete with:

- Manual fruit loading hopper
- Supporting structure in stainless steel
- Hydraulic handling set with control unit
- Electrical control panel to control the juice extractor
- Pair of squeezer cups of stainless steel, with refining cylinder, pulp expulsion chamber and peel removal shoot.
- Juice collector

The squeezing devices are interchangeable according to the dimension of the fruits to squeeze.

- 1 upper cup
- 1 lower cup
- 1 stainless steel die diameter 28mm
- 2 knives for stainless steel die
- 1 set stainless steel refiner filter (1mm)
- 1 set of Teflon nozzles
- 1 Teflon plug

Installed power: 3 kW
Alimentation: 380V – 50Hz, three phase
Dimensions in mm: 1200 x 600 x 1950 (h)

A.2.1 Citrus fruit juice extractor

This unit is suitable for the processing of hard peel citrus fruit such as oranges, grapefruits, and tangerine to be used, for the production of high quality drinking juice. This extractor is able to process fruit with dimension from 40mm to 80mm in diameter. Juice extraction takes places from the centre of fruit through centripetal compression. The extractor has one head with two pairs of squeezer cups. It is made out of stainless steel frame, and has a capacity of about 200 kilograms per hour of oranges (diameter 50-60 mm). The juice extractor is moved by a hydraulic central unit.

To receive the citrus juice complete with volumetric positive pump that has an installed power of 0.37 kW.

A.2.2 50 liters buffer tank

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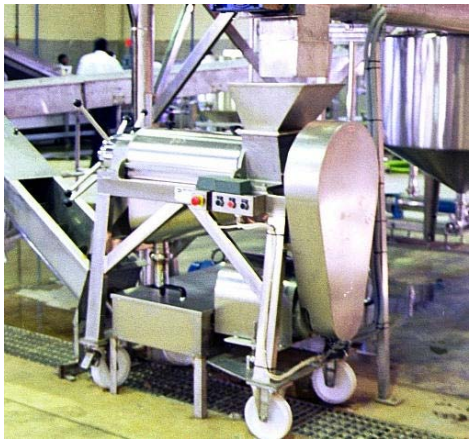


A.2.3 Fruit cream extractor

Specially designed to produce fruit cream from berries and soft products as kiwi or refiner orange and citrus juice.

The machine is manufactured in AISI 304 stainless steel and it is composed of a product feeding chute which convey the product inside the unit.

A screw conveyor push gently pushes the product through the holes of a sieve. The sizes of the holes depend on the technological need; for fruit cream extraction normally 0.5mm – 0.8mm. The sieve is reinforced and strongly connected to the frame of the machine. An external wheel device adjusts the pressure of the extraction.

The unit is driven by a motor of 4 kW.
Complete with electrical board with start stop push button.
Consumption: 4 kW
Water for cleaning: 50 litres per hour

A.2.4 80 liters bin

It is manufactured in AISI 304 stainless steel with sloped bottom, fitted with level regulator for the automatic start up and stop of the pump. It is complete with flat cover.

A.2.5 Fruit cream pump extraction type mono

Sanitary volumetric pump manufactured in AISI 316 stainless steel, suitable for alimentary products, for pressure up to 4.5 bar. Positive pump single screw type with stainless steel screw rotor and alimentary synthetic rubber stator. Driven by speed variator adjustable by hand wheel.

Speed variator coupled in-line with joint.
Everything assembled in a stainless steel base.
Consumptions: electric motors: 1.1 kW

NOTE:

The juice or the cream is pumped into tank A.1.11.

The line is driven from the control panel of line A1.

FRUIT LINE

A.3 - Fruit and tomato concentrated product, jam and ketchup preparation line

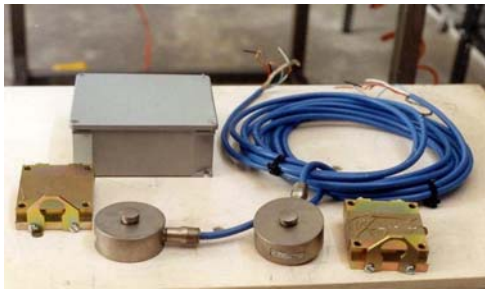
Raw material: fruit cream or juices
Final product: jam, marmalade, ketchup, concentrated fruit

Manufactured in AISI 316 stainless steel, with the following characteristics:

- AISI 316 stainless steel tank, with glazed and pickled inside and outside surface
- Pickled, flattened, grounded and spotted welding
- Conical bottom with total discharge
- Cover in two halves, one of which is fixed and the other one can be opened
- Total discharging piping, manufactured in stainless steel with bronze tap
- Low anchor stirrer to keep the product in agitation

Installed power: 0.5 kW

A.3.1 Mixing tank for viscous product with slow stirrer capacity of 200 litres



To measure the weight of the ingredients necessary to prepare food product, this scale is installed under the mixing tank. Plate made in stainless steel.

