Spray Continuous Pan (SCP®)

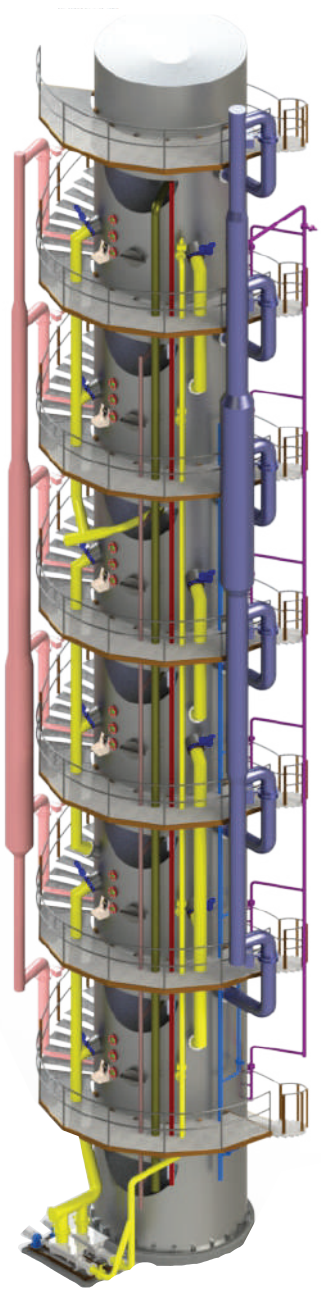
"Sugar crystallization using low temperature vapour (65-75°C)"

- Suitable for all Massecuites application ('A', 'B', 'C', Raw & Refined).
- Energy efficient sugar crystallization.
- Reduced colour formation during crystallisation.

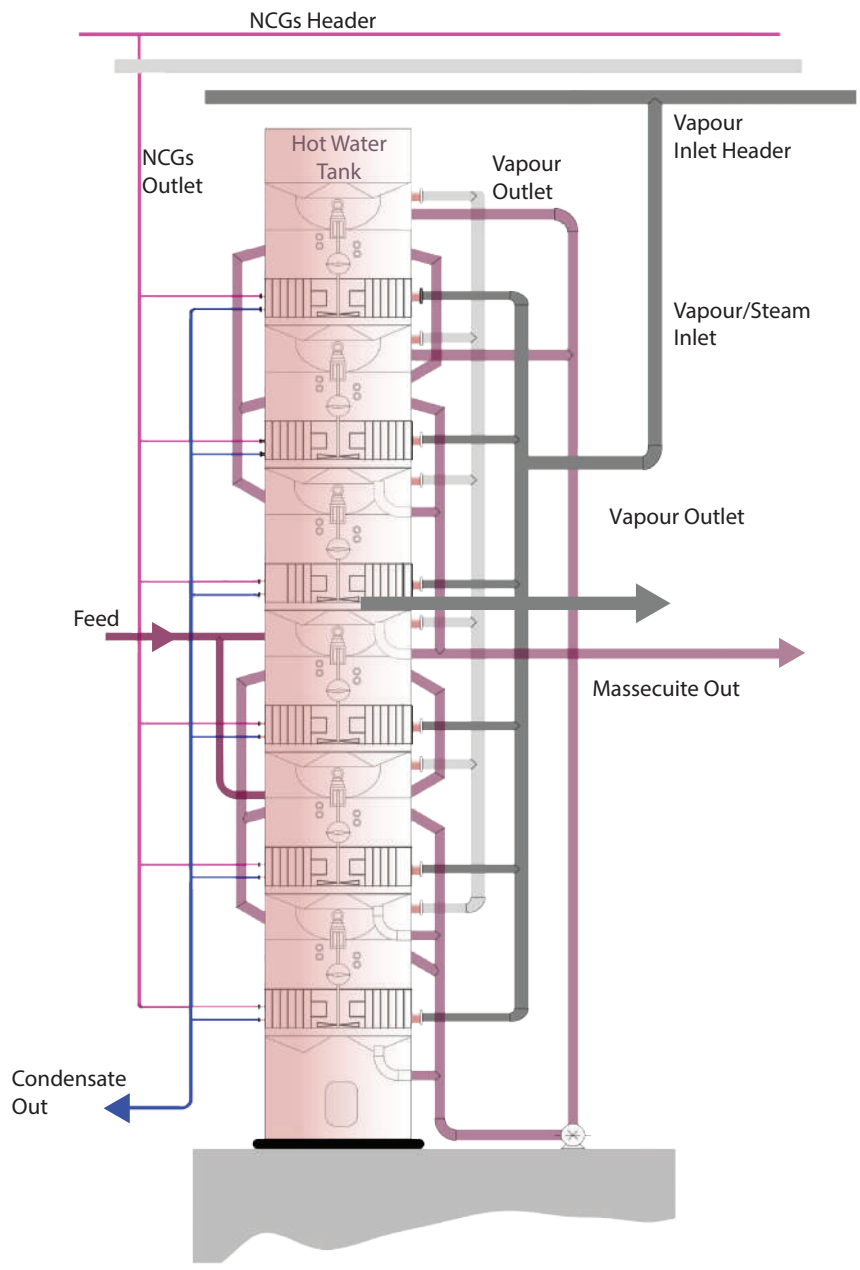
Spray Continuous Pan (SCP®) is efficiently developed for uniform and continuous crystallization of sugar solutions with highest efficiency without any compromise on the process parameters. It has opened the gateway to maximum steam economy by minimizing the demand of pressure and ΔT.

