

SMART DISTILLERY TECHNOLOGY

Enabling Ethanol Production From Multiple Sugar Factory Streams

In most tropical countries cane molasses, a by-product of sugar processing, is chiefly used as feedstock for alcohol production.

Over the past few years, global sugar prices have been under pressure, affecting the profitability of sugar mills. On the other hand ethanol is increasingly becoming a value adding co-product rather than a by-product of sugar mill making it important for sugar mills to balance sugar and ethanol production by using different sugar streams for ethanol production.

Most sugar mills in Brazil have been balancing cane sugar and ethanol production using cane juice streams in addition to molasses as feedstocks for ethanol.

However, the economics of cane & sugar prices in Brazil as well as the operating practices of distilleries are vastly different than those in other tropical countries. This dictates the economic viability of alternating sugar and ethanol.





SMART DISTILLERY TECHNOLOGY

“Smart Distillery” is a multi-feed, multi-product, ethanol complex that facilitates use of different sugar streams in addition/combination with B or C-molasses.

SMART DISTILLERY - MANAGING SUGAR-ETHANOL BALANCE SMARTLY ...

While evaluating different sugar streams as feedstock for alcohol production, PRAJ addressed the following factors in order to arrive at the most optimum option:

- Sugarcane crushing capacity.
- Distillery capacity in combination.
- Economics of diverting sugar streams to distillery for alcohol manufacture Management of feed-stocks, wastewater and energy in the distillery.
- Perishable or storable nature of the feedstock: Molasses & concentrated syrup (above 70 Brix) streams can be stored over several months whereas juice streams are perishable. It is important to use perishable streams on-line during crushing season and store molasses for off-season operation.

As a general rule sugar factory attached distilleries operate on C-molasses. They are usually designed with seasonal operations and would use about 12 to 14% of the sugar coming from cane via C-molasses.

Management of feed-stocks, wastewater and energy in the distillery.

PRAJ's “Smart Distillery Technology” is a unique solution, which comprehensively addresses the above factors and provides the answer to effectively manage feed-stocks, spent wash volumes and energy requirements in a sugar factory distillery complex.

While any of the streams can be used to produce alcohol, the model has to be optimized for commercial viability of sugar, ethanol and management of wastewater and energy.

The Smart distillery can also be designed for a larger capacity if more sugar from sugarcane is to be diverted for alcohol production.

SMART DISTILLERY BENEFITS :

- Smart Distillery integrates distillery operation with sugar processing. The options are based on length of cane crushing season.
- Can be operated with Secondary Juice or Filtrate Juice in addition to C or B molasses
- Option for sugar mills with half-year or shorter cane crushing season.
- Incorporates pretreatment section comprising of separation, clarification and partial evaporation.
- Partially evaporated juice sent on to the HIFERM continuous fermentation system for alcohol production.
- Water is recycled and reused, minimizing the fresh-water needs to almost zero levels.
- Wastewater/vinasse quantity is reduced to 1.5 to 2 liters.
- Overall energy integration reduces steam & electricity requirement of the complex by 2 to 4 %
- During the non-crushing season, the stored C-molasses is used as feedstock with special wastewater/vinasse minimization system resulting in generation of only 6 Liter spentwash / liter of spirit.
- In house press mud is sufficient to treat the entire annual wastewater volume generated resulting in zero discharge.
- Option for sugar mills with crushing season extending to 10 months.

SMART DISTILLERY The Praj Advantage

PRAJ undertakes design, engineering, construction and start-up services for Smart Distillery Technology based plants including :

- Audit of the Sugar Mill process
- Optimization of distillery capacity
- Optimization of the combinations of various feedstocks
- Integration engineering of Smart Distillery with sugar mill.

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