KEY FIGURES DSEC

350+
Employees

300 M€
Latest project value

500+
Projects completed
in 65+ countries

09/2024

DE SMET
ENGINEERS & CONTRACTORS

SUGAR DIFFUSION

De Smet Diffuser, a sure value

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Sugar diffusion with De Smet Diffuser

De Smet Engineers & Contractors (DSEC) is a well-known **sugar diffusion expert**. DSEC is the owner of the De Smet Diffuser design that was developed as an application of the edible oil continuous counter-current extractor invented by Mr. Jean-Albert De Smet.

The **De Smet Diffuser** has been successfully used for **beet diffusion** and pre-scalding and remains one of the most efficient diffuser for **sugar extraction** in today's **cane industry**. Currently, the diffuser has by far the largest number of references.

The De Smet Diffuser has also proved to be capable of processing alternatively both **beet** and **cane** in areas where tropical beet can be cultivated in order to extend the plant operation after the cane campaign.

THE ADVANTAGES OF DIFFUSION

The advantages of diffusion over conventional milling have been confirmed by the performances in industrial operation.

De Smet diffusers have processed several million tons of cane in different countries and proved their:

- Simplicity
- Efficiency
- Low maintenance & operation costs
- Mechanical reliability
- Adaptability to changes in capacity.

TYPES OF DE SMET DIFFUSERS

De Smet supplies two types of diffusers:

- The **BAGASSE (TS) DIFFUSER** to process first mill bagasse,
- and the **CANE (TN) DIFFUSER**, to process shredded cane.

DSEC can therefore give you unbiased advice on the type of diffuser best suited to your conditions.

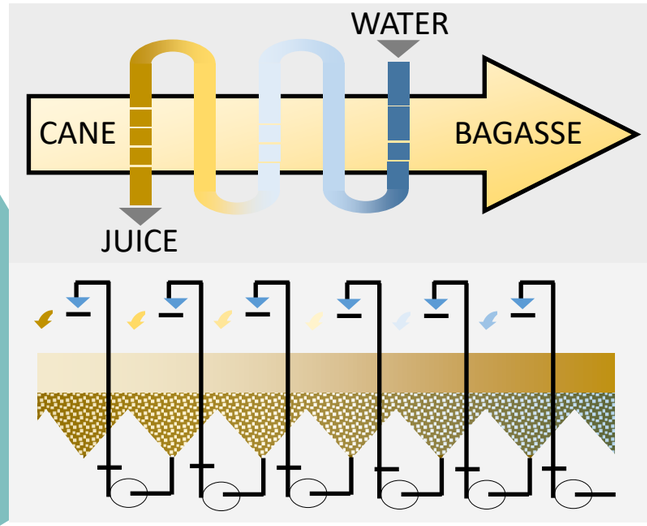
Both types of diffusers are mechanically similar and the TS type can be converted into a TN diffuser.

PRINCIPLES OF OPERATION

The operation of the diffuser is based on systematic counter current washing of the cane or bagasse by means of imbibition water.

In practice, this is achieved by forming a bed of shredded cane or first mill bagasse on a conveyor.

