

Advanced heat exchanger and evaporation technology in the cane sugar industry

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GEA Ecoflex GmbH, ISSCT August 2014

GEA Heat Exchangers

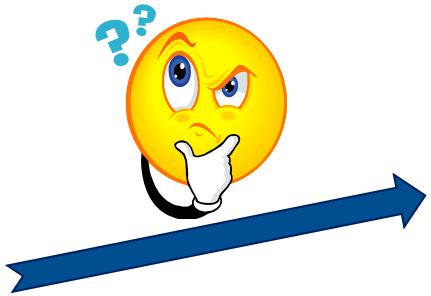
Outlook of the sugar market

Main goals:

- Increase the capacity of your sugar mill
- Increase the quality of your sugar
- Lower the production costs of your sugar mills

→ BE PREPARED FOR THE FUTURE!!!







Agenda

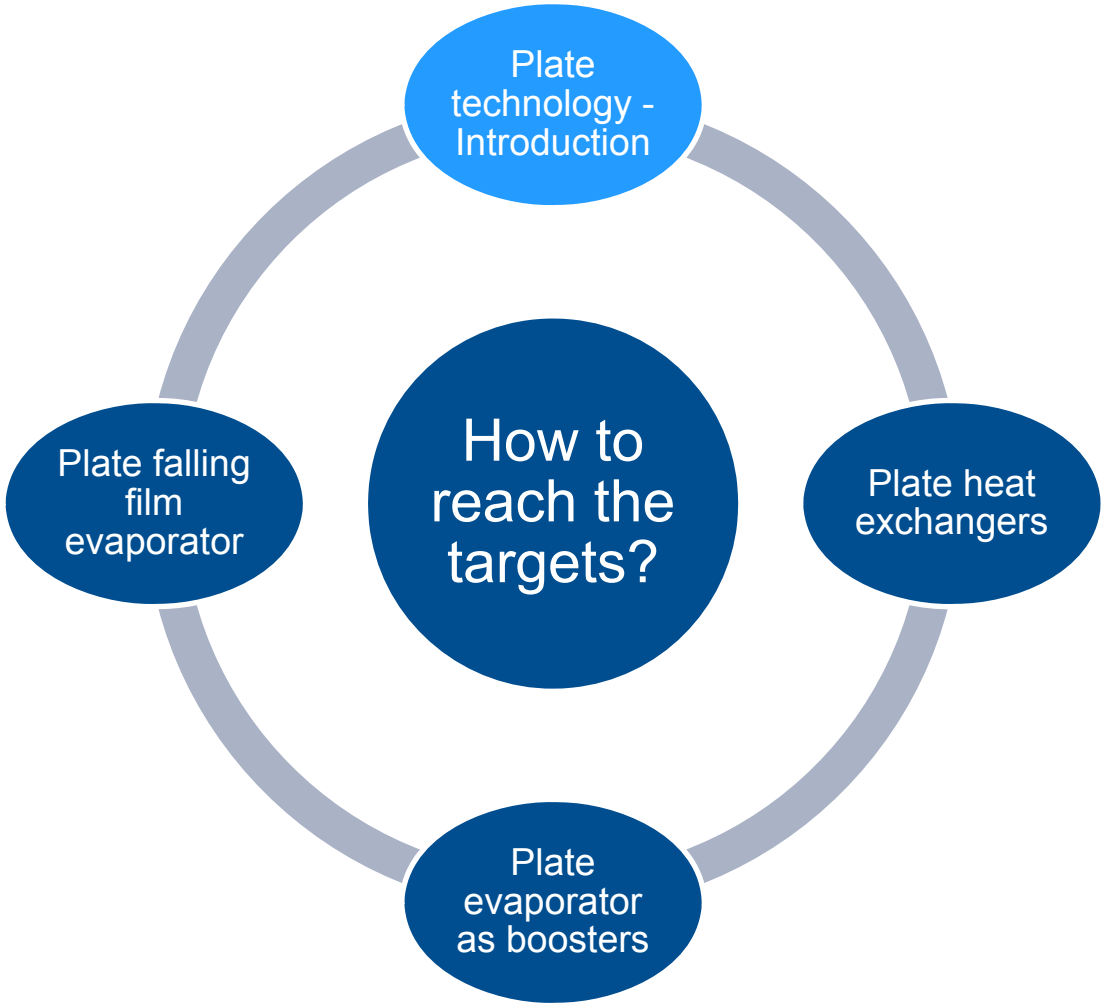
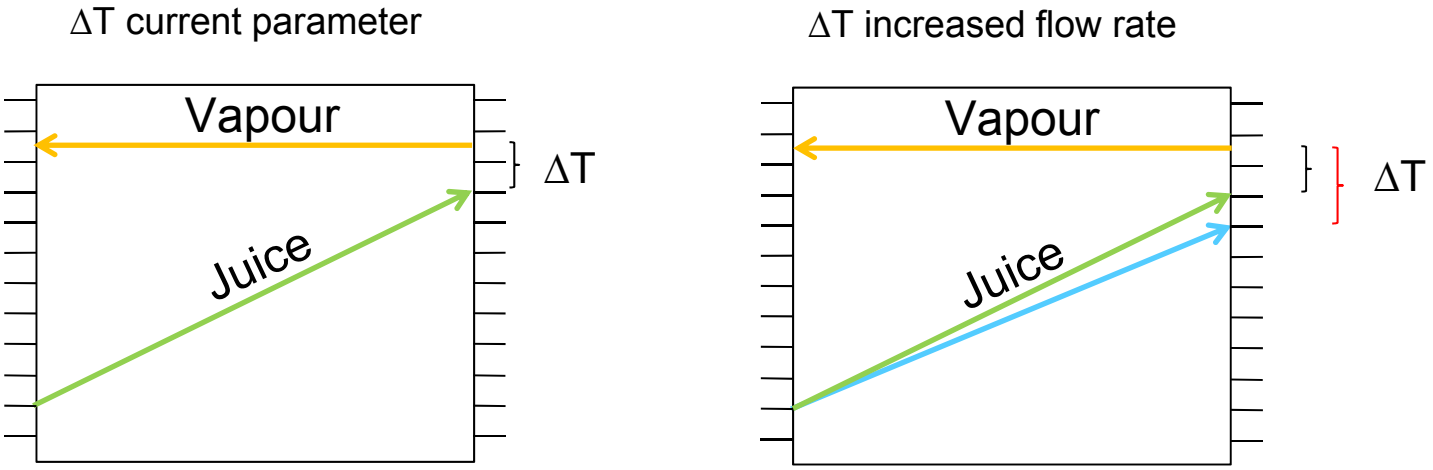

Plate technology - Introduction
Plate heat exchangers
Plate evaporator as boosters
Plate falling film evaporator
How to reach the targets?

