

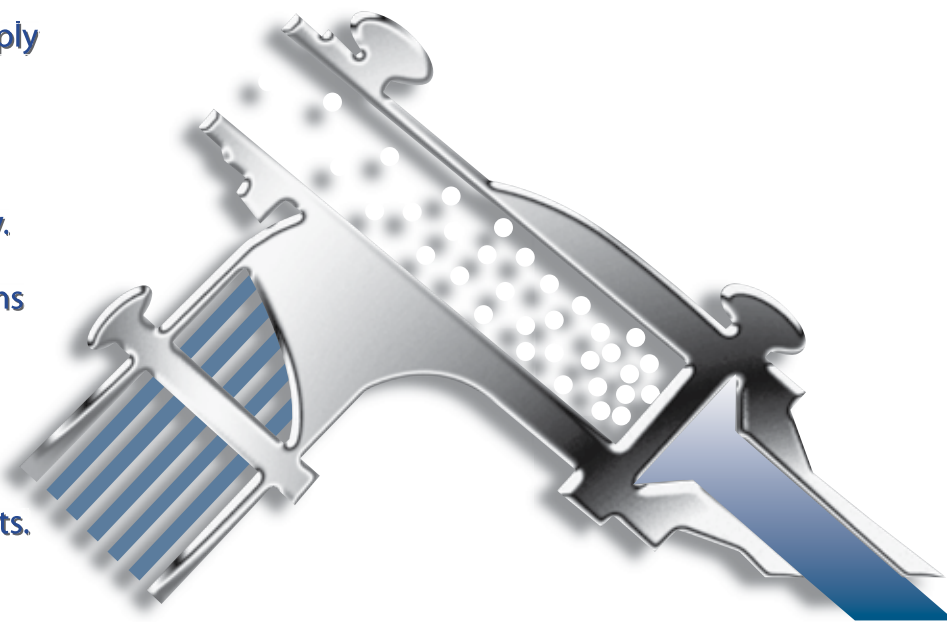
Total Solutions from

# Semi Bulk Systems, Inc.



## XSTREAM Sugar Liquefaction

- ▶ Reduce inbound syrup transportation costs by more than 32%.
- ▶ Significantly reduce raw material cost by buying granular sugar on the open market – better control your sugar supply problems and costs.
- ▶ Eliminate quality issues related to caramelization by lowering the process temperature & controlling water quality.
- ▶ Eliminate supplier and storage problems by moving syrup production in-house.
- ▶ Reduce maintenance with minimal mechanical process components.
- ▶ High Capacity to meet any requirements.
- ▶ Totally Automated Process Options to meet your process needs – Dynamic Continuous Steady State; Dynamic Batch; Continuous Batch Processes.
- ▶ Direct “On-Demand” to batch blend tanks - Eliminate syrup storage.