A.3.2 Electronic scale

A.3.3 Vacuum concentrating /compact pan

This unit is specially designed for concentration under vacuum of fruit juices or tomato juice, so as to obtain jams, tomato concentrate and fruit preserve with surface condenser.

Its evaporation capacity is 20-30 litres per hour and its working capacity is 35-40 kg per hour of product.

This equipment is used for laboratory production of high quality jam and marmalade, and does not require a large space.

The unit is composed of:

- One under vacuum bowl concentrator with a diameter of 400 mm, operative volume of 40 litres, with external part of the jacket in carbon steel isolated and covered with a stainless steel plate, internal part of the bottom, support of mm 100 and dome in AISI 304 stainless steel complete with stirrer moved by a motoreducer. The stirrer is provided with a system to clean the internal part of the bottom made in stainless steel and Teflon. The jacket works with steam at 3 bar and comes with steam inlet valve, safety valves, pressure gauge, and discharge tap, as well as water inlet and outlet.
- Internal bottom is made in AISI 304 stainless steel complete with discharge valve.
- Dome made in AISI 304 stainless steel, complete with door, sample drawing, inlet tap, vacuum meter and thermometer, two connections with valve to suck the product, a vacuum breaking cock, a vacuum gauge and product discharge valve of 60mm in diameter.
- Tube bundle condenser, with water feeding 40-50 litres per minute at the pressure of 2bar, with condense discharge and level gauge. The condenser is also manufactured in stainless steel.
- Motor stirrer 0.25 HP 15 rpm anchor type to clean the boule internal surface
- One liquid ring vacuum pump hydro-pneumatic type with cast iron body, impeller and shat in stainless steel. The pump is complete with a motor of 1.0 kW and connection with the condensation and the concentrator. 2900 rpm
- Manual vacuum regulation valve
- One working platform to support the concentrator

All the parts in contact with the product are in stainless steel AISI 304 with the exception of some parts that are manufactured in Teflon or other suitable material.

It also has an electrical control panel.

Consumption
Installed power: 1.37 kW three phase – 50 Hz
Drinkable water: 1,000 kg/hour
Steam at 3-5 bar: 50 kg/hour

With a capacity of 50 litres provided with an isolation to keep the product to a constant temperature.

The tank is slightly inclined and equipped with slow stirrer to keep the product homogeneous and push it toward the exit.

Installed power: 0.5 kW

A.3.4 Thermo-conditioned tank

This is a sanitary volumetric pump manufactured in AISI 316 stainless steel, suitable for alimentary products.

It is driven by speed variation adjustable by hand wheel.

Consumptions: electric motors with 1.1 kW.

A.3.5 Jam pump

Unit to cook fruit pulp to produce jam with a capacity of 100 litres (diameter 600 mm). The unit is equipped with jacket complete with security valve.

A pan is provided with a low anchor stirrer which laps the walls. The stirrer is moved by a 0.5 kW reduction gear.

The unit has two legs and a start/stop button. The product is discharged from the bottom through a DN 50 hole provided with valve.

Installed power 0.5 kW.

Steam consumption: 50 Kg/hour.

A.3.6 Concentration and cooking unit

A.3.7 Accessories

Connections, taps, valves, piping, fittings, joints, etc, in stainless steel, working platform for the pitting and chopping unit. Some product connexions could also be realised with flexible hoses. Pre-assembling and testing will be done in our factory.

Stainless steel electric board with doors in order to allow a complete internal inspection.

The unit includes main automatic switch, on/off switches, warning lights and an automatic overload cut out to protect the motors.

A.3.8 Electrical board

FRUIT LINE

This line has a capacity of 200 litres per hour and is suitable to dilute concentrates or solutions. It is composed of a 200 litres mixing tank, mono pump, tubular pre-heater, de-aerator and tubular pasteuriser. Everything is assembled on a stainless steel frame.

With this unit it is possible to prepare different products, as the liquid could be de-aerated and pasteurised. This is highly beneficial for conducting research on the production of different juices and their treatment for packing in different forms. This is very useful in developing technologies on small scale requiring less quality of raw material as compared to installation.
This line will require a small space of approximately 2 x 6 metres.