Plate technology Introduction

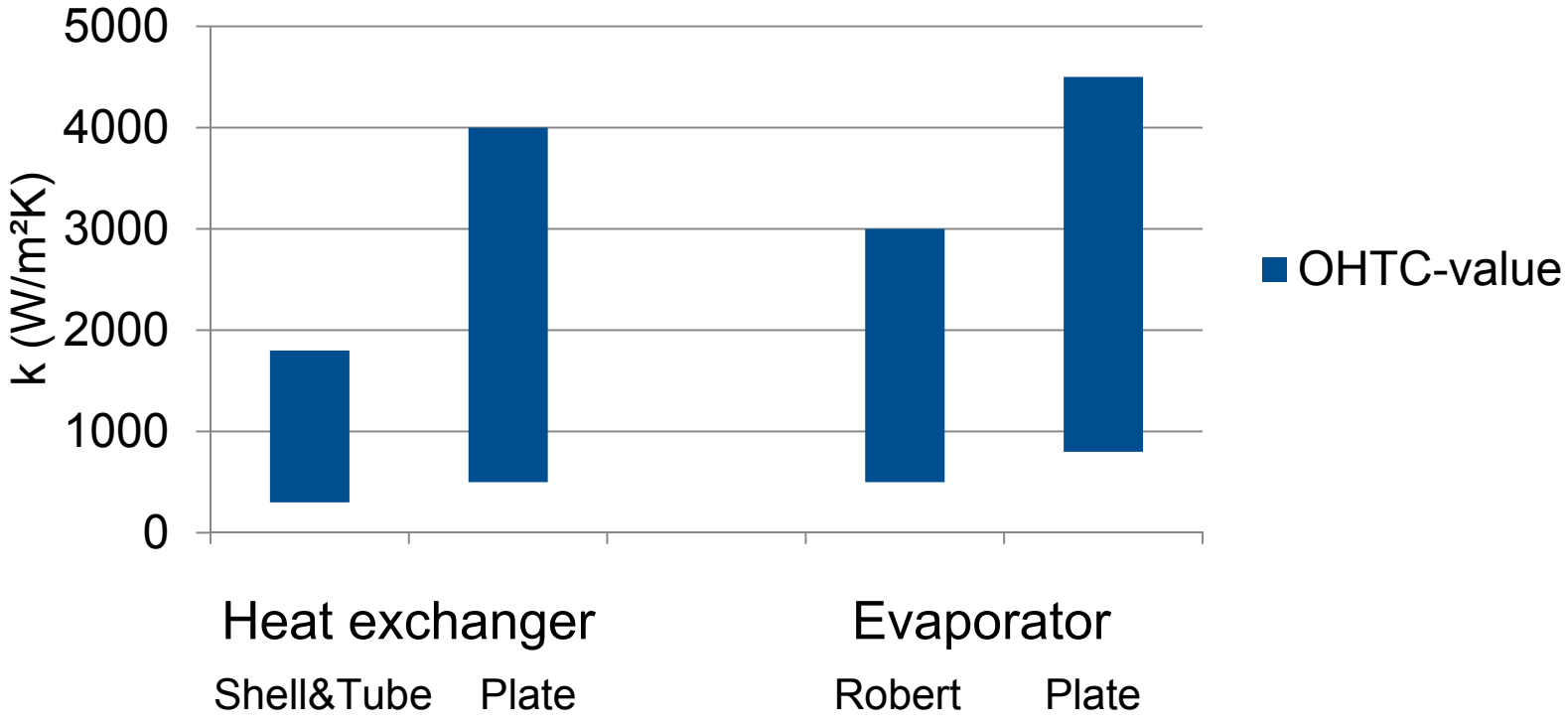
Temperature profile within existing heat exchangers at increased juice flow



Possible Consequence	Leads to
Lower juice outlet temperature	Higher energy consumption & cost within evaporation
Increased vapour temperature	Decreased quality due to colorization

Plate technology Introduction

Thermal efficiency of plate type heat exchangers and evaporators is superior to each kind of tubular design