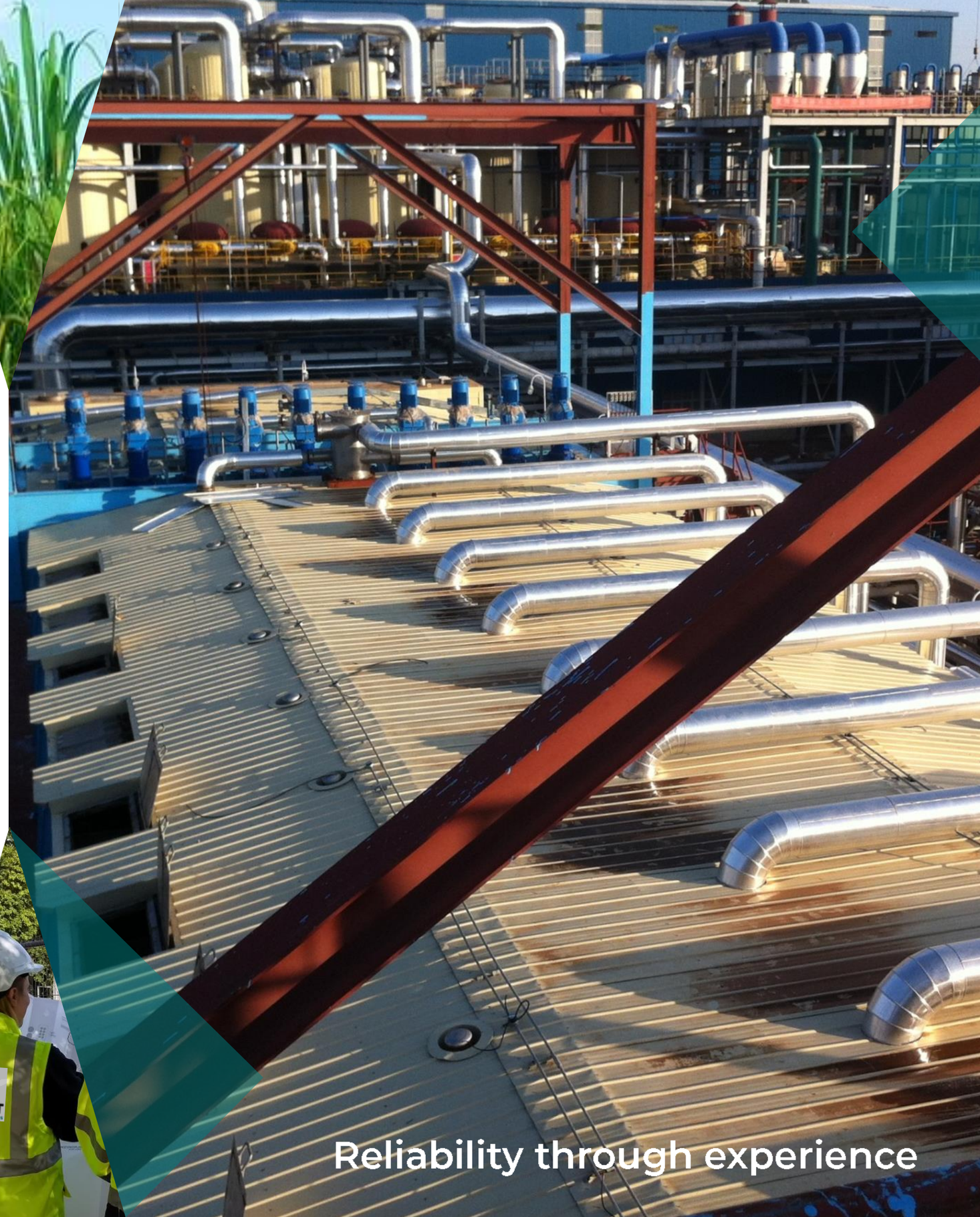
Water is added at the discharge end of the conveyor and percolates through the bed of bagasse and the perforated slats of the conveyor.



The water dissolves the sugar in the bagasse and the thin juice thus formed is collected in a hopper.

This juice is moved forward one stage by pumping and the process is repeated until the juice reaches maximum concentration at the feed end of the diffuser.

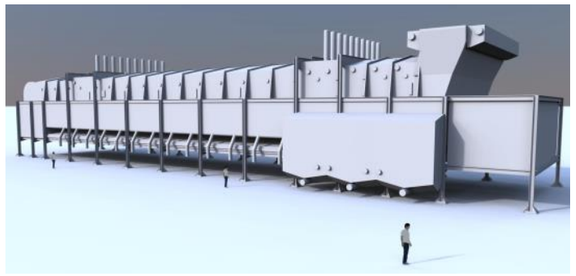
The diffuser may be conditioned either for single-flow or for parallel-flows juice circulation.