### PROCESS XSTREAM LINING<sup>SM</sup>

Semi-Bulk Systems is



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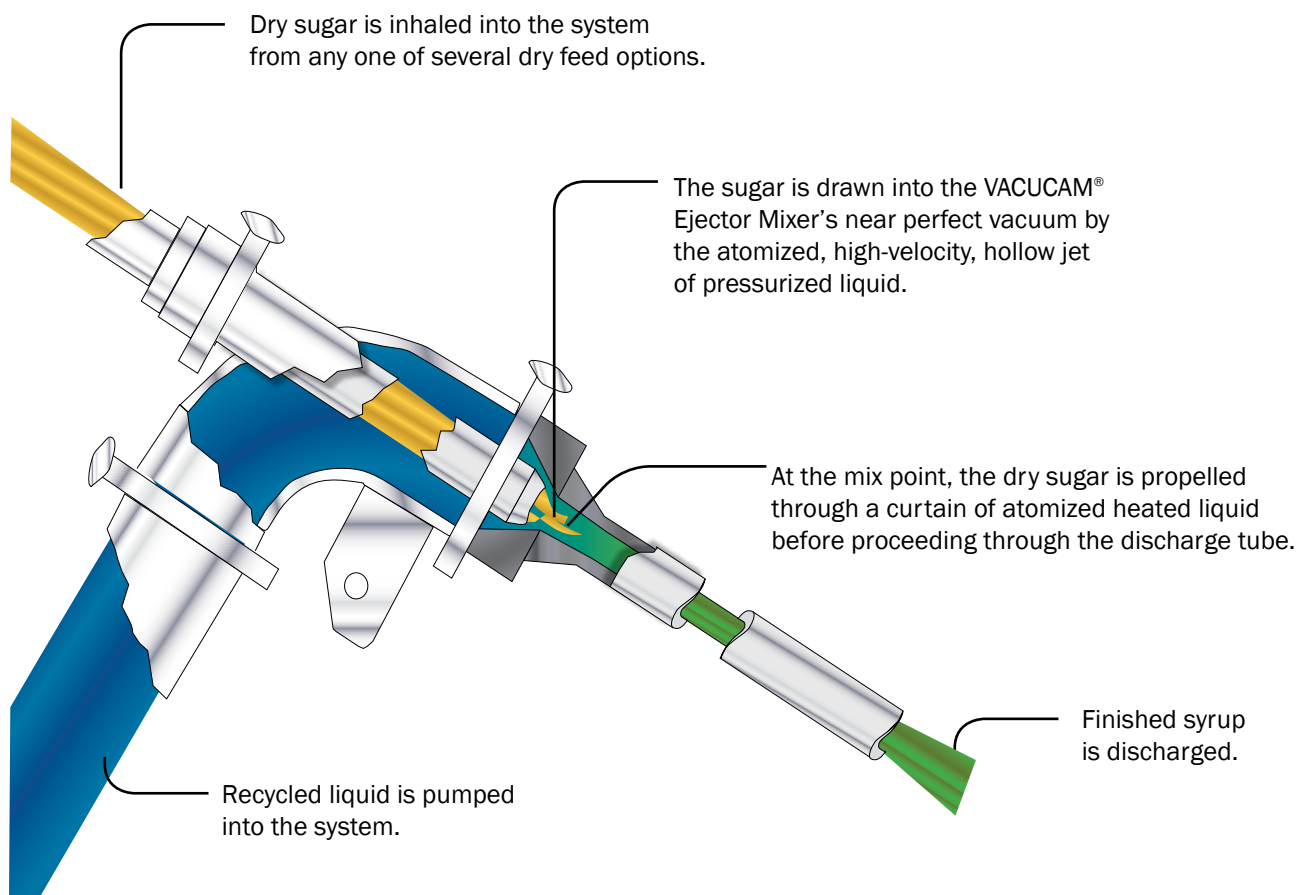
[www.semi-bulk.com](http://www.semi-bulk.com) (800) 732-8769

**Semi-Bulk Systems** offers modular sugar liquefaction processes to provide the most efficient process to meet your requirements **NOW** and for the **FUTURE**.

The **modular** schematic matrix of process options address SBS' capability to provide the complete turnkey process design. From the total dry side capability w/ bulk bags, w/ bulk truck or bulk rail unloading, silo storage, conveying and transfer to process area. The total expertise of dry side handling will provide all of the safety design considerations to meet new explosion design guidelines, humidity control in storage and bulk conveying of dry ingredients. Experience in bulk bag handling and rapid handling unload stations compliment our "total solution" for sugar handling and also offers options for additional utilization of the system for other bulk bag ingredients.

**The VACUCAM® Sugar Liquefaction system** works by forcing pressurized fluid through the Ejector Mixer's unique, patented annular nozzle. As the fluid passes through the nozzle it becomes finely atomized and creates a high-velocity, hollow jet—a near-perfect vacuum—into which the dry sugar is drawn. This action maximizes the reactive surface areas of both the dry sugar and the liquid before contact is actually made between the two substances. Once contact occurs, the result is high-speed, instantaneous, and complete wetting and dissolution of the sugar granule into syrup.

