

# FOOD & BIOTECH

**ENGINEERS (INDIA) PVT. LTD.**

CONSULTANTS

DESIGNERS

MANUFACTURERS



[www.foodbiotech.co.in](http://www.foodbiotech.co.in) / [www.Foodandbiotech.com](http://www.Foodandbiotech.com)



## **Food & Biotech**

The company is having more than 15 years experience in designing, fabrication, execution of projects on Turnkey basis in the fields of Fruit and Vegetable, Dairy, Food & Biotechnology (Herbal extractions) industries.

Food & Biotech has successfully executed Fruit and Vegetable concentration plants.

## **Process Line For Fruit Pulp / Juice**

In this section, the fruits are inspected, sorted and washed. The fruits are transferred to the Roller Conveyer so that the rejected fruits are removed manually. The sorted fruits are transferred in to the washing machine where the fruits are washed by clean water.

### **Pulping Section**

The fruits are then subjected to peeling, cutting and transferred to pulping section by using slat or bucket elevator. The peeled and cut fruits are passed through coarse and fine pulper to give good quality pulp by separation of juices and seeds. The fine pulp is collected in tanks and fed to the processing section.

### **Process Section**

The fine pulp is then pasteurized. The pasteurization is done either through Tubular/ Spiral flow type / Scrapped surface heat exchanger. The Hot pulp is then fed to the filling / packaging section.

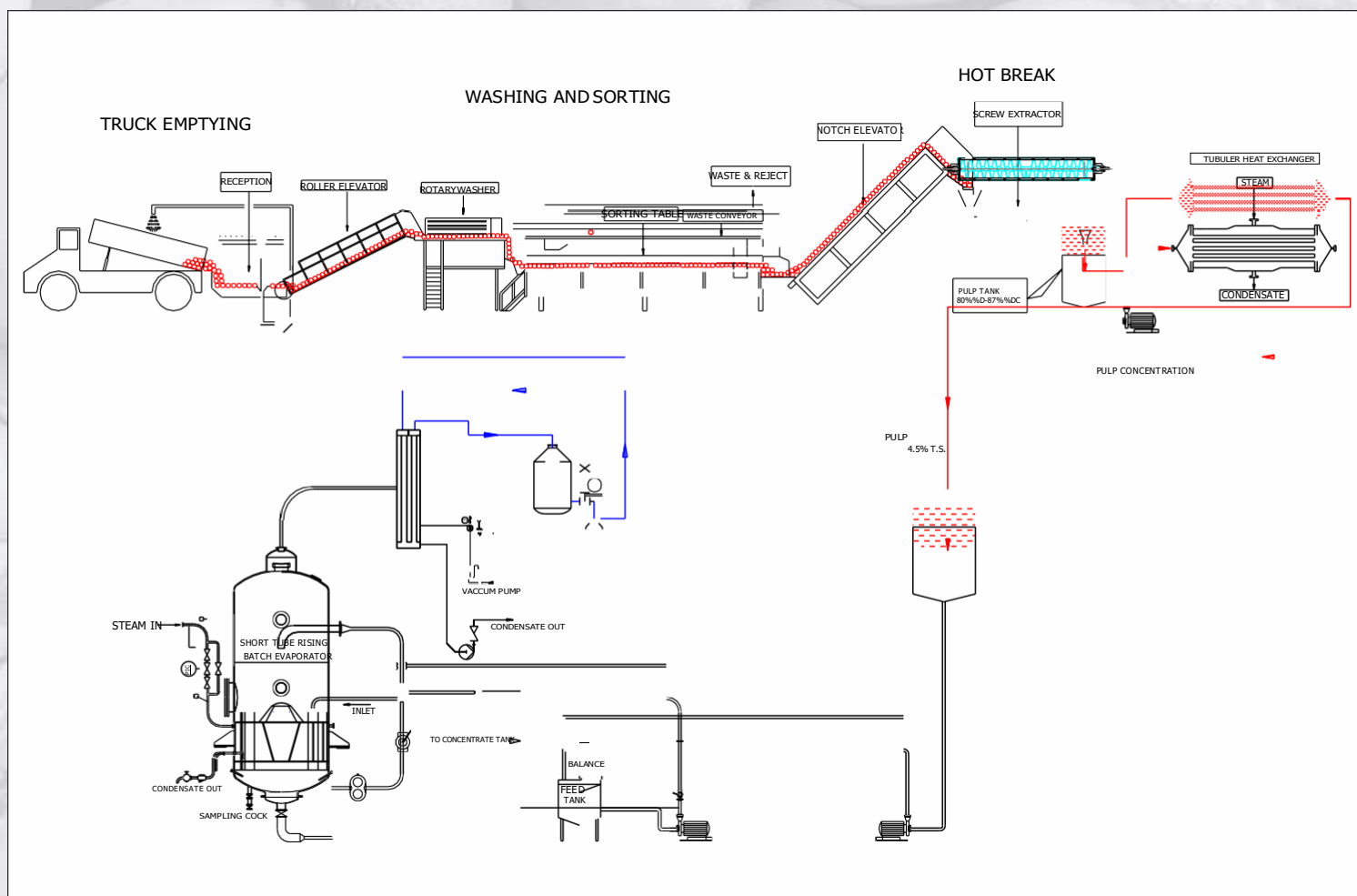
### **Packaging Section**

The pulp is filled to the cans through Rotary pump filler/Vacuum Filler. This section is also consists of equipments like can seamer, body reformer, can lid bidding, hand flanging and date embossing machine. The filled cans are fed into retorts to sterilize the products.