A.4 - Fruit juice treatment line

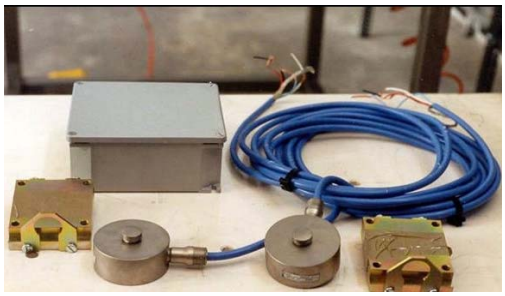
Raw material: fruit cream or juices
Final product: fruit juice or nectar hot filled

Execution in AISI 304 stainless steel, with the following characteristics:

- AISI 304 stainless steel tank, with glazed and pickled inside and outside surface
- Pickled, flattened, grounded and spotted welding
- Conical bottom with total discharge
- Cover in two halves, one of which is fixed and the other one can be opened
- Total discharging piping, manufactured in stainless steel with bronze tap
- Glass level rod, with stainless steel protection.
- Three legs supporting structure manufactured in stainless steel with wheels
- 3 blades stirrer to keep the fruit cream in agitation

Installed power: 0.5 kW

A.4.1 Mixing tank capacity 200 litres



To measure the weight of the ingredients necessary to prepare food products. This scale is installed under the mixing tank and has a plate made in stainless steel.

A 4.2 Electronic scale

A.4.3 Pump

Sanitary volumetric pump manufactured in stainless steel AISI 316, suitable for alimentary products, for pressure up to 4.5bar. Positive single stage mono pump DN 25 with stainless steel rotor and alimentary synthetic rubber stator. Driven by mechanical speed variator adjustable by hand wheel from the maximum speed down to the minimum and stop (variation ratio 1:5). Speed variator coupled in-line with joint. Everything assembled on a stainless steel base.

Installed electrical power: 0.55 kW.

A.4.4 Tubular juice pre-heater

Designed for the treatment of juices, nectar and concentrated product. It has a thermal cycle of 10-55°C.

The machine is composed of:

- 1 section tube with a capacity of 200 litres per hour of product
- Frame in stainless steel AISI 304
- Pipe connections for various fluids in stainless steel
- Heated water line complete with plate heat exchanger expansion tank, centrifugal pump, manometer,
- Instruments to record the temperature at the exit
- System to adjust the thermal fluid temperature
- 3 ways valve to divert the product in case of low temperature
- Necessary electro-pneumatic transducers
- Pneumatic valve to adjust steam in hot water production
- PT 100 probes for temperature measurement
- Air reducing equipment for compressed air
- Electrical control board

Consumption:
Electrical Power: 0.37 kW
Steam: 20 kg/hour
Compressed air: 50 Nl /minute

A.4.5 Juice de-aerator

With a capacity up to 200 kg/hour of product.
It is composed of:

- A large capacity stainless steel tank internally and externally sanitized, complete with inspection holes, connection with the product and instrumentation
- An extraction motor driven mono pump with speed variator
- A vacuum motor-driven pump, hydro pneumatic and liquid ring type, for the extraction of the air and the condensation water.
- Instruments consist of vacuum gage, vacuum break, automatic level regulator which acts upon the feeding motor pump and guarantees a constant level of the product inside the de-aeration chamber
- A vacuum diaphragm regulator which keeps a constant vacuum inside the de-aerator
- A spray system to distribute the products
- Stainless steel connections for the product with connection joints and valves according to DIN rules
- Connections between the de-aeration room and the vacuum motor pump are in stainless steel.
- All the part in contact with the product are in stainless steel

Installed power 2 kW.
Water necessary to condense the steam: 0.3 m3/hour.

With a fixed speed for fruit juice to carry out a treatment of high pressure and lamination in milk.
The working pressure is up to 220bar. The homogenizer is made in sanitary version and has a capacity of 200 kg/hour of juice.
The machine is completed with: gear, starter, pressure stabilizer, manometer, safety system, frame made in carbon steel and covered by stainless steel plates with manometer to check the pressure.
Electrical control panel
Installed power: 2.2 kW
Water consumption: 50 litres per hour

A.4.6 Homogenizer

A.4.7 Juice pasteurization unit

This machine can be used to chop fruits. It is composed of:

100 litres buffer tank for juice storage

- Made in AISI 304 stainless steel, with the following characteristics
- AISI 304 stainless steel tank, with glazed and pickled inside and outside surface
- Pickled, flattened, grounded and spotted welding
- Conical bottom with total discharge
- Plate cover with CIP (cleaning in place) devices.
- Total discharging piping, manufactured in stainless steel
- Glass level rod, with stainless steel protection.
- Three legs supporting structure manufactured in stainless steel

Pump

Sanitary volumetric pump manufactured in AISI 316 stainless steel, suitable for alimentary products, for pressure up to 4.5Bar. Positive single stage mono pump DN 25 with stainless steel rotor and alimentary synthetic rubber stator. Driven by mechanical speed variator adjustable by hand wheel from the maximum speed down toe minimum and stop (variation ratio 1:5). Speed variator coupled in-line with joint. Everything assembled on a stainless steel base.
Installed electrical power: 2.2 kW.