DISTINCT FEATURES:

- Operates at very low ΔT (5-15^{0}C).
- All massecuites application (Refined, Raw/A, B and C).
- Lowest conglomeration and false grain formation.
- Efficient forced circulation.
- High flow impeller negates the viscosity effect and helps in least color inclusion.
- Higher crystal growth even for "C" massecuite.
- Minimal dry seed generation and its use for seeding.
- High steam economy by use of high syrup brix and low temperature vapours.
- Self-supporting structure with minimum foot print area, resulting in reduced capital cost.
- Fully automated process monitoring and control system.
- Continuous operation with online cleaning arrangement.
- Honeycomb calandria for improved circulation and elimination of dead areas.
- Devised with variable speed circulation provides flexibility in process and optimizes power consumption.
- Patented process and design technology.
- Massecuite out by gravity to the pug mill.



Isometric View



Process Flow Diagram

PERFORMANCE PARAMETERS:

Particulars	Parameters
Total height of SCP®	25 - 35 m
Diameter of Calandria	≤4.5 m
Heating Surface per chamber	250 - 750 m^2
No. of chambers	3 -7 Nos.
Provision for graining	2 chambers
Total holding volume per chamber	≤ 50 m^3
Designed heating steam temperature/pressure	65-75°C / 25-40 kPaA
Designed outlet vapor temperature/pressure	45-60°C / 10 -20 kPaA
Feed liquor concentration	60-80 % Total Solids
Effective temperature difference between boiling	10-20°C
Crystal content range	30-60%
Massecuite out	By gravity to pug mill

BOILING TIME

Massecuite	Growth Rate	Target Growth	Time Required
Raw "A" Massecuite	240-360 µm/hr	500-1000 µm	2.5-3.5 hrs
Raw "B" Massecuite	90-180 µm/hr	250-500 µm	4.5-5.5 hrs
Raw "C" Massecuite	30-150 µm/hr	150-350 µm	6-7 hrs
Refined "R" Massecuite	480-550 µm/hr	600-2000 µm	2-2.5 hrs

ADVANTAGES

PROCESS ADVANTAGES:

Better Massecuite Quality : Uniform residence time for seeds, mechanical circulation, proper super-saturation control and gradual brix increase in each chamber results in least crystal size variation.