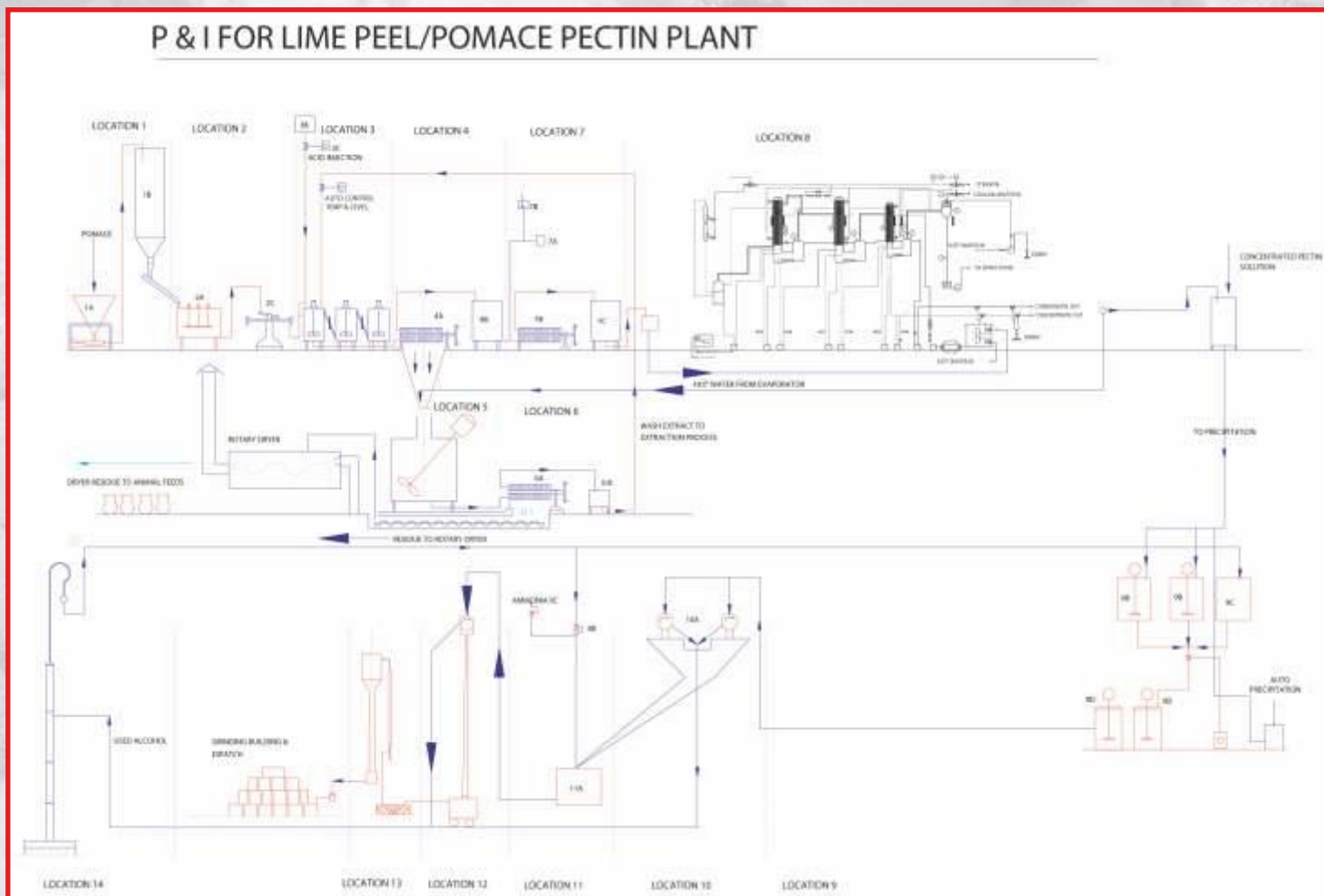


## P&I DIAGRAM - FRUIT AND VEGETABLE





## Pectin (Lime / Pomace) Line



## Lime / Pomace Pectin Processing Line

### Washing, Crushing & Processing

Lime fruits, pomace washed in washing tank or in running water spray. After washing the fruits are crushed to juice & peel. After thorough washing, Pomace is processed to remove excess water content.

### Drying Process

The Lime Peels and Pomace are dried in continuous hot air bins to have safe moisture level to store for further use.

## Extraction Process( Dry & Wet )

Material is extracted by using chemicals & require heat treatment under controlled pH.

## Clarification or Demineralization

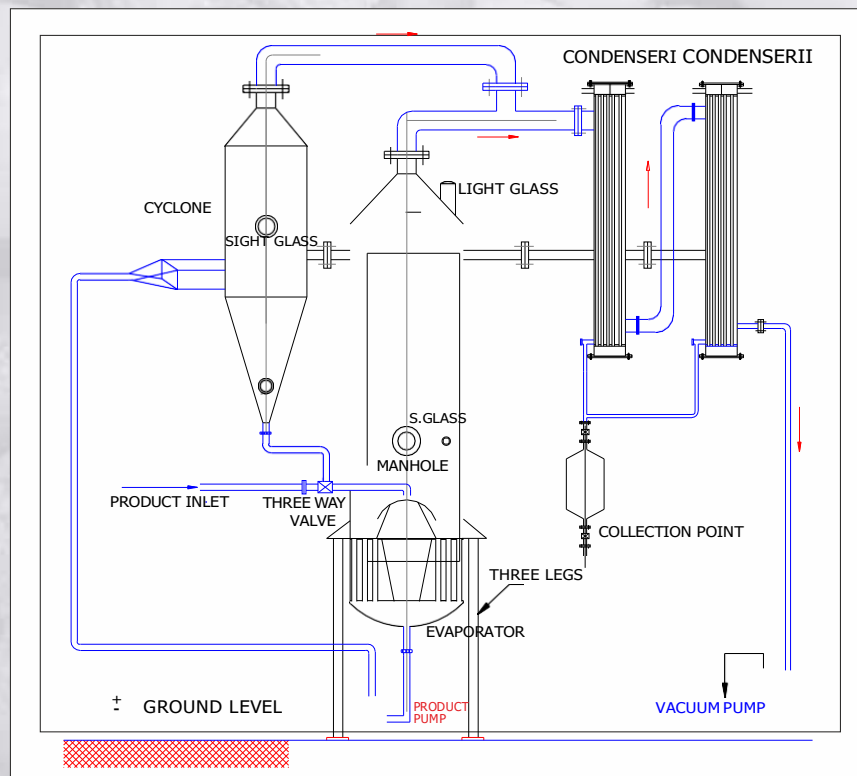
The filtrate passes through various stages to get clarified & de-colored Pectin solution.