Advantages of the De Smet Cane diffusion process

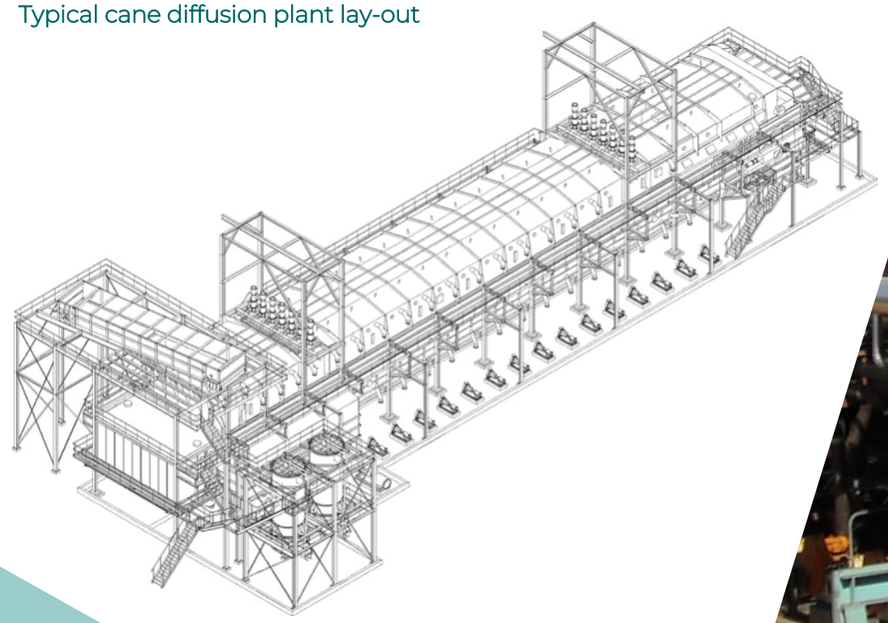
When compared to mills tandem, **sugar diffusion** with De Smet Diffuser presents many advantages amongst which:

- Better extraction yield (usually 1% higher than mills),
- Performances kept throughout the campaign (no mechanical wear and tear influencing the extraction yield),
- Improved juice quality with consequent reduction of losses at filtration stage,
- Slow motion equipment,
- Perfect counter-current operation,
- Reduced energy consumption,
- Reduced maintenance cost,
- Ease of operation and maintenance.



Except for some key components, the De Smet Diffuser is generally manufactured locally so that transport costs and import duties can be considerably reduced while providing activity to local workshops.

Typical cane diffusion plant lay-out



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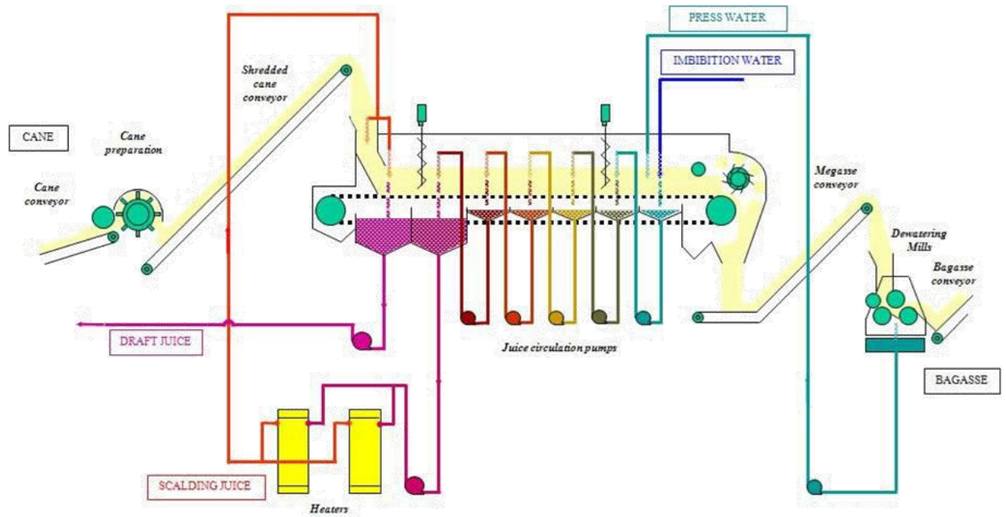
Diffuser description

The housing of the DE SMET diffuser is of welded steel construction.

