

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

SPRAY CONTINUOUS PAN (SCP)



FARAN SUGAR MILLS LTD.



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Introduction

Vertical continuous pans from SCP has developed to ensure maximum exhaustion of massecuite. It helps in crystallization and reduced the purity of molasses & quantity. In this boiling system the ratio of feed and seed will be so precise that the formation of false grain will nearly eliminated. This ratio is maintained by the help of flow measuring on both feed & seed supply and the cubical growth of the crystal in each chamber. FSML is the second Sugar Mill in Pakistan where SCP has been installed. To get maximum advantage from SCP boiling system one should ensure following parameters

No.1 Regular consistent supply of vapors.

No.2 Regular removal of NCGs from the SCP system.

NO.3 Precise, regular and un-interruptable supply of seed and feed.

No.4 Maintain seed feed ratio 35 to 40 % . Depends upon the MA of the final product.

No.5 Best quality sensors should be selected which are fully compatible with hard ware.

No.6 Whole SCP performance depending on automation. So we have to be very alert to run all automation loops trouble free. If there is any doubt of malfunctioning in any loop of automation, take necessary steps to fix it promptly,

SCP provide us multi dimensional advantages Like minimum space for installation, limited staff, power saving, high crystal content, minimum use of movement water, This one SCP unit is capable to handle 12000 TCD @ 11.5 recovery % Cane.



What is SCP

- Vertical Continuous Vacuum Pan is **Cylindrical shaped Multi Chamber construction**. All the compartments are arranged one above the other. SV ratio of SCP is (5.5)



Purpose of VKT

It allows the use of mechanical circulators ensuring excellent circulation and mixing of the massecuite. The SCP consists of superimposed crystallization chambers, i.e. it is a cascade of stirring vessels, where the massecuite flows from top to bottom by gravitational force.

Process performance parameters of SCP



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DESCRIPTION	PARAMETERS
Total height of SCP	42-45m
Dia of calandria	4.5
Heating surface per chambers	488sqm
Number of chambers	6
Provision of Seed	First Two Chambers CH: N0-1 & CH: No-2
Total Working volume per chambers	93 m ³ /h
Design heating steam temperature	93-96
Feed liquor concentration syrup	68 - 70
-Crystal content range	54 to 55



Distinct Features

- Essential wetted parts in stainless steel to reduce color addition.
- Top mounted mechanical circulator for uniform crystal size.
- Bottom consists of W Saucer to reduce the dead pocket in massecuite circulation and to ensure improved efficient massecuite circulation.
- Compact size with self supporting structure.
- Sugar yield of pan 55% - 58% concentration due to vigorous circulation.
- Honeycomb calandria for improved circulation and avoid to lumps of massecuite over calandria. Due to no ligament area over calandria tube plate.
- Flexibility to operate on overflow or bottom discharge.



Control Advantage

- Process parameters control for individuals chambers through DCS system.
- Inbuilt historic alarm historic trend and report generation provision.
- Individual control of vapor in and out to achieve consistent boiling.

Revolution of SCP



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The device works continuously throughout the season, especially with products with massecuite purity of more than 85%. The chambers are cleaned without stopping the entire apparatus. The boiling of massecuite of all stages of crystallization in SCP devices ensures a uniform operating mode. The feed compartment, allows to achieve an increase in sugar yield and helps to reduce steam consumption at the plant.



Comparison of SCP with CHP

SCP

- It is concluded that this, together with a 30% decrease in the vapor requirements, will make it possible to recover the investment in less than two years.
- For the cleaning

Continuous

Horizontal pan

Product quality variable: large variation in size of final crystals due to short-circuiting of the massecuite flow-path.



Assumptions:

Assumptions:

Average Cane crushing	10000 TCD.
Length of season in days	100 Days.
Recovery % Cane	11.00%
Molasses % Cane	4.45%
Final Molasses analysis: Brix % = 89.5 % Pol % = 32.90 Pty % = 36.76	
Cost of Bagasse	= 3500 PKR / Ton
Cost of Sugar=	80000 PKR / Ton
BMA VKT Cost in PKR(Mild Steel)=	331834060 PKR
Local SED (Pak) SCP Cost in PKR (Miled Steel)=	200000000 PKR



Saving of Power due to controlled Crystal size by seed / feed ratio

- Proper crystal size of A-massecuite will reduce 4 % of A-Massecuite % Cane as compare to A-Batch Pans
- A-Massecuite % Cane at Batch Pan = 27 % on Cane @ 416 TCH = 112.32 Tons
- A-Massecuite % Cane at VKT Pan = 23 % on Cane @ 416 TCH = 95.68 Tons
- Less massecuite % Cane need less A-Centrifugal capacity and less power
- Difference = 112.32 – 95.68 = 16.64 T/hr.
- One A continuous centrifugal of 110 KW Drive can be save.
- $110 \text{ (KW)} \times 11 \text{ (Kg Steam / KW)} \times 24 \text{ (Hrs)} / 1000 / 2 \text{ (Steam Bagasse ratio)}$
= Bagasse 14.52(M.T) $\times 2500 \text{ (Bagasse Rate)} \times 100 \text{ (Days)} = 3630000.00 \text{ PKR}$



Saving of Power Due to central condenser the water requirement is also low as compare to batch pans.

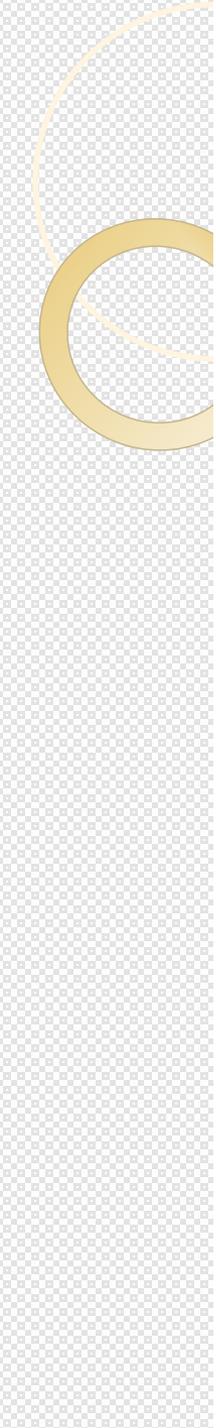
- Condenser water requirement

= vapor to be condensed $\times 50 \text{ M}^3/\text{hr}$.

- VKT condenser water requirement = $29.16 \times 50 = 1458 \text{ M}^3/\text{hr}$.

- Injection load reduced $128 \text{ KW} / \text{hr}$.

- $128 \text{ (KW)} \times 11 \text{ (Kg Steam / KW)} \times 24 \text{ (Hrs)} / 2 \text{ (Steam Bagasse Ratio)} = \text{Bagasse } 16.89 \text{ (M.T)} \times 2500 \text{ (Bagasse Rate)} \times 100 \text{ (Days)} = 4224000.00 \text{ PKR}$



**THANK
YOU**

Thank You