## Precipitation:

Precipitation is done by adding alcohol to the concentrated material.

## Drying, powdering and Grading

### AROMA RECOVERY SYSTEM



Most of the organic components of flavors have low boiling point hence, during process due to high temperatures this flavor components are lost causing loss in flavor of the final products. Recovery System is necessary initially to recover all flavor components and add back to the final product to retain the natural flavor.

### Application of Aroma Recovery System:

Fruit Pulps

Beverages (Coffee)

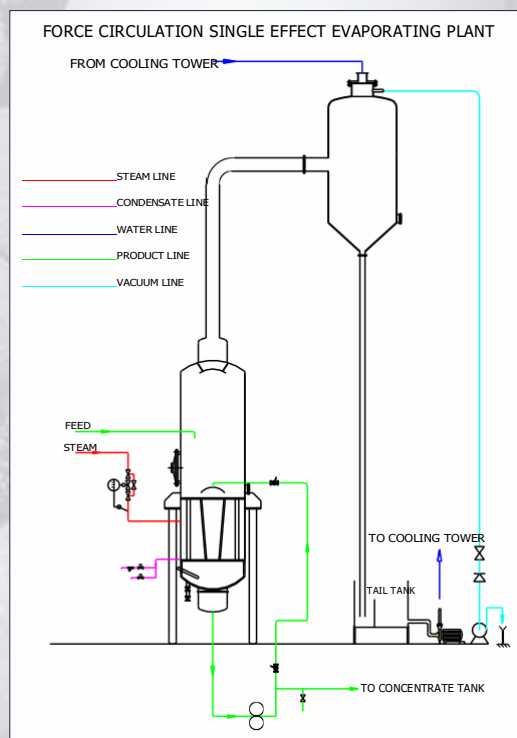


# Juice Concentration System

## Vacuum Pan Evaporator

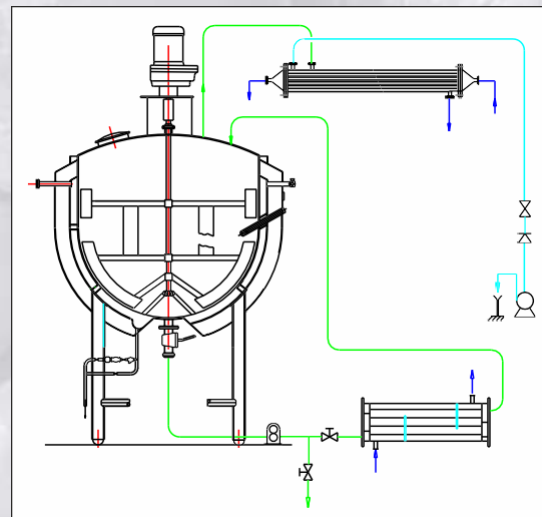
It consists of heating surface, vapor space, entrainment separator, condenser and vacuum pump. It also consists of various accessories so as to increase the efficiency of the system. Used for the concentration of products to high viscosity

### P&I DIAGRAM



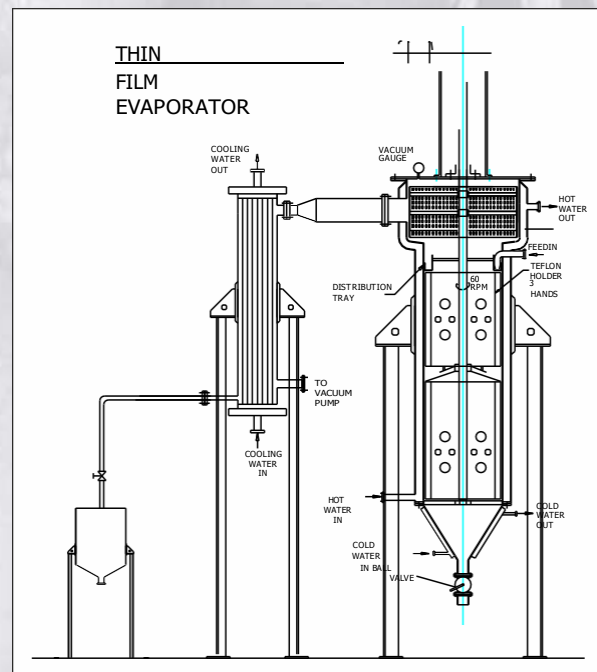
## Thin Film Evaporator

Applicable to high viscous fluid of fruit pulp and herbal extracts, having falling film type with high speed rotary blades to remove product continuously from the surface of walls. Various models and capacities are available.



## Short tube rising type evaporator

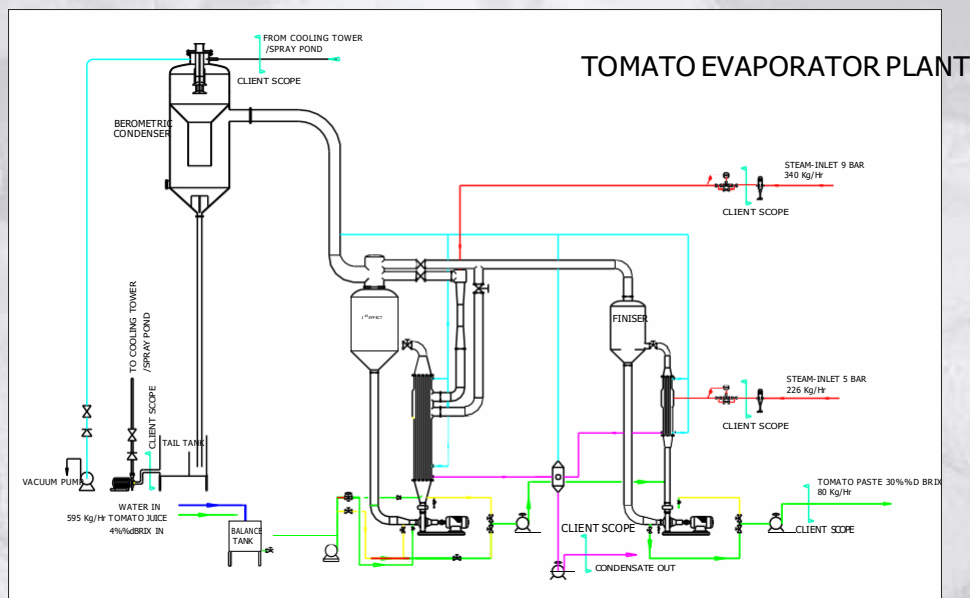
This type of evaporator is useful for High Viscous pulps & Juices. The calandria with short tubes are provided with vapour space, connected through duct to vacuum system to remove the vapours at regular intervals, to pass through Shell & Tube or Barometric condenser. It is also provided with Digital indicator to indicate Temperature, Gauge to indicate Vacuum and manhole for regular maintenance.