Tube in tube pasteurizer

Plate pasteurizer designed for the treatment of juices and nectar and concentrated product.
Thermal cycle 40-110-90 (35 in case of recycle).
The machine is composed of:

- 3 section tube in tube pasteurizer with a capacity of 200 l/h of product
- Pasteurising section from 40°C to 110°C using overheated water from 120 to 105°C
- Pre-cooling product section from 110 to 90°C with water in counter flow
- Cooling section in case of recycle from 90 to 35°C with well water at 18°C

The exchanger is composed of:

- Tubes in stainless steel AISI 316
- Frame in stainless steel AISI 304
- Pipe connections for various fluids in stainless steel
- Thermal holding system for 45 seconds with multiple pipes. The pipes are connected in serial with detachable turns and mounted on a supporting frame in stainless steel.
- Superheated water line complete with plate heat exchanger, expansion tank, and centrifugal pump.
- Instruments to record the pasteurising and the exit temperature
- System to adjust the thermal fluid temperatures
- 3 ways valve to divert the product in case of low temperature
- Necessary electro pneumatic transducers
- Pneumatic valve to adjust steam in hot water production
- PT 100 probes for temperature measurement
- Air reducing equipment for compressed air
- Electrical control board

Consumption:
Electrical Power: 3 kW
Water: 0.5 m3/hour in case of recycle
Steam: 30 kg/h
Compressed air: 50 Nl/minute
Electrical control board to control all the line.
Frame in stainless steel to support all the line.

A.4.8 Accessories

Connections, taps, valves, piping, fittings, joints, etc, in stainless steel, working platform for the pitting and chopping unit. Some product connexions could also be realised with flexible hoses. Pre-assembling and testing will be done in our factory.

A.4.9 Electrical board

Stainless steel electric board with doors in order to allow a complete internal inspection.

The unit includes main automatic switch, on/off switches, warning lights and an automatic overload cut out to protect the motors.

FOOD TECHNOLOGY

FRUIT LINE

B - Packing equipment for juice, jam and concentrated products

To handle all kind of bottles or jars with a stainless steel frame, 4 legs with adjustable feet, the machine is provided with two working stations the first to rinse the bottles with fresh water, the second to blow the bottles with compressed air filtered.

B.1 Semi-automatic rinsing and blowing machine

The dosing unit is completed with:

- 1 suction syringe with a volume of 1000 cc
- Teflon gaskets
- 1 head filler to fill the product directly in the container to avoid foam problem
- Regulation of the volume to dose with ball crank handle with graduated scale
- Mechanical system to keep the container up with a clips on container neck
- Start of the dosing cycle from start button or pedal
- All parts in contact with the product are in stainless steel AISI 304
- Structure in stainless steel AISI 304
- 30 litres stainless steel conical hopper with flat cover and level probe

Air consumption: 50 N l/minute.

B.2 One head pneumatic piston bench top filler

With dosing piston provided with adjustable run to dose jam or concentrated products from 50 cc up to 1000 cc.

To support the volumetric filler and the twist-off and screw capping machine.

Indicative dimensions mm 2000 x 800

B.3 2 tables in stainless steel

With 2 heads.

Complete with expansion tank, 2 heads for the filling function, stainless steel frame, vacuum pump and start stop button.

B.4 Semi-automatic vacuum filling machine

For Aluminium screw caps.
The unit has a frame in stainless steel dimension 400 x 400 mm (approximately), one capping head able to close the aluminium caps with three rollers; a system with a worm screw able to permit to adjust the working height.
Safety devices.

B.5 Semi-automatic screw caps table machine

The unit has a frame in stainless steel dimension mm 400 x 400 (approximately), one capping head able to close the twist off caps; a system with a worm screw able to permit to adjust the working high, an adjustable friction system to close the caps. Equipment to block the glass jars during the closing action.
Safety devices.

B.6 Pneumatic semi-automatic twist off caps table machine

B.7 Pasteurizer tunnel for jars or bottles

With a total surface of about 3 sqm. Net dimensions of the belt conveyor: width 1.000 mm and length 3.000 mm.
The tunnel is divided in three sections: heating/holding, pre-cooling, cooling.
The treatment times are adjustable according to the production needs and jars size, by means of belt speed regulation through moto-variator.
Each section has almost the same dimensions, so the tunnel is divided in 3 parts each one approx. 1000 mm. long.