Improved Sugar Recovery : Better exhaustion and higher crystal content of the mother liquor; therefore, maximum extraction and low purity molasses.

Improved Evaporation and Crystallization Rates with Low Temperature / Pressure Vapours : Honeycomb calandria design and efficient mechanical agitator improves circulation, evaporation and crystalisation rate. This also reduces incrustation, colour, conglomerates & uneven heating.

Continuous Operation with Online Cleaning : SCP® has facility to bypass any chamber for cleaning without reducing its capacity. Online cleaning results in continuous operation & 100% availability with better productivity & quality.

Lesser Hydrostatic Effect : Effect of hydrostatic head is largely negated through efficient mechanical circulation and use of honeycomb calandria with optimum tube length.

Provision of Seed Pan with Uniform Seeding : A provision of seed pan is made in the SCP®. A Separate flexible control for the seed pan has been provided to ensure uniform seed seizing and feeding.

Availability for all Process Ranges : SCP® is available for all process ranges with customized parameters involved, depending upon the requirement.

STEAM & POWER ECONOMY/ENERGY EFFICIENCY:

Steam Economy : Designed to operate with low temperature vapors ensures process steam economy.

Power Economy : Low operating power required due to planetary drive circulators with VFD.

DESIGN ADVANTAGES:

Compact Modular Single Tower Design : SCP® has number of crystallization chambers in a single tower.

Honeycomb Calandria : Inclusion of honeycomb design in the heating chest leaves no space for settling of sugar. It also improves circulation rate due to reduced friction.

Complete Instrumentation : Self-sufficient automation system requires least manual intervention.

Stainless Steel Wetted Parts : All essential wetted parts inside the chambers of SCP® in direct contact with massecuite / sugar solutions are either made of or lined with stainless steel to reduce color formation and improves equipment / component life.

Light Gauge Self-supported Structure : It has light gauge steel structure for platform and stairs are supported on the tower itself.

Vertical Installation : No requirement of building / shed or extra steel structure. Self-supporting structure decreases structure/ & civil cost. Less floor area is required due to vertical tower construction.

CONTROL ADVANTAGES:

The control scheme of a continuous pan is quite different from a batch type pan. SCP® has all essential instrumentation that gives flawless performance.

- Ease of operation.
- Provision for flow, temperature, pressure, level and consistency measurement for each chamber.
- Process parameters control for individual chambers.
- Auto cleaning / rinsing cycle of valves & sensors to minimize shutdowns.
- Seed / Feed ratio control for least crystal variation.
- Individual control of vapor in and out to achieve consistent boiling.

70+

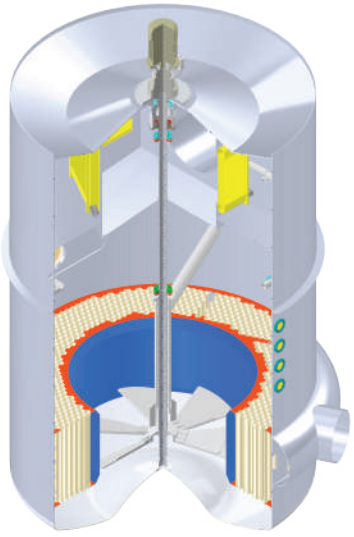
Installations

OPERATIONAL ADVANTAGES:

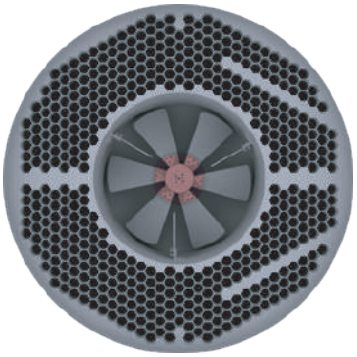
- Continuous operation with no stoppages.
- Fully automated intelligent system resulting in less skilled manpower requirement.
- Fast remedial action conserving product quality, saving process time & resources.
- Internal buffer capacity and continuous operation reduce massecuite storage requirements.