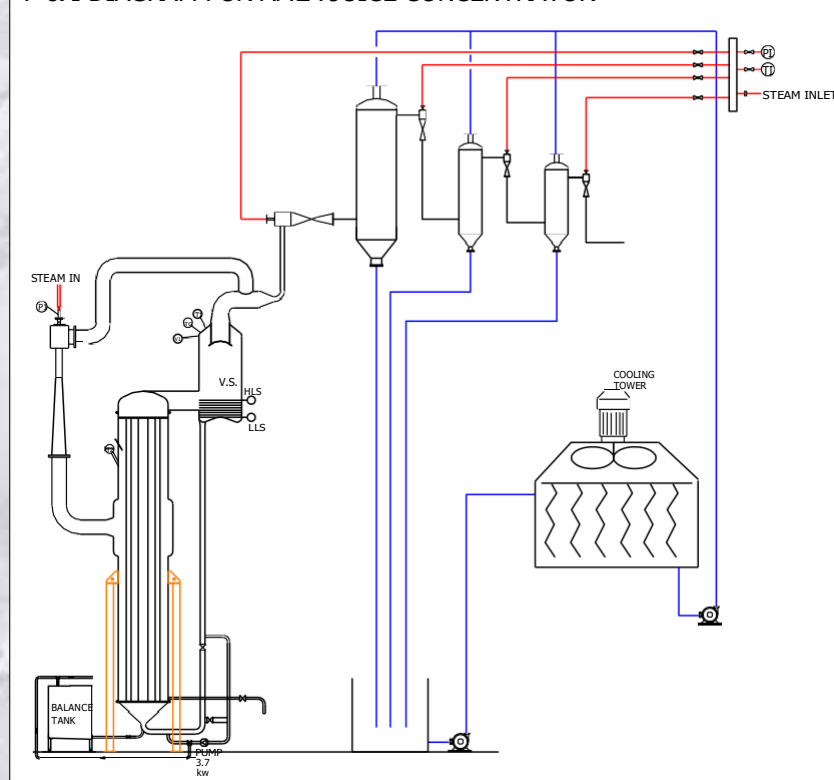


## Rising Film Evaporator

These types of evaporators are used where highly viscous materials are to be concentrated. Feed is fed from bottom and the concentrate removed continuously. Product rises in the tube driven up by vapor bubbles from the boiling liquid. Mixture of vapor and concentrate overflow at the top into the vapor separator. Temperature difference between the steam space and evaporator space is large and product is returned by means of circulation tubes. Biggest advantage of this evaporator is frequent cleaning of the tubes are not required. Burning of the product is eliminated. However average residence time of the product is relatively long



P & I DIAGRAM FOR AMLA JUICE CONCENTRATOR



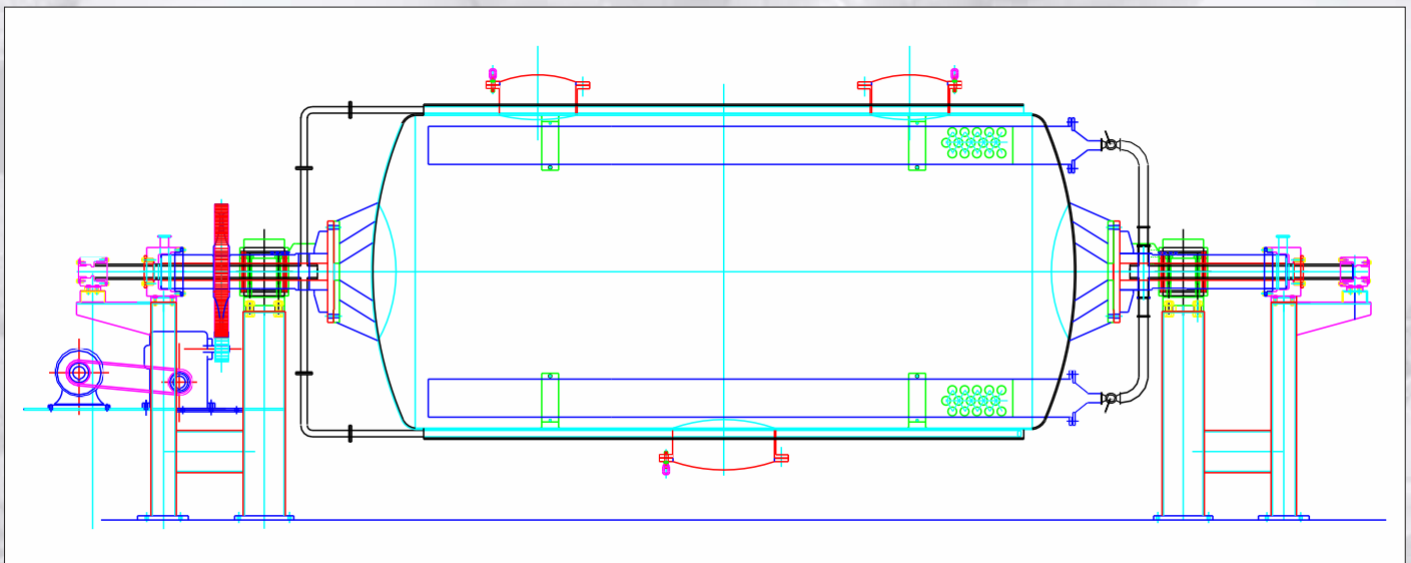
## Amla Juice Concentrator

Amla fruit juice is rich in ascorbic acid and is thermo liable hence, the design parameters are taken into consideration to safe guard the characteristics of amla to run the system at low temperature.