*according to VDI-Wärmeatlas and measurements at site

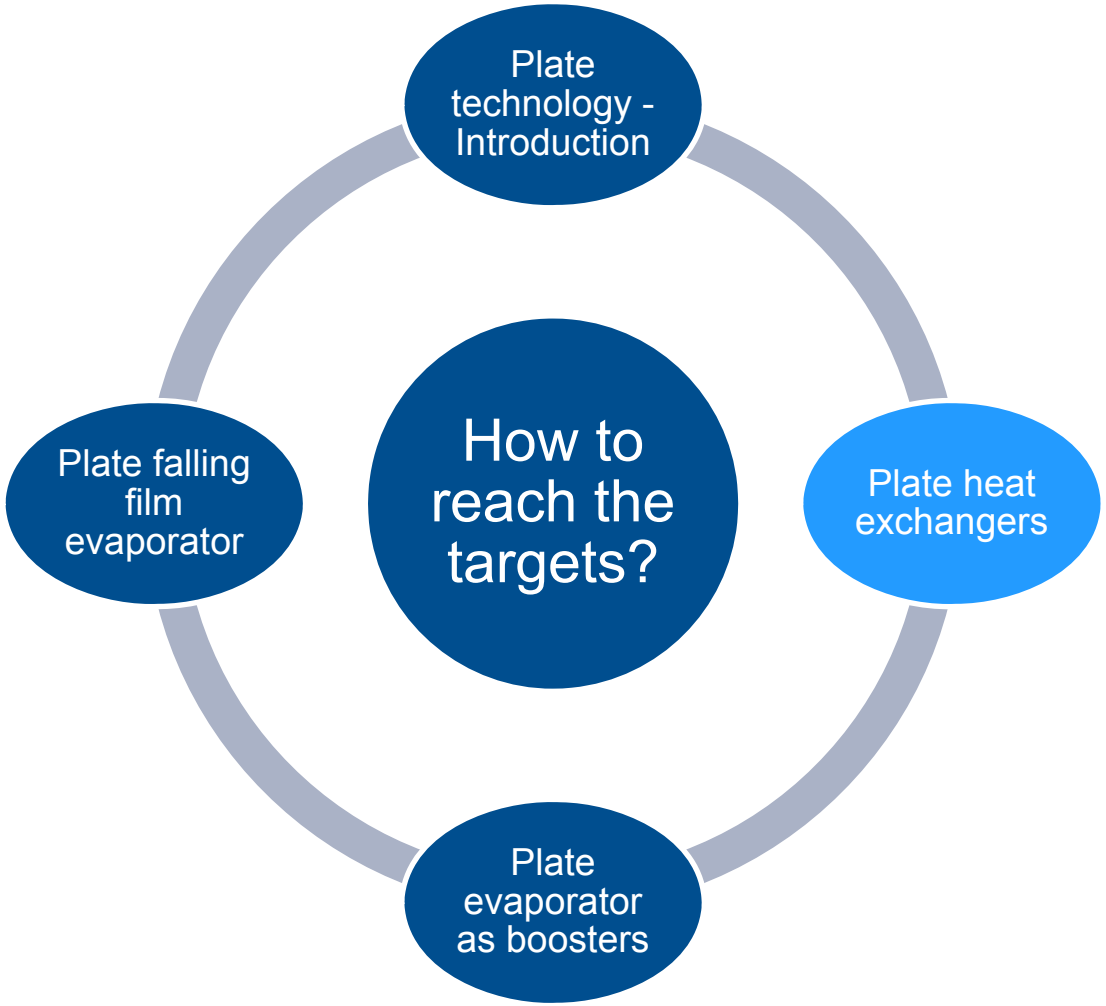
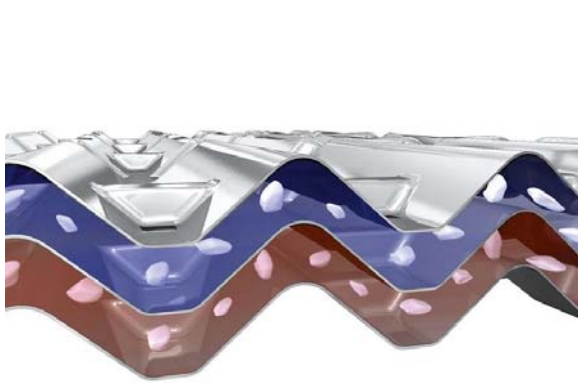
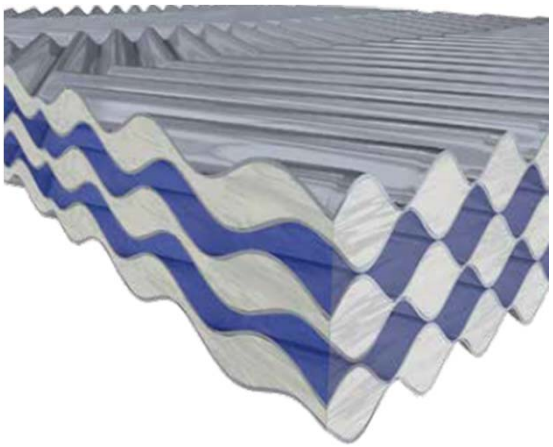

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Plate heat exchangers

Perfect type of plate for your certain application



Free flow plate



Wide gap plate

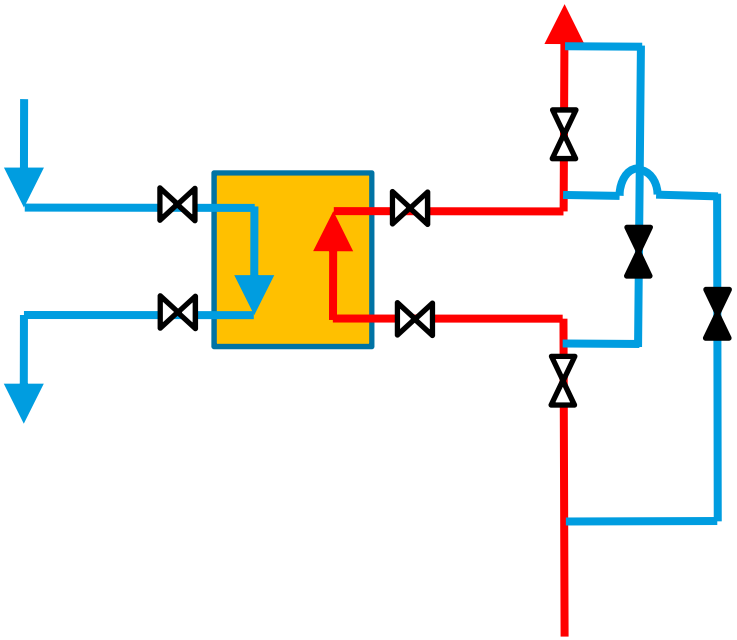


NT plate

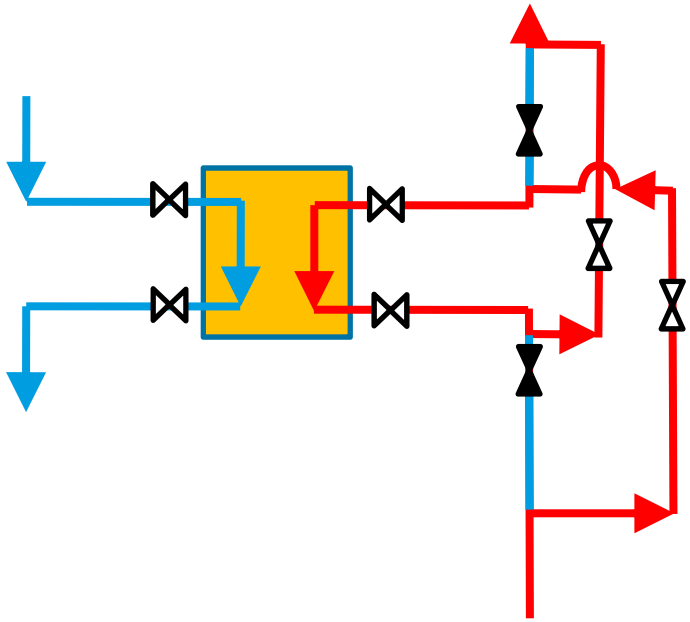
	Free flow	Wide gap	NT-series
Particles/fibers acceptable	Yes	Yes	No
Heating application	Mixed and raw juice	Clarified, clear juice	Clear, thin and thick juice

Plate heat exchangers

Back flush



1. Normal juice flow



2. Opposite to normal flow

- Supports thermal efficiency
- Reduces maintenance cost
- Prolonges durability

Plate heat exchangers

Advantages

- Tailor made for your requirements
- Superior thermal efficiency
- Easy to install
- Easy to clean
- Easy to adapt to changed conditions & flow rates





Plate heat exchangers

References:

- South Africa, TSB Komati
- Australia, Tableland
- China, diverse
- Egypt, Nile Sugar
- Germany, diverse
- Guatemala, Pantaleon
- Poland, Glinojeck
- Sweden, Nordic Sugar