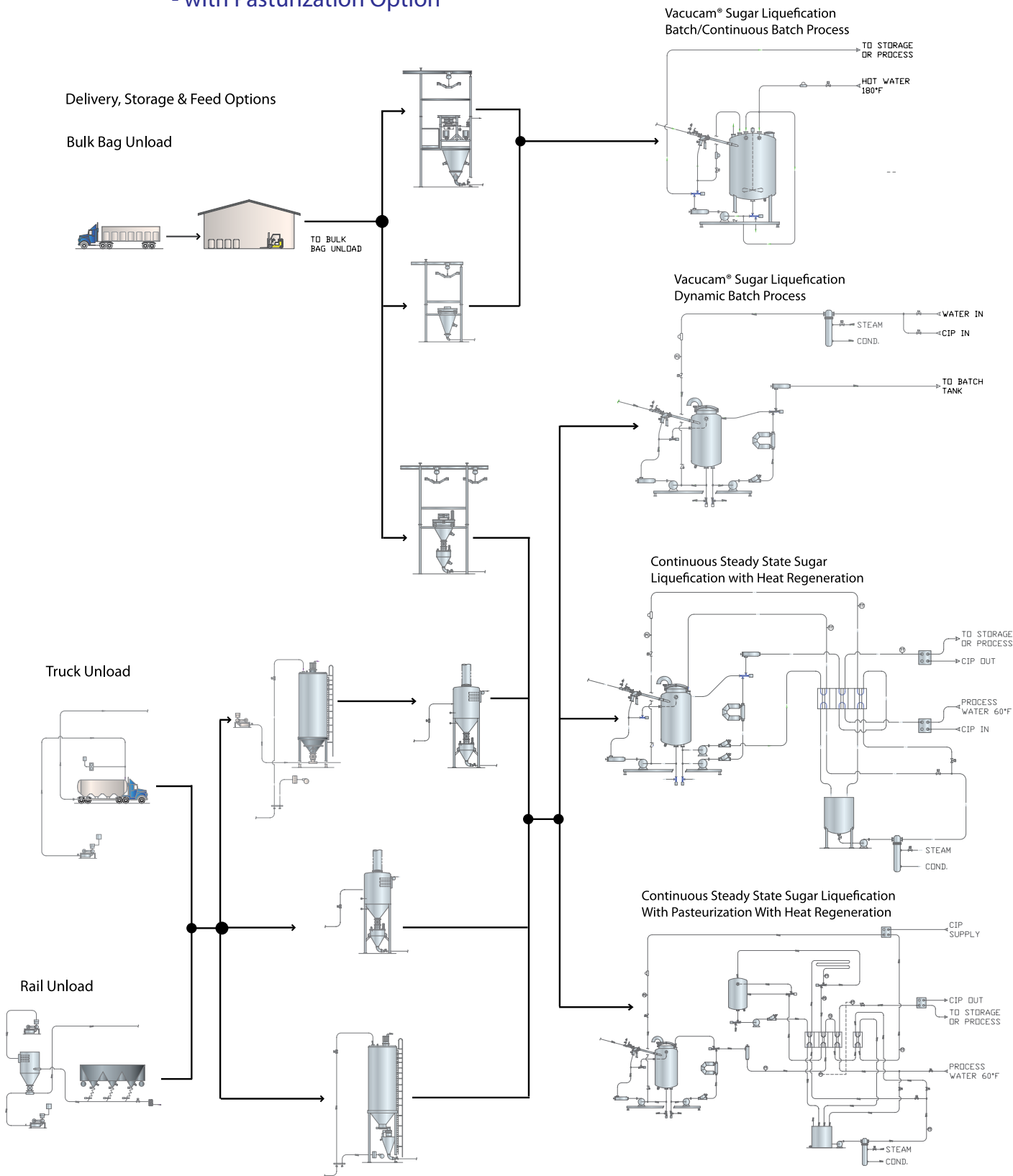
The Semi-Bulk Sugar Liquefaction Process system is available on a pre-packaged modular skid in three process options: Automated Continuous Steady State, Automated Continuous Batch, and Automated Dynamic Batch. You select the process based on your capacity and existing process needs and logistical requirements of your facility.



The Semi-Bulk Sugar Liquefaction Process System is available on a prepackaged **modular** skid in three process options: Automated Dynamic Continuous Steady State, Automated Continuous Batch, and Automated Dynamic Batch Process. SBS will help you select the process based on your capacity and existing process needs plus logistical requirements of your facility.