## Rotary Extractor with liquid Concentration system cum Solvent Recovery Unit.

Herbal / other products are extracted from leaves, roots, bark and continuously removed through the compressed air pressurization system. Also desired temperature for efficient extraction is maintained using controlled steam indirect heating. Extracted liquid are concentrated in rising type evaporator or wiped film evaporator and spray dried or vacuum tray dried. Solvent is recovered and purified by distillation for further use.



Rotary Extractor

## DEHYDRATION LINE OF FRUIT & VEGETABLES

### Process:

#### Washing & Sorting:

The Fruits / Vegetables are thoroughly washed to remove dirt, sorted to separate spoiled & damaged one.

#### Blanching:

After cutting the fruits/vegetables are dipped in hot water either containing Sodium Chloride, or any other chemical to avoid enzymatic action, thus, safeguard the quality of product. Remove excess water before keeping in oven for drying.



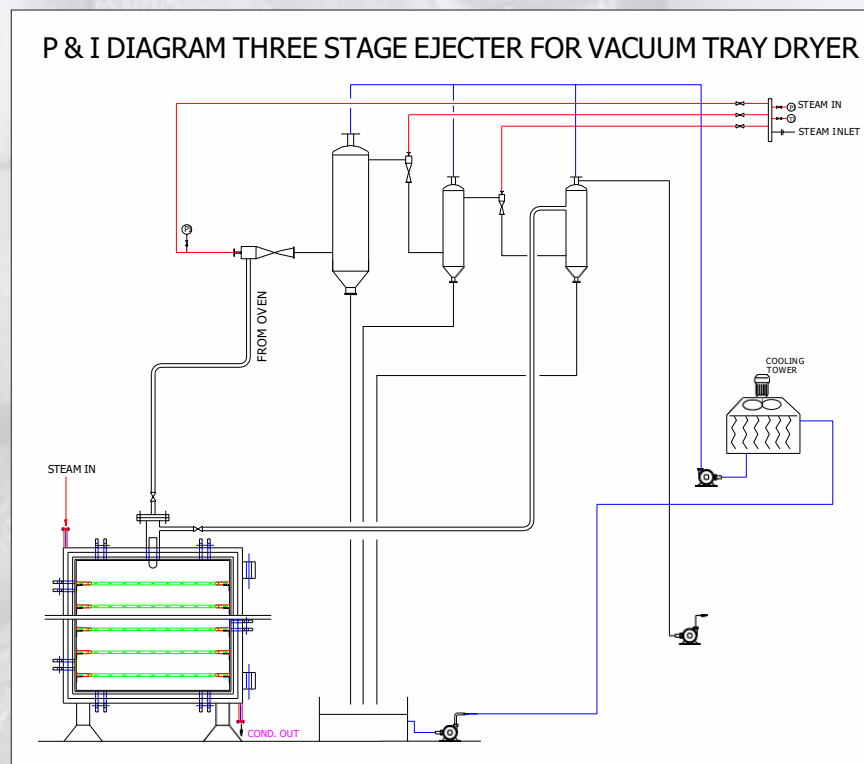
## Drying/Dehydrating

The fruits/vegetables are then placed in the dryer. The dryer used for the purpose depends on the type of product to be dried and the final product desired.

**Types of dryer used are:**

**Vacuum Tray Dryer of various capacities**

**Heating Media: Steam/Thermic Fluid**



**P & I DIAGRAM FOR VACUUM TRAY DRYER**

### Oven Tray Dryer:

Dryer specially designed for drying fruit & vegetables in vacuum system. The fruit/vegetables of desired quality are placed on the trays. The trays are then placed on the platten of the dryer. The steam flows inside the platten and the desired temperature is maintained. The process is carried out in vacuum. The dried material removed and packed as it is or grinded to powder before packing.