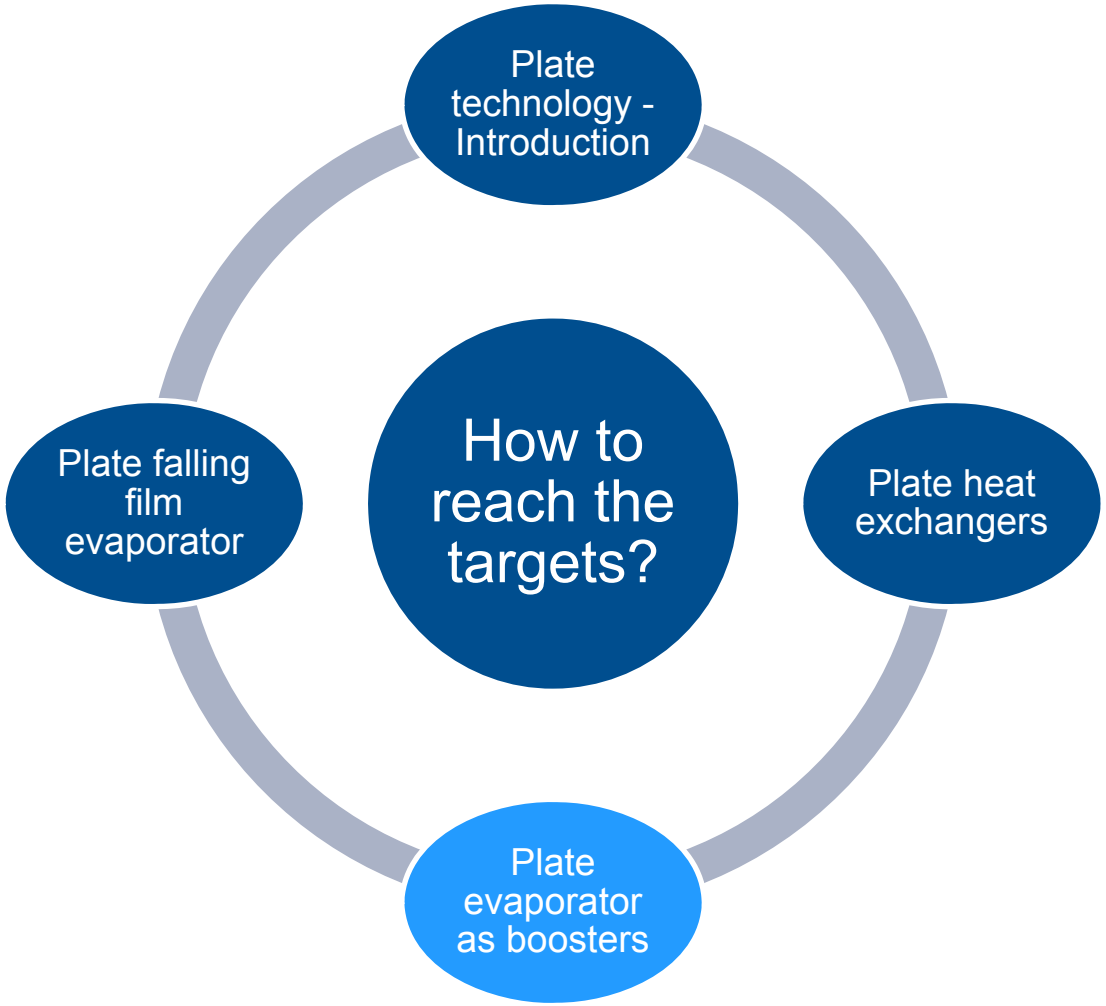

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Plate evaporator as booster

Rising film plate evaporator CONCITHERM CT193

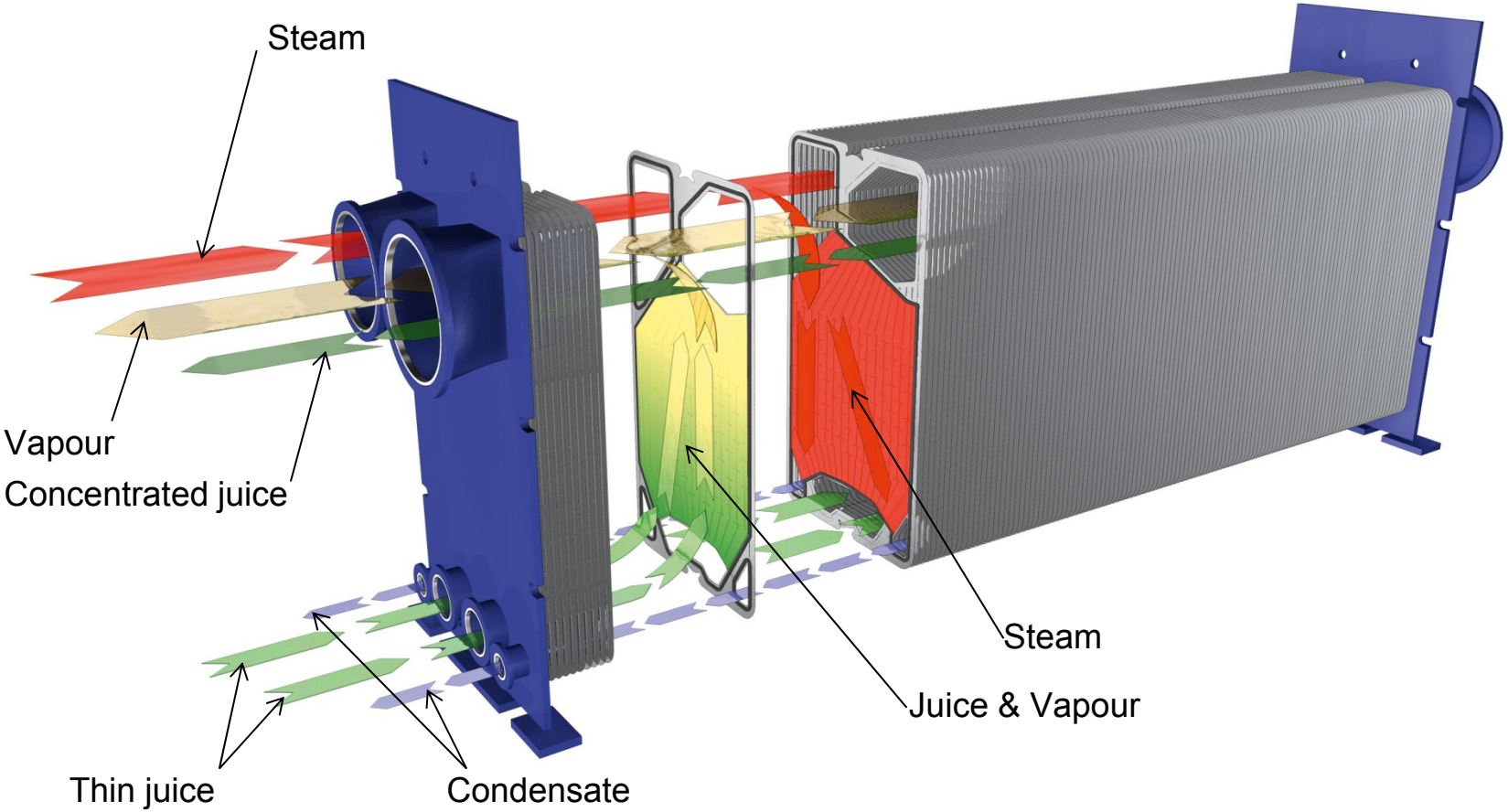


Plate evaporator as booster

Extension of existing Robert evaporation effect – current situation

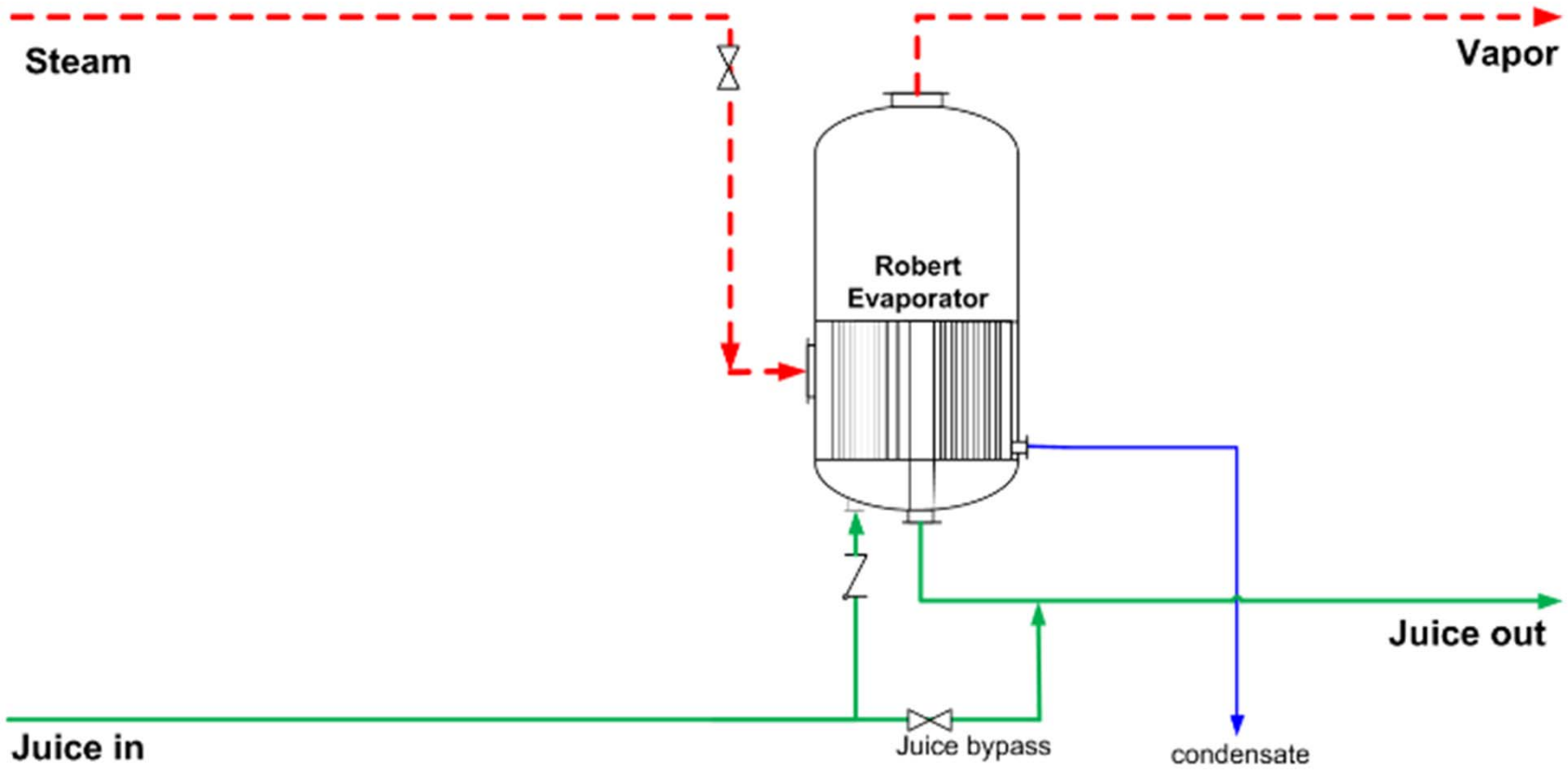


Plate evaporator as booster

