

Reasons & Details for Chosing SCP for A- Masecuite Boiling at FSML.

Addition of (SCP) for A Masecuite boiling is the best solution to utilize third / fourth vapors for A Masecuite.

This boiling system will provide following benefits.

1. Better steam economy,
2. Reduced molasses % as well as molasses purity.
3. Crystal size will be controlled by seed / feed ratio,
4. Due to central condenser the water requirement is also low as compare to batch pans.
5. For SCP there is no need of batch crystallizers masecuite can be pumped directly to the pug mill.

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) = 372863360.00 PKR
- Local SED (Pak) SCP Cost in PKR (Miled Steel) = 250000000.00 PKR

Better steam economy

- Vapor requirement of VKT for A-Masecuite boiling is 7 % on cane.
- For Batch Pans Steam required 10 % on cane = 41.6 t/h Bagasse required = 20.8t/hr.
- A-masecuite boiling with (VKT) will came down from 10% to 7%.

- Using 2nd vapor = $20.8/2 = 10.4$ t/hr
- For (VKT) Steam required on 07 % on cane = 29.16 t/h Bagasse required = 14.58 t/hr.
- Using 3rd vapor = $14.58/3 = 4.86$ t/hr
- Bagasse saving A Batch VS A(VKT) = $(10.4 - 4.86) = 5.53$ t/h
- Season Saving = 5.53 (Wt.Bagasse) x 24(Hrs) x 100 (Crop Days) x 3500 (Bagasse Rate PKR) = PKR 46452000.00
- One Day Saving = $46452000.00 / 100 = \mathbf{464520.00}$ PKR

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

- Proper crystal size of A-masseccuite will reduce 4 % of A-Masseccuite % Cane as compare to A-Batch Pans
- A-Masseccuite % Cane at Batch Pan = 27 % on Cane @ 416 TCH = 112.32 Tons
- A-Masseccuite % Cane at SCP Pan = 23 % on Cane @ 416 TCH = 95.68 Tons
- Less masseccuite % 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 (KW) X 11(Kg Steam / KW) X 24 (Hrs) / 1000 / 2(Steam Bagasse ratio) = Bagasse 14.52(M.T) X 3500(Bagasse Rate) X 100 (Days)= 5082000.00PKR **Per Day 50820.00**

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

- Condenser water requirement = vapour to be condensed X 50 M³/hr.
- SCP condenser water requirement = $29.16 \times 50 = 1458$ M³/hr.
- Injection load reduced 128 KW / hr.
- 128 (KW) X 11(Kg Steam / KW) X 24 (Hrs) / 2(Steam Bagasse Ratio) = Bagasse 16.89(M.T) X 3500(Bagasse Rate) X 100 (Days)= 5911500.00PKR
- **Saving 59115.00 PKR Per Day**

Saving in Power due to less connected load For SCP there is no need of batch crystallizers massecuite can be pumped directly to the pug mill.

- The connected load difference of SCP system and Batch Pan system is 92 KW / hr.
- $92 \text{ (KW)} \times 11 \text{ (Kg Steam / KW)} \times 24 \text{ (Hrs)} / 2 \text{ (Steam Bagasse Ratio)} = \text{Bagasse } 12.14 \text{ (M.T)} \times 3500 \text{ (Bagasse Rate)} \times 100 \text{ (Days)} = 34249000.00 \text{ PKR}$ **Per Day 42490.00 PKR**

Reduced molasses % as well as molasses purity.

- Quantity and purity of A heavy molasses will reduced when using VKT hence the quantity of B-masseccuite will reduced and vice versa quantity of C-masseccuite also reduced. Ultimately Final molasses % cane reduced.
- Our assumption is 0.2 % less final molasses
- Assume Final molasses % Cane = 4.45 – 4.25 = 0.2 Which will impact as fallows.
- Cane crushing of 100 days season at an average crushing of 10000 TCD = 1000000 M.T Cane.
- Less molasses produced during the season = $1000000 \times 0.2 / 100 = 2000 \text{ MT}$
- Sugar saved = $2000 \times 32.90 / 100 = 658 \text{ M.T}$
- Saving in terms of sugar saved 658 MT @ 80000 PKR /Ton = 52640000.00 PKR
- One day saving due to molasses impact = $52640000.00 / 100 = 526400.00 \text{ PKR Per Day}$

One day Saving due to the impact of Bagasse + Molasses = 990920.00 PKR

One day Saving Due to electrical saving= $5082000+5911500+4249000 = 15242500/100 = 152425.00$

Total Saving per Day in PKR = $990920.00 + 152425.00 = 1143345.00 \text{ PKR}$

Cost of the project by BMA = 1706000 Euro.

Cost of BMA project in PKR = $218.56 \times 1706000 = 372863360.00 \text{ PKR}$

Payback period = $(372863360 / 1143345) = 326.11 \text{ Days.} = 3.26 \text{ Seasons}$

Option No.2 Local Fabrication SED Pak

If the cost of project is 250000000 PKR

Payback period = $(25000000 / 1143345) = 218.65 \text{ Days.} = 2.18 \text{ Seasons}$

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