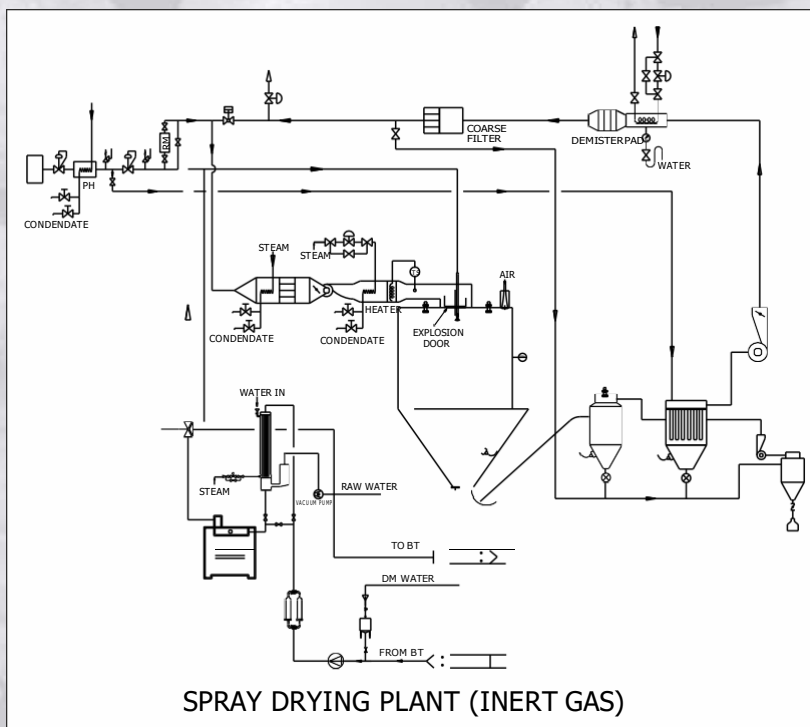
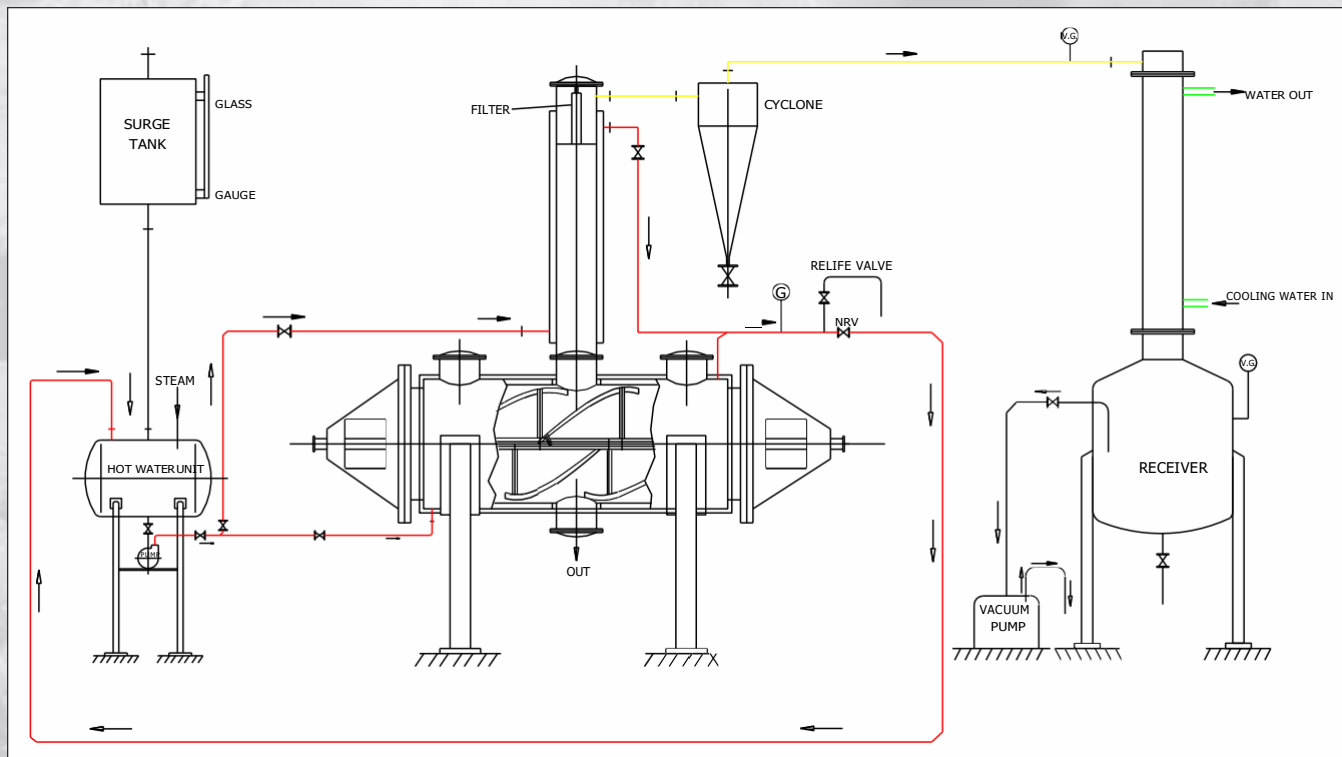
#### Advantages

- Low temperature
- Safeguard characters of fruit and vegetable
- Greater ascorbic acid retention



## Horizontal Vacuum Dryer

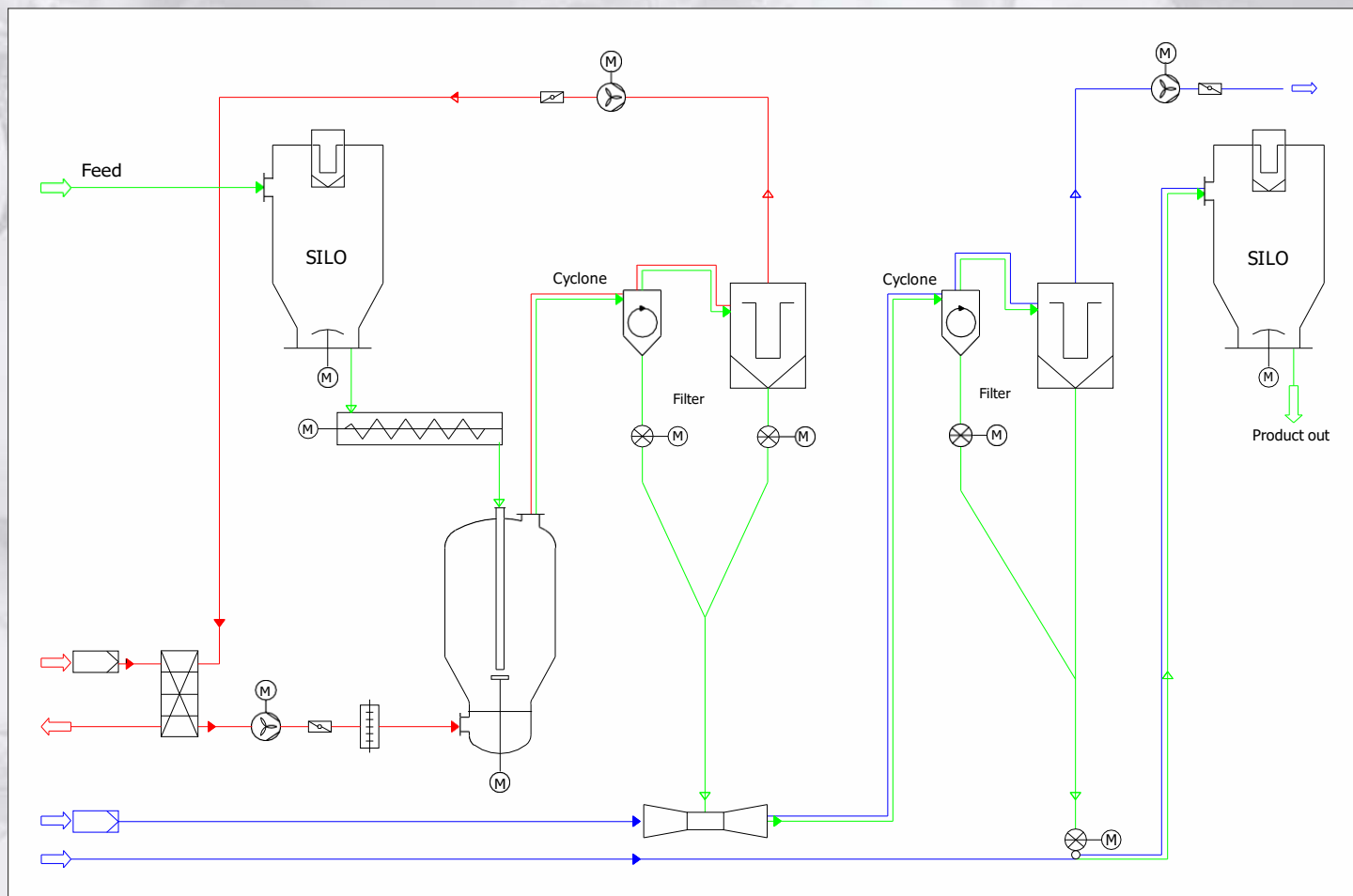
Normally these driers are batch size in nature, consists of cylindrical shell mounted horizontally in which a set of agitator blades mounted on a revolving shaft stirs the solid being treated. Heat is applied by circulation of hot water or steam. The blades are very close to body so as to scrape the product not allowing sticking to the dryer. Vacuum is created and maintained by any of the conventional methods.