Extension of existing Robert evaporation effect – additionial Concitherm CT193

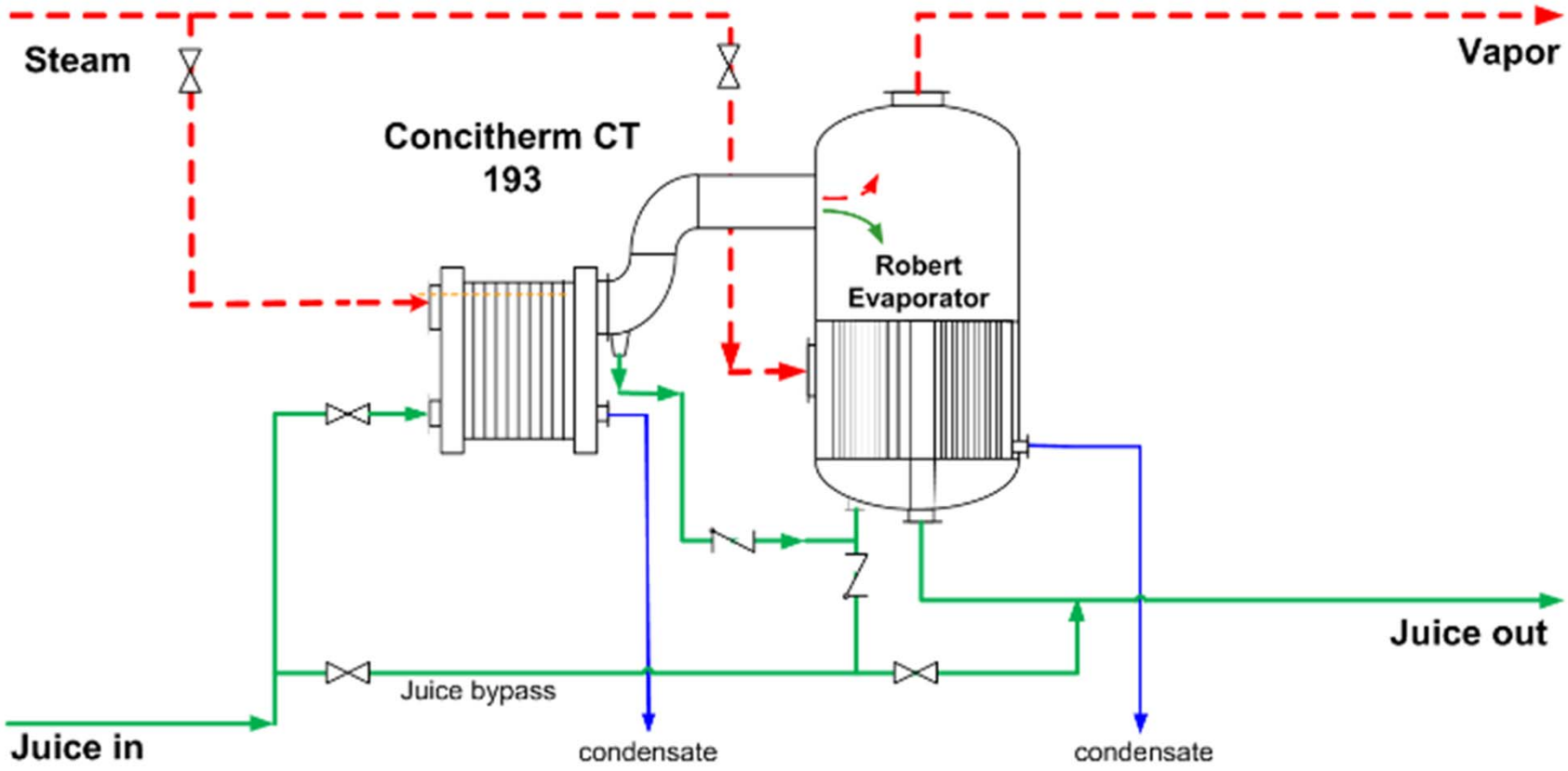


Plate evaporator

References:

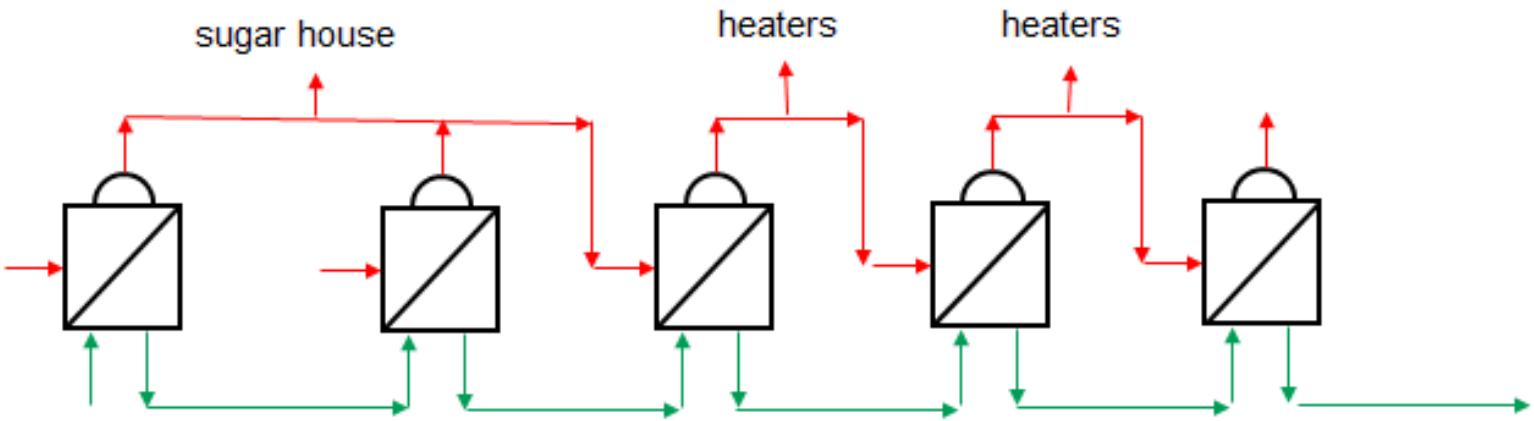
- **Mauritius, Medine**
- **Honduras, Santa Matilde**
- **Belgium, Orafti**
- **China, Congzuo Sugar**
- **Argentina, Ledesma**
- **India, Shree Renuka Sugar**
- **Vietnam, Khanh Hoa Sugar**





Plate evaporator

Design data from the Evaporation Station CT 193 - Khanh Hoa, Vietnam



effect	1 A	1 B (2)	3	4	5	
Juice m_E	185 t/h	142,8 t/h	103,6 t/h	58,8 t/h	39,0 t/h	28,7 t/h
Vapor m_V	42,2 t/h	39,2 t/h	44,8 t/h	19,8 t/h	10,3 t/h	
t_{steam}	120 °C	120 °C	112,2 °C	101,9 °C	90,1 °C	
t_{Vapor}	112,2°C	112,2°C	101,9°C	90,1°C	68,0°C	68,0 °C
Brix	11 %	14,3 %	19,7 %	34,6 %	51,1 %	69,3 %
CT 193	2 x1098 m²	2 x 1098 m²	2 x 1040 m²	2 x 525 m²	2 x 250 m²	