MECHANICAL CIRCULATOR

DISTINCT FEATURES:

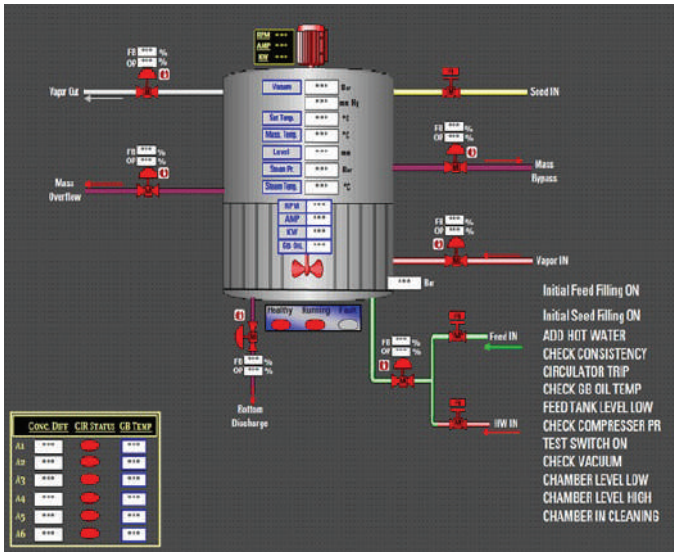


- Enhanced circulation capacity due to more number of blades.
- Reduced/Minimized boiling time.
- Variable speed circulation compatible with crystallization rate trend.
- Uniform circulation and better heat transfer rate.
- Uniform and improved crystal size with sparking luster.
- Reduced centrifugation time and wash water quantity.
- Unique compact design mechanical circulator.
- Lower hub size with higher sweeping volume.
- Easy installation due to direct mounting without any structure or platform.
- Highest efficiency with inline planetary drives.
- High quality mechanical seals.
- Having high efficiency to protect any air/fluid leakage.
- Suitable for high temperature and pressure conditions with extended life and low maintenance.
- Detachable impeller blades for additional flexibility.
- Low power consumption.
- Fully automated control system.
- Patented technology.

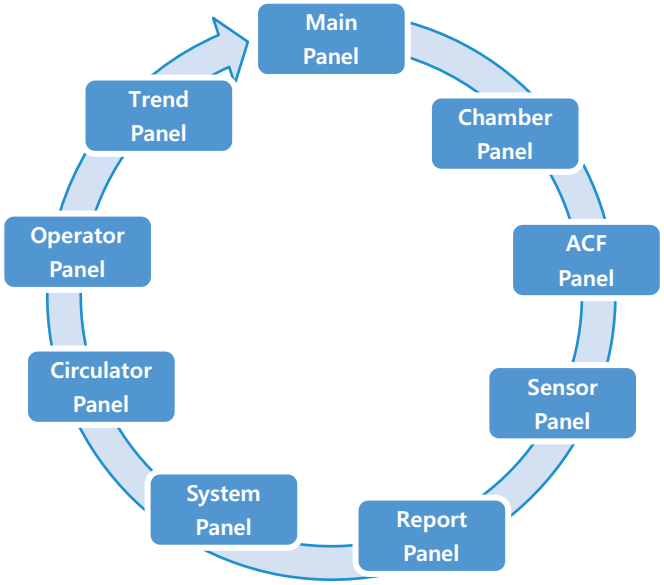


AUTOMATION

- All important & critical process parameters are measured and controlled.
- Each and every valve is Automated.
- No pan man is required for actual operation of the Pan.
- Only one person is required for monitoring the operation.



Fully Automatic Operation



SED

INNOVATIVE TECHNOLOGIES FOCUSED ON SUSTAINABILITY

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