## Spray Dryer

Single stage spray dryer with fireproof system. Spray Dryer is designed and provided with fireproof accessories (inert gas) completely automatic system to meet any eventuality of fire hazard of any natural in spray dryer.

## Agitated Flash Dryer



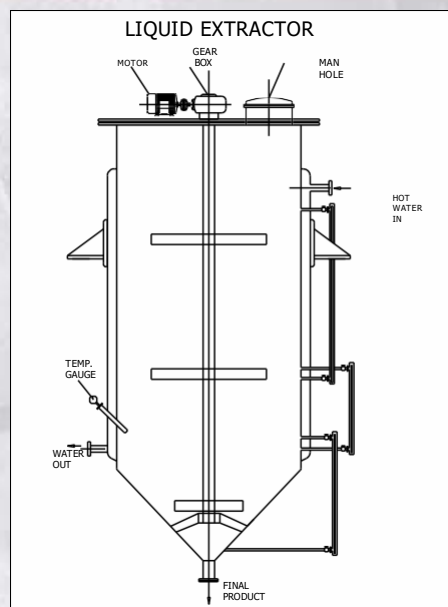
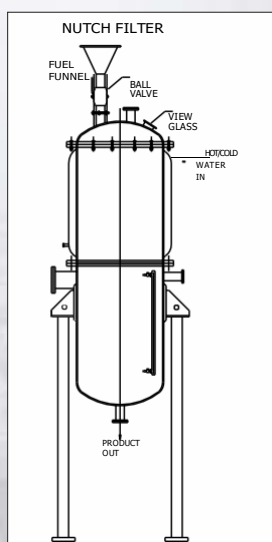
Specially designed dryer for the product like pharmaceutical grade product, Starch powder, glucose power, etc. Design capacities vary as per the requirement.





## Liquid Extractor

Liquid Extractor is made from SS 304 /SS 316. A set of agitating blades is mounted on a shaft rotated by gear motor. Liquid extractors are mainly used for the proper mixing of products and solvent in order to achieve phase mixing and also the product can be heated or cooled by jacket as per the requirement to improve the coalescence. Liquid Extractors are used to separate water, product, and solvent by settling down the product after mixing.

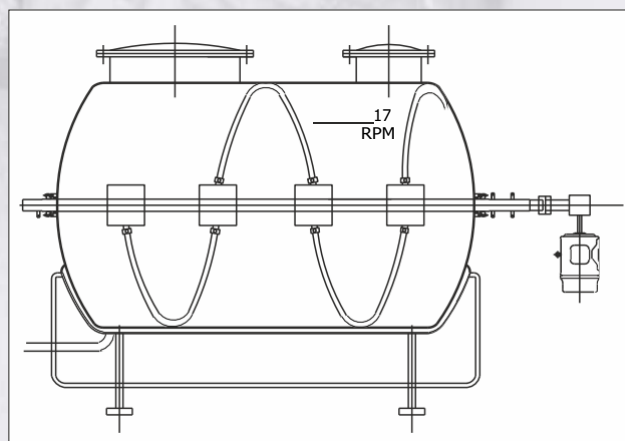


## Nutches Filter

Constructed either with SS 304 & SS316. It has a perforated filter plate at the middle. It is mostly used for filtering the herbs products. Heating and cooling is also possible through the jacket for the proper filtration and separation of product from impurities and leaves roots, etc.

## Crystallizer

A crystallizer is an equipment in which environment is created suitable for the formation and growth of crystalline materials. Paramount in the design of such equipment is the means, which are chosen to create super saturation at a temperature level, which produces a desired or proper hydrate or composition of the product crystals. For materials of very steep solubility cooling type crystallizers are used and for the materials with normal but moderate slope many choices are available like evaporative cooling, surface cooling, and constant temperature evaporation.





## Washer

Suitable to wash fruits and vegetable with agitation action with roller conveyers. Various models and capacities available.



## Fruit Mill

Multi purpose, fully automatic machine suitable for crushing hard fruits eg. Pine apple, Leafy Vegetables. All contact parts SS 316 to SS 304



## Double stage Pulper

Applied to separate fruit pulp to peels.  
Stainless steel Body  
Suitable Drive  
Nylon Fibre Brushes, SS perforated mesh  
Capacity: 50 kg/hr to 15MT/hr.