In operation for more than 15 years

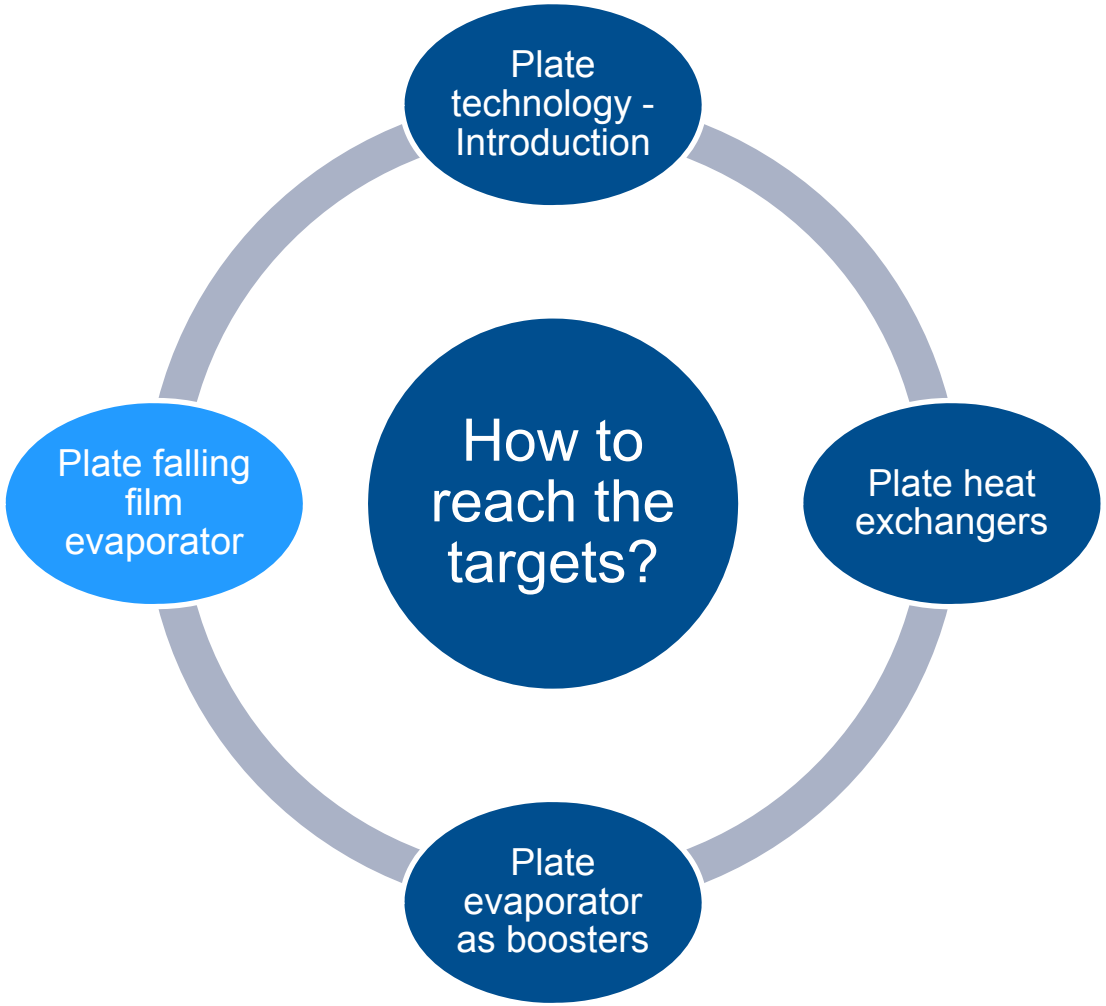

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Plate falling film evaporator EVAPplus