Flow sheet of a De Smet Cane Diffusion Plant (TN):

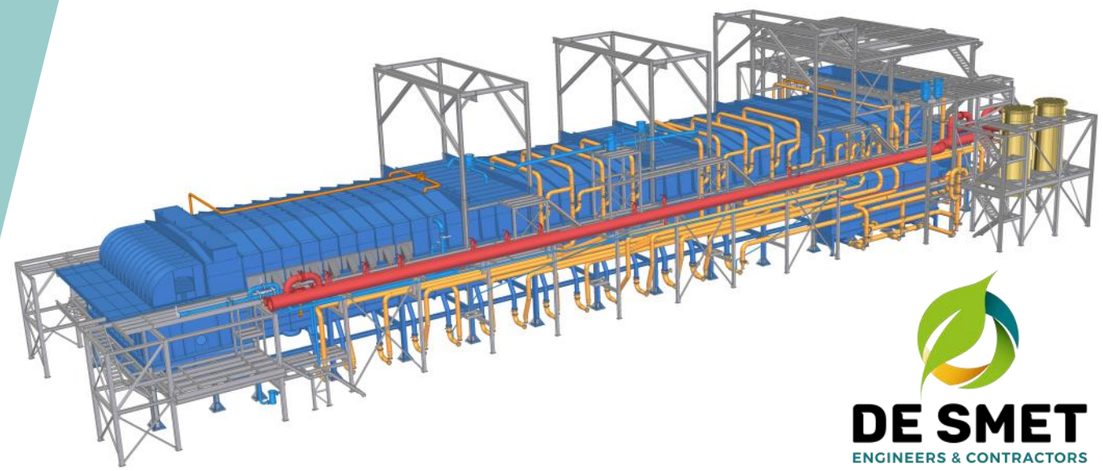


It is from 35 meters (110 ft) to 52 meters (170 ft) long; the cross section is rectangular and diffusers of different capacities are made in different widths.

The conveyor grids and screens are supported by two outboard type roller chains with a pitch of about 3 feet.

These chains are supported at the extreme ends by sprockets.

At the driven end, the sprockets are coupled through a gearwheel and pinion to a variable speed hydraulic drive or electric gearmotor drive.



The conveyor itself is made of articulated frames to which the screens are fixed.

The screens and frames are rigidly attached to corresponding links of the two chains.

These chains are fitted with self-lubricating bushings. The rollers ride on parallel rails. The return rails are completely exposed underneath the housing, giving full visibility and accessibility to the screens.

Some references

PROJECT	COUNTRY	CAPACITY	YEAR
Khon Kaen Sugar Industry PLC (KSL Group)	Thailand	20,000 MTCD	2018
KLIM Co.Ltd. for Ethiopian Sugar Corporation	Ethiopia	12,000 MTCD	2018
KLIM Co.Ltd. for Ethiopian Sugar Corporation	Ethiopia	12,000 MTCD	2017
Ethiopian Sugar Corporation	Ethiopia	2x 12,000 MTCD	2015
LAM SON Sugar JSC	Vietnam	8,400 MTCD	2012
Tendaho Sugar Factory	Ethiopia	13,000 MTCD	2014
ILLOVO SUGAR Sugar Factory diffuser, Nakambala	Zambia	8,400 MTCD	2009
ALMOIZ INDUSTRIES Limited	Pakistan	8,000 MTPD of cane 4,000 MTPD of beet	2007