Some additional characteristics of the tunnel are:

- Temperature control in the preheating and heating sections are by means of thermal regulator, enclosed in the electrical board, which acts regulating the steam modulating valve
- External hood, manufactured in AISI 304 stainless steel, for suction of the steam from the first section
- Upper covers of the tunnel manufactured in AISI 304 stainless steel and designed at hydraulic seal proof

Mechanical characteristics:
Execution of the structure in AISI 304 stainless steel, equipped with feet adjustable in height
The tunnel is divided in three sections:

- First section – heating and holding section, by means of hot water, heated up to 98°C by means of stainless steel heat exchanger coil water/steam; water temperature can be widely adjusted according to the production needs. The unit is completed by thermal regulator with its bypass group and instruments for temperature water indication. Hot water is sprayed by means of nozzles, placed on the upper side of the belt conveyor, and completely dismountable for an easy cleaning and maintenance.
- Second section – pre-cooling with water at about 60°C, coming from the last section. Water from this section will be discharged by an over flow and it can be recycled, using a pump, into the cooling tower.
- Third section –final cooling, is provided with manifold for the cooling water distribution from the cooling tower, equipped with modulating valve. The water is collected in a chute, placed in the lower part of the tunnel section and pumped by a proper centrifugal pump into the pre-cooling section; the pump will suck the water from a lateral and external bin completed with level control and extractable stainless steel filter grid.
- The conveyor belt is manufactured in intralox, type S 400 Raised Rib in polypropylene, grey colour. The belt is suitable to resist to the process temperature and high pressure / weight load.
- Belt bearing in tubular stainless steel 100 x 50 x 3
- Belt sliding plane in AISI 304 stainless steel pressed sheet, “U” shaped and 1.5 mm thickness
- Upper cover in AISI 304 stainless steel 1.2 mm; hydraulic sealed proof
- Stainless steel hood placed at the inlet of the tunnel complete with aspiration fan
- Pulling and return axle in square tubular stainless steel 60 x 60 mm
- Plastic diaphragm at the inlet and outlet of the tunnel
- Transmission by chain of 1” with protection cover

Consumptions:
Motor: 1.1 kW
Water at 2-3 bar: 1 m3/hour
Steam at 3-5 bar: 100 kg/hour (approximately)

To feed the glass jars to the pasteurizer tunnel, the belt has only one track and it is moved by a variable speed motor to adjust the belt speed to the effective number of jars and to their time of treatment.

B.7.1 Feeding belt

To evacuate the pasteurized glass jars, the belt manufactured in stainless steel has two tracks and it is moved by a motoreducer to evacuate faster the jars. Installed power: 1.5 kW.

B.7.2 Discharging belt

To dry the glass jars which come out of the machine.
This equipment can be installed on the output position of the machine, or on the discharge transport belt; it is manufactured in stainless steel and equipped with an electric fan. It can be complete with attack for compressed air collector to eliminate the water on the upper part of the jars.

B.7.3 Drying equipment

To put self-adhesive labels on cylindrical bottles with a diameter from mm. 65 to mm. 115.
The bottle introduction in the labelling unit starts the labelling operation. It is possible to apply front and back labels on one bottle if the two labels are placed on the same roller with a distance between them of 2 or 3 mm. There is also a disposal to adjust the distance between the front and the back label. Of course, the labelling unit is able to apply only one label on a bottle.
The rotating sleeking system permits to have a perfect label on a bottle. The machine is very simple to use.
Dimension in millimetres 400 x 300 x 400 h (table version).

B.8 Semi-automatic labelling machine

Vacuum chamber and/or inert gas packing machine with its basement on wheels.
The machine is manufactured entirely in stainless steel and it is equipped with an advanced vacuum pump which guarantees reliability and duration.
The machine is provided with an electronic panel with the possibility to set 9 memories. The vacuum pump has a capacity of 20 m^3/hour. The packing machine has 2 sealing bars of 520 mm. and a chamber with the following dimensions in millimetres 630 x 530 x 200 h. The machine is able to close 4 bags in one cycle.
Indicative dimensions in millimetres: 660 x 655 x 1020 h.
Weight: 150 kg.
Power supply: 380V -50 Hz.
Installed power: 1.5 kW.

B.9 Packing machine for vegetables

VEGETABLES

Note: for the washing and selection unit the equipment for fruit will be used, same for the cutting machine.

C - Additional machine to handle vegetables

The machine is able to peel by abrasion different kind of vegetable as potatoes, carrots, onions and fruits.
It is composed of a stainless steel body, a transparent plastic cover, a motor protected against the infiltration of water, a water inlet connection with anti-return device, electrical control panel with start stop button, timer.
Protection against power outage to prevent accidental starting.
3 phases motor 380 V, 50 Hz, 0.75 kW.

Capacity 300 Kg/h of product (potatoes).
Indicative dimensions in millimetres: 530 x 310 x 530
Weight 25 Kg

C.1 Universal abrasive peeler machine

C.2 Continuous water drum blancher

Made in AISI 304/31 6stainless steel.
Indicative capacity: 200 kg/hour.
Indicative installed power: 0.55 kW
Steam consumption: 60Kg/hour
Compressed air: 20 Nl/minute
Water: 400 litres/hour