Main components of GEA Ecoflex plate evaporator EVAPplus

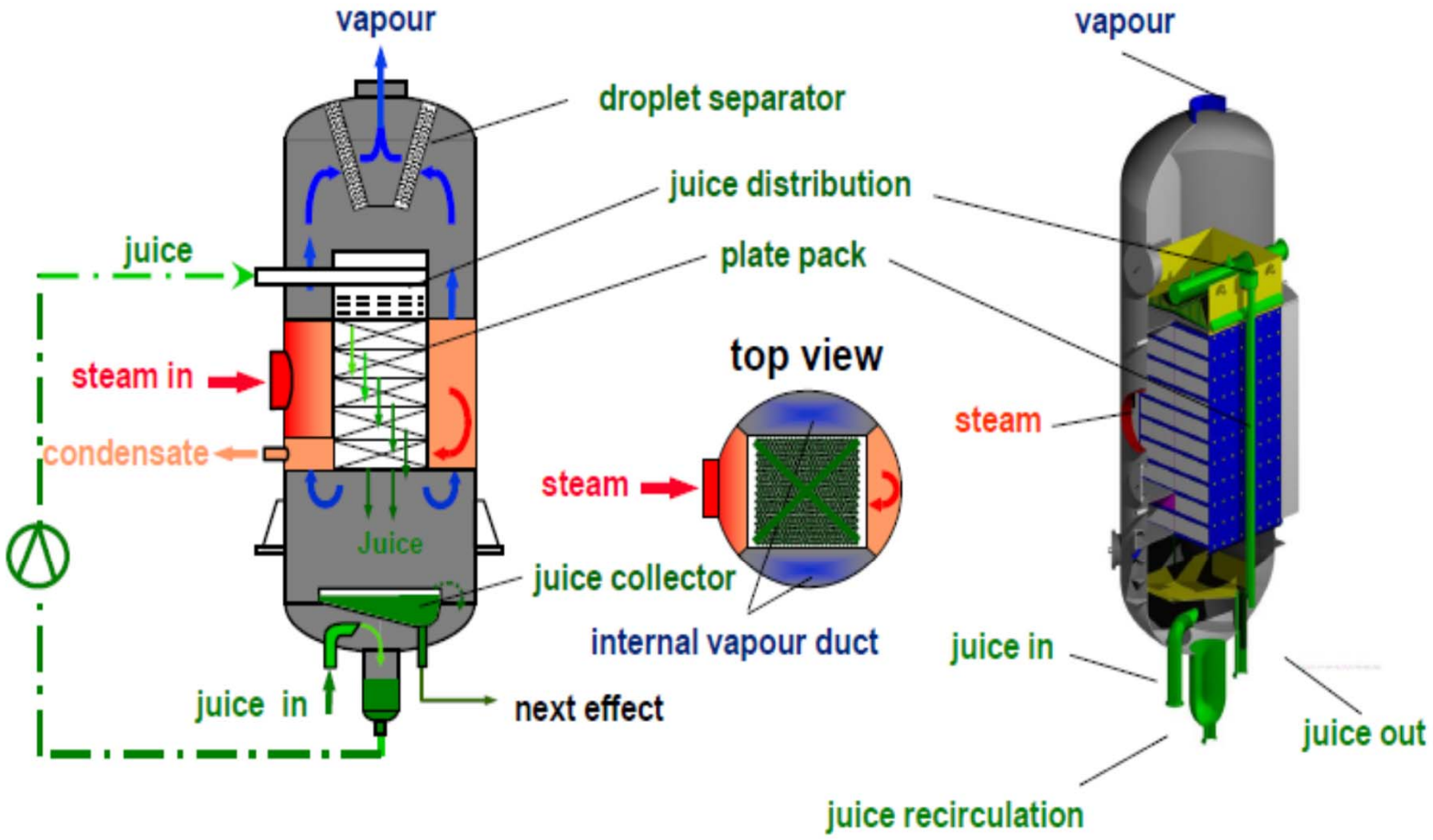


Plate falling film evaporator EVAPplus

Retrofit as solution for existing Robert evaporator

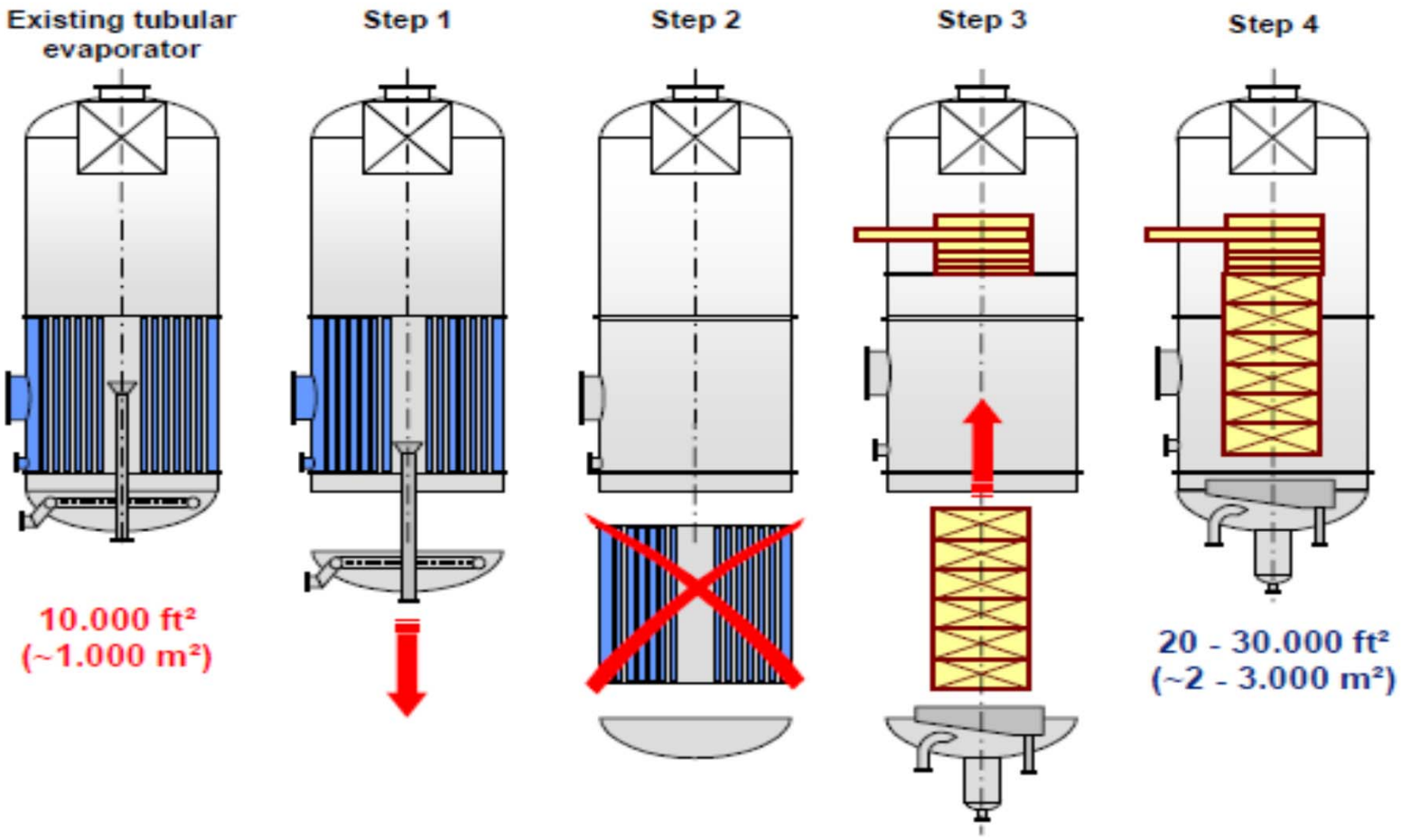


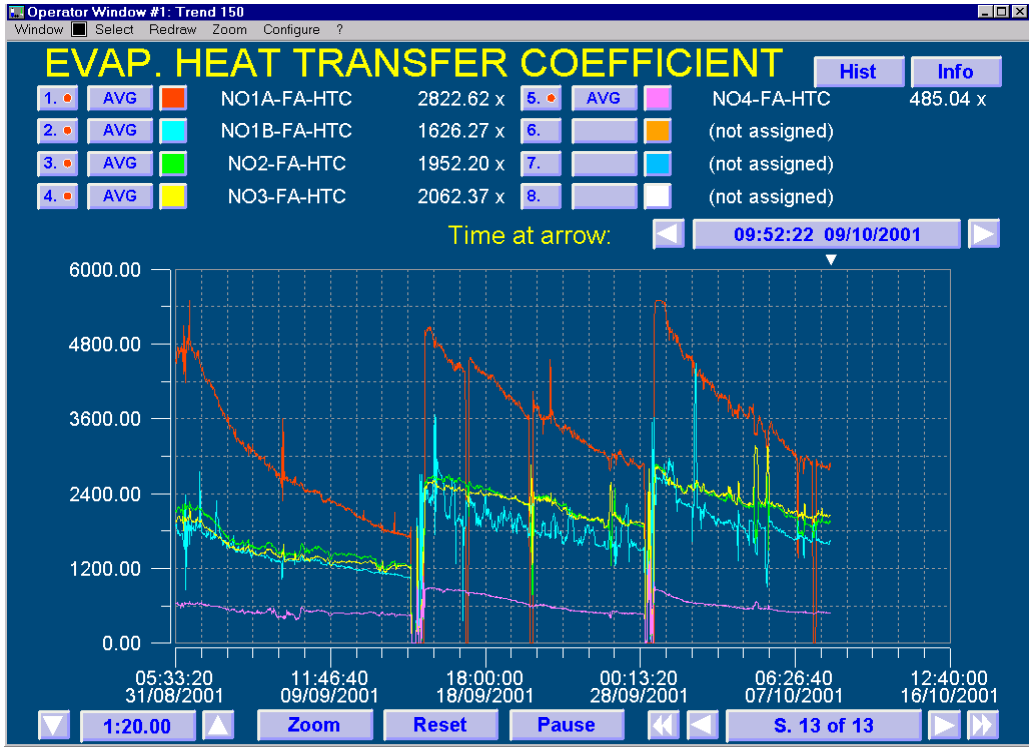
Plate falling film evaporator EVAPplus

References:

- Germany, Südzucker
- Netherlands, Suiker Unie
- Dubai, Al Khaleej
- Australia, Tableland
- Indonesia, Jatitujuh
- USA, Amalgamated Sugar
- Brasil, Zillo



Plate falling film evaporator EVAPplus





Tableland Sugar, in operation for more than 13 years

Summary

- **Plate technology helps to increase the capacity of your sugar mill**
- **Plate technology supports your competetiveness in the sugar market**
- **Plate heat exchanger and plate evaporator are key components for modern processes in the sugar industry.**







Thank you and have a sweet day!

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