### SUGAR LIQUEFICATION PROCESSES:

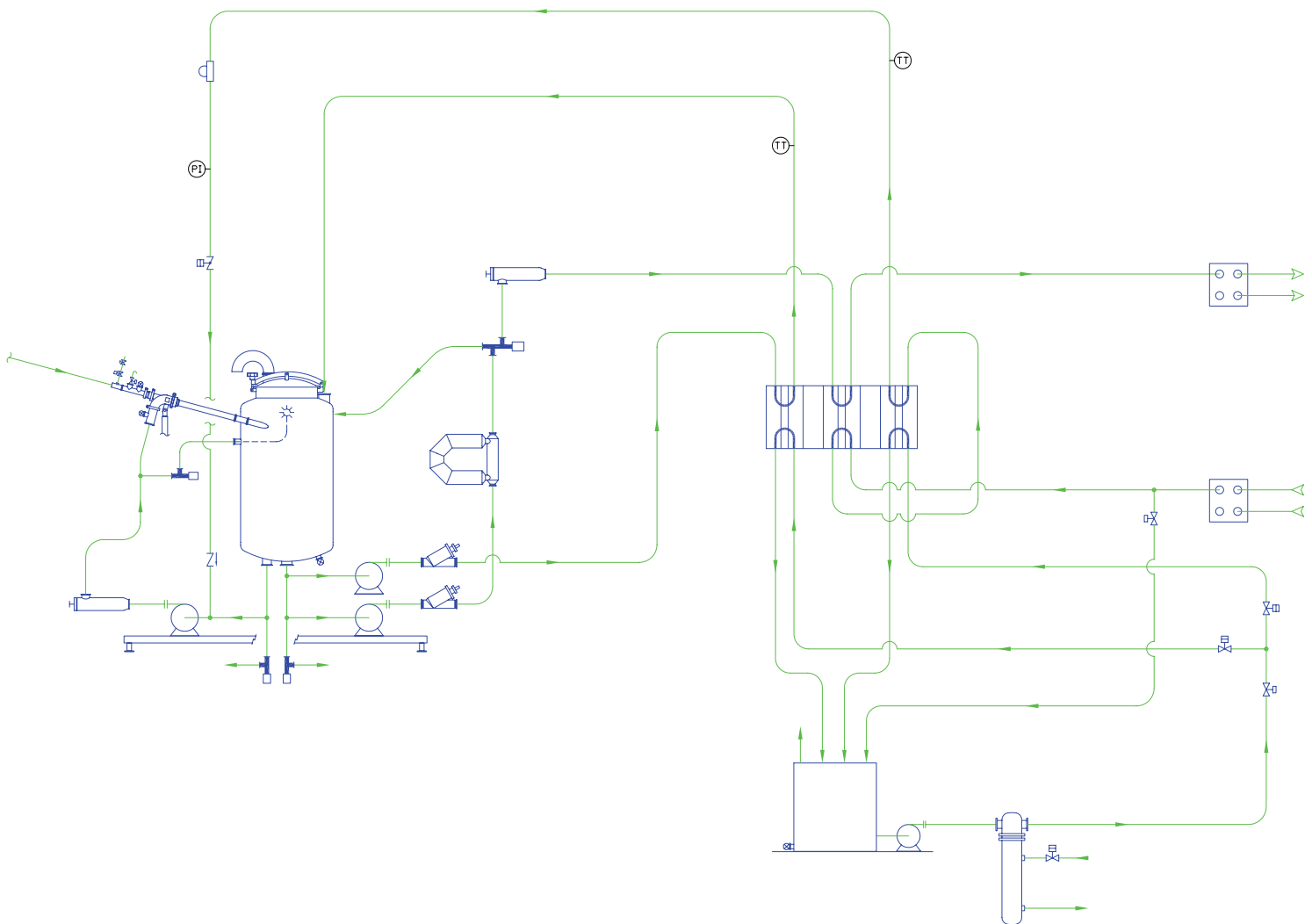
- Batch / Continuous Batch
- Dynamic Batch Station - DBS
- Dynamic Continuous Steady State w/Heat Regeneration - DCSS
- with Pasturization Option



## DYNAMIC CONTINUOUS STEADY STATE :

The Steady State Liquefaction Process is available in 7.6 MT/HR, 13.6 MT/HR and 18 MT/HR standard dry capacity units and is designed to receive and liquefy dry sugar to the desired set-point Brix value. These units are fully automated and make maintaining quality control easy. Dry sugar and liquid are mixed in the Ejector Mixer and feedback from the hot water proportioning valve, which responds to the liquid density meter, controls the addition of makeup water to maintain syrup concentration within specified control limits. The recirculation valve and Brix meter allow the tank to be circulated until the minimum set-level and Brix level set-point are reached and maintained. After the brix level is achieved in the mix tank, the transfer pump acts in response to the tank level set-point and will pump finished syrup to storage to maintain tank level set-point. The plate heat exchanger provides for heating of the incoming process water from heat regeneration of the finished syrup before pumped to storage.

### SCHEMATIC—SUGAR LIQUEFICATION-DYNAMIC CONTINUOUS STEADY STATE (DCSS)