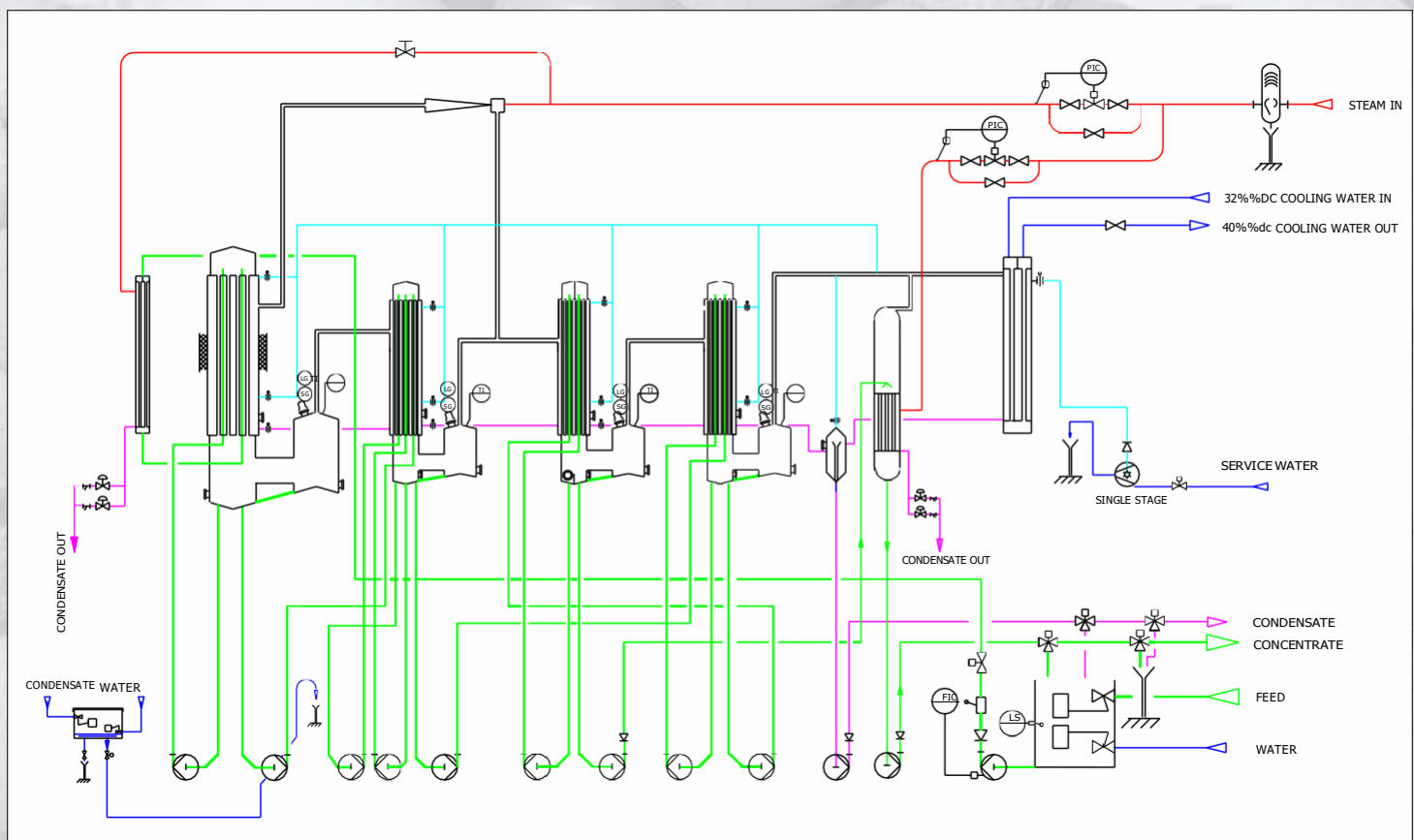
## Jacketed Steam Kettle

Available in both tilting and stationary type models of different capacity. equipped with steam safety valve temperature gauge, pressure gauge.





## Evaporating Plant for Industrial Effluent suitable for Fruit Juice Processing & Other Industries



To recover organic matter and to have zero discharge effluent system. Water recovered through this system can be reutilized for processing and other purposes, eliminating discharge problems.





## **Food & Fruit Sector**

- A) Dextrose & Sorbitol plant
- B) Liquid Glucose Plant
- C) Tomato juice & tomato powder plant
- D) Orange juice / Lemon Juice Plant
- E) Onion, Chilly, Ginger etc Powder Plant.

## **Biotechnological Plant**

- A) Pectin Powder Plant
- B) Lemonin oil Extract plant
- C) Citrus Powder Plant
- D) Neem Powder & Neem Oil Extract Plant
- E) Oleoresin Extract plant
- F) Musli ( Natural Viagra ) Extract Plant

## **Our Strength**

We have more than 200 Customers in Domestic and overseas

Excellent sales & service Network

Export to Bangkok, Malaysia, Dubai, Iran, Bangladesh, Canada  
Croatia & China

**We also under take  
Designing & Fabrication  
of following Equipment**

- 1) Milk Storage Tanks
- 2) Powder Storage Tanks
- 3) Road Milk Tankers
- 4) Ribbon Blender
- 5) Powder Sifter
- 6) Ejector Fabrication
- 7) Screw Conveyors
- 8) Union, Valves & NRV
- 9) Milk Pumps
- 10) Powder Grinder
- 11) Wiped Film Evaporator
- 12) Roto Therm Evaporator
- 13) Crystallizer
- 14) Rotary Extractor
- 15) Turbo Blender
- 16) Bulk Milk Cooler
- 17) Khoa Pan ( Steam Heated )
- 18) Thin Film Evaporator
- 19) Molecular Sieve Dryer for Solvent
- 20) Solvent Fractionation Column
- 21) Multi purpose Solvent Recovery Plant
- 22) Vacuum Tray/ Shelf Drier
- 23) Vacuum Deaerators



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