- The structure standing on stainless steel supports. Capacity of the blanching bowl ranges from min. 150 to max. 300 litres of water.
- All internal welding are smoothed and polished.
- The speed of the blancher varies from 3 to 15 minutes of blanching time.
- The food product is pushed by a stainless steel screw and a rotating drum.
- The perforation size of the rotating drum is small enough to accommodate beans and peas.
- The blancher includes stainless steel covers to reduce evaporation, which can be manually opened and closed; equipped with all safety features, a variable motor drive 220/380 Volts 50 HZ, IP 55 protection.
- It also includes a temperature recorder with a PT100 probe, thermo-regulator with 0.5 °C accuracy, temperature control valves between 70 and 100 °C.
- The unit has an inlet hopper and an outlet chute with a dewatering sieve.
- It includes a water circulation pump to maintain homogeneous temperature.
- It includes all necessary steam valves, condensate valves, water inlet valves, and steam traps.
- The heating medium is indirect steam available through an SS serpentine pipe inside of the blancher with sufficient capacity to maintain the required temperature.
- The unit is be equipped with an electric panel containing all necessary controls.

Electric panel closed in a special waterproof box, fastened to the jacket. Control console assembled on the box top for easy access. Electric motor 1400 rpm of large dimensions, with oversize shaft, resistant to any type of stress. Thermal circuit breaker to protect the electric motor against overloading. Cover is locked up when machine is started, according to the current safety regulation. At machine stop, cover is opened by a push button located on the control console. Basket in stainless steel with holes pattern suited to the purpose. Directly mounted on the motor shaft with static and dynamic balance. Self-balancing motor basket unit, mounted on rubber shock absorber.
The centrifuge has a speed of 700 rpm
Basket volume: 52 litres
Basket loading capacity: 25 kg
Installed power: 1.6 kW

C.3 Batch basket centrifuge

For vegetables with outer racket in stainless steel.

- Capacity about 30 litres.
- Stainless steel AISI 316 and 304
- It includes round bottom vessel, lid, internal knives, vacuum pump, a high speed motor with 2 speeds, 2 inlet openings on the lid.
- The unit is mounted on a steel structure and can be easily tilted for facilitating product feeding and discharge.
- The unit can be used for the preparation of meat mixes, chocolate, marzipan, processed cheese, dips, mayonnaise, sauces, and other.
- Installed power: 4.5 /5.4 kW, two speeds at 1500 and 3000 rpm.
- Dimensions: 720 x 600 x 1250 h mm.
- Weight: 110 kg

C.4 Cutter/Mixer/Homogenizer

Pilot scale with vacuum option.

For manual handle of the vegetables.
Indicative dimensions: mm. 2800 x 900, complete with lateral board, 6 legs and adjustable feet.

C.5 2 working tables

FOOD TECHNOLOGY

Filler to fill under vacuum with oil or other liquid as vinegar glass jars with vegetables inside. The machine is composed of:

- Stainless steel frame with a 30 litres tank for the liquid storage, the frame has four legs with adjustable feet
- Filling head manufactured in stainless steel AISI316, it is possible to adjust the working height to adapt it to the different jars sizes
- Vacuum pump to produce vacuum
- Vacuum tank complete with vacuum meter
- All the parts in contact with the liquid and the product are manufactured in stainless steel AISI 316
- Electrical control board with PLC to have the possibility to adjust the filling time, the vacuum time and to choose to make the filling in one or two times

Capacity: up to 200 glass jars/h

C.6 One head semi-automatic vacuum machine

To close the cans with a diameter between mm. 56 and mm. 215 and with a height between mm. 30 and mm. 250.
The seaming machine is equipped for one can diameter.
Capacity up to 150 can/h.
Installed power: 0.5 kW.
Supporting stainless table.

C.7 Semi-automatic can seaming machine

Horizontal steam autoclave to sterilise canned product manufactured in stainless steam AISI 316.
Frame in stainless steel AISI 304.
The sterilisation process is made with sutured steam. The autoclave has a capacity of 500 litres. The temperature sensor is a PT100 type, the pressure sensor is ceramic. The working pressure is 3.5 bar.
A special cover with an horizontal opening system is provided. The autoclave is provided with speed cooling process, electrical board, 2 baskets.
Max working temperature: 135°C
Sterilisation room dimensions: diameter 700 mm., height 800 mm., capacity 500 litres
Weight: 173 Kg
External dimensions: mm. 1000 x 2250 x 1220 h
Total installed power: 2 kW
Steam consumption: 50 Kg

C.8 Sterilization surge tank

FOOD TECHNOLOGY

C.9 Drying unit for fruit and vegetables with forced air circulation

Room drier for fruit and vegetables composed of:

- Structure in aluminium and stainless steel
- A series of movable valves
- Fan with motor
- External air suction group
- Door
- Electrical control panel to control the temperature
- Air/steam heat exchanger to heat the air at a programmable temperature
- Electronic thermometer to adjust the temperature with an accuracy of +/- 1°C
- Tray with wheels
- 40 looms with plastic net, dimensions mm. 600 x 600

Indicative dimensions: mm. 2250 x 750 x 2150 h
Consumption: 40 kg/h of steam

SERVICES

Group suitable to recycle and cool water up to 10.000 l/h, composed of a pump for water return to the tower, an evaporation tower, one pump suitable to deliver water to the plants, electric control board. The group can treat water up to 45°C temperature approx, exchanging 60.000 kcal/h in standard conditions.
Consumptions:
Electric motors: 1.1 kW
Water at 2-3 bar: 50 l/h

D.1 Water cooling tower

D.2 Cold store

Pre-fabricated cold storage room with floor for fruits and vegetables with the dimensions mm. 2900 x 4060 x 2400 h to keep the product at +4 °C with an external temperature of + 35°C.

The room is manufactured with modular sandwich insulated panels with 80 mm thickness; the wall panels are made in galvanized steel and plasticized with atoxic white PVC. The inside parts of the roof panels are made in galvanized steel and plasticized with atoxic white PVC, the external sides are made in galvanized steel. Stainless steel contour to fix on the floor the panels with sanitary devices in PVC. The thermal insulation is obtained through expanse self-extinguish polyurethane injection (ISO 3582 rules, density 42 kg/mc, C.F.C. free). Ceiling thickness mm. 80.
The panel's mounting is made by double effect eccentric hooks. The cold room has its insulated door with passage of mm. 1000 x 2000.
Refrigeration group to keep the room at a fixed temperature of +4°C. The refrigeration group has a protection shell made in stainless steel and plasticized with removable panels for an easy maintenance.
1.5 HP hermetic compressor able to produce 2964 Watt between – 10°C and + 45°C using R 404 as thermal fluid.
Ventilated cooler made in copper and aluminium by a fan.
The cold room works in automatic way and has its electrical control panel.
Power supply: 380 V 50 Hz

FOOD TECHNOLOGY

D.3 Cold storage equipment -18°C

Pre-fabricated cold storage room with the dimensions mm. 2400 x 1740 x 2600 h to keep the product at – 18 °C with an external temperature of + 35°C. The room is manufactured with modular sandwich insulated panels with 100 mm thickness.

The wall panels are made in galvanized steel and plasticized with atoxic white PVC. The inside sides of the roof panels are made in galvanized steel and plasticized with atoxic white PVC, the external sides are made in galvanized steel. Stainless steel contour to fix on the floor the panels with sanitary devices in PVC. The thermal insulation is obtained through expanse self-extinguish polyurethane injection (ISO 3582 rules, density 42 kg/mc, C.F.C. free). Ceiling and floor thickness mm 100.
The panel's mounting is made by double effect eccentric hooks. The cold room has an insulated door with passage of mm. 900 x 1900 with electric heating cable to heat the door.
Refrigeration group to keep the room at a fixed temperature of –20 °C. The refrigeration group has a protection shell made in stainless steel and plasticized with removable panels for an easy maintenance. 1.7 HP hermetic compressor able to produce 1353 Watt between – 27°C and + 45°C using R 404 as thermal fluid.
Ventilated cooler made in copper and aluminium by a fan. Temperature probe.
The cold room works in automatic way and has its electrical control panel.
Power supply: 380V - 50 Hz

D.4 2 sinks with work top

The sink has the integrated work top and 2 sinks made in stainless steel aisi 304.
Indicative dimensions of the sink: mm. 500 x 500 x 300.
Indicative dimension of the whole structure: mm. 1600 x 600 x 900 h.
Complete with siphon and drain pipes.

D.5 Freezing tunnel

Freezing tunnel at nitrogenum.

- Frame in AISI 304 stainless steel with legs and adjustable feet
- External insulation by panels in polyhurethane expanse (thickness 120 mm) covered with stainless steel

- Product transport belt completely in AISI 304 stainless steel, useful dimension 600 x 4000 mm. length .The belt is driven by a moto-reducer 0,55 kW complete with inverter in order to have an adjustable resident time of the products inside the tunnel
- Ventilation system composed of 4 fans with diameter of 330 and 400 mm. placed on the top of the tunnel. Fans driven by a 0.75 kW motor each.
- Injection system of the freezing gas and its regulation is realized by spraying nozzles connected to solenoid valve controlled by a PLC and PT 100
- The aspiration system for exhausted gases is by means of a fan with 0.,75 kW; this is connected to a butterfly three ways regulation valve by a flexible pipe. The valve is placed on top of the tunnel at the inlet side.
- Electrical board in AISI 304 stainless steel complete with PLC

Electrical power: 5.05 kW
Complete with 4 wheels with stainless steel support.

FOOD TECHNOLOGY

FRUIT LINE

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E - Candied fruit demonstration and research plant

This unit can produce entire and/or diced candied fruit with a very modern technological cycle. The process is done under vacuum with evaporation in separated section from the candying autoclave. Suitable for delicate products and for avoiding aroma losses.

This unit reproduces the processing condition of the industrial model making the complete candying operation, with a capacity of 50 kg per cycle.

The unit is required for teaching of starch derivates and floor confectionary course and for demonstration of diced candied fruit.

It uses a modern technology to handle food. The unit requires a small space and is completely assembled on a stainless steel frame of 2 x 4 m. approximately.

E.1 Candied fruit demonstration and research plant

Consumptions
Steam: 15/20 kg/h
Water: 200 l/h
Total installed power: 3 kW
Dimensions: mm. 2000 x 4000 x 2500 h

The unit is composed of:

- A candying autoclave with a volume of 100 litres complete with one basket unit in perforated stainless steel and ring for its extraction from the autoclave, manual cover, connection with the other part of the line with valves, vacuum meter, thermometer, capacity 50 kg of fruit per cycle. Basket for the fruit and basket support with wheels.
- A tank to prepare the sugar syrup with a capacity of 150 litres, complete with mixer, jacket in which steam at 0.5 atm. is flowing to preheat the sugar syrup, cover that can be opened in two halves, valves to empty the tank, steam adjusting system in automatic, temperature probe.
- One mono pump to circulate the sugar syrup with parts in contact with the product made in stainless steel, piping and connections. Installed power 1.1 kW.
- Tube nest heat exchanger to heat the sugar syrup, with steam adjusting system with pneumatic valve, filter, condensate group and manometer.
- Expansion tank under vacuum, made in satinized stainless steel, with inspection window, washing system, vacuum meter, valve to break the vacuum, connection.
- Surface steam condenser tube nest type manufactured in stainless steel, complete with connection , two cooling water valves, two tanks for the condense recovery with valves.
- Valve to adjust the vacuum inside the plant.
- Liquid ring pump to get the vacuum in the system with 1 HP motor and water valve.
- Stainless steel frame with adjustable feet.
- Stainless steel pipes and connection among the different parts of the unit.
- Electrical control panel in stainless steel with video and PLC.
- Manual system to extract the basket with the fruit.
- An electrical steam generator of 40 kg/h of steam.

FOOD TECHNOLOGY

FOOD PREPARATION

This line has a capacity to process 100 to 150 kilograms of fresh products per hour.

F – Laboratory for food preparation

Raw material: fresh fruit like apple, pear, peaches, apricots, tomato.
Final product: fruit cream or juices

F.1 Pulper-refiner machine

For fruit and vegetables, execution in AISI 304 stainless steel, floor version. Heavy-duty model equipped with a 5 kW motor (400 V – 50 Hz). Composed of a feeding hopper in AISI 304 stainless steel, perforated sieve, a set of paddles rotating at 1500 rpm, chute for refined product discharge, chute for waste discharge, start and stop button. Equipped with sieve of 1,0 mm.
Dimensions: 860 x 480 x 840 h mm.

F.2 Compact multi-functional bench

For fruit and vegetables, required to demonstrate the proper grade of fruit and vegetables.

Composed of 3 sections and suitable for the operations of cooking, dosing and pasteurization of glass jars and containers.
Useful for the preparation of jams and juices.

A cooker is the first section with 50 litres capacity for the cooking of fruits and vegetables; the system works in under vacuum conditions with processing temperature in the range of 60°C. A double jacket with steam in circulation realizes the heating of the cooker; an electrical generator included in the frame of the bench produces steam.

The second section is composed of a dosing unit, which takes the product directly from the cooking basin and doses it in proper valve.

The third section is composed of a pasteurization tank for the containers previously manually closed. The tank has a capacity of 240 litres and it is equipped with one basket, which can be extracted by means of a manual crane. The water inlet into the pasteurization tank is heated always by steam. It is possible to work separately with cooker and with pasteurizer tank.

Capacity is approximately 40 Kg per production cycle; the duration of each cycle depends on the final product to be produced. Equipped with electrical control box complete with PLC that gives the possibility to save the recipe. Execution completely in AISI 304 stainless steel. The unit is on wheels.

Electrical power: 30 + 2 kW
Dimensions: 2700 x 1150 x 1600 h mm. (height at work plane: 1000 mm)

F.3 Mobile crane

To lift the basket with the glass jars.

F.4 Compressed air at 6 bar producer

With a capacity of 260 l/min of compressed air, complete with 100 litres tank made in carbon steel, with aluminium heads and cylinders with large cooling fins for a better cooling.
The compressor has cast iron cylinders to guarantee good resistance to wear and thanks to their intrinsic strength, high reliability and long life.
Larger oil sump for better lubrication, strips stainless steel valve for higher output.
Cast iron shaft, dynamically balanced.
Single-phase motor with overheating thermal protection and automatic reset (three-phase motor available).
Connection to the multifunctional unit LAB 50.
Installed power 1.8 kW.
Dimensions: mm. 1070 x 390 x 800 h.
Indicative weight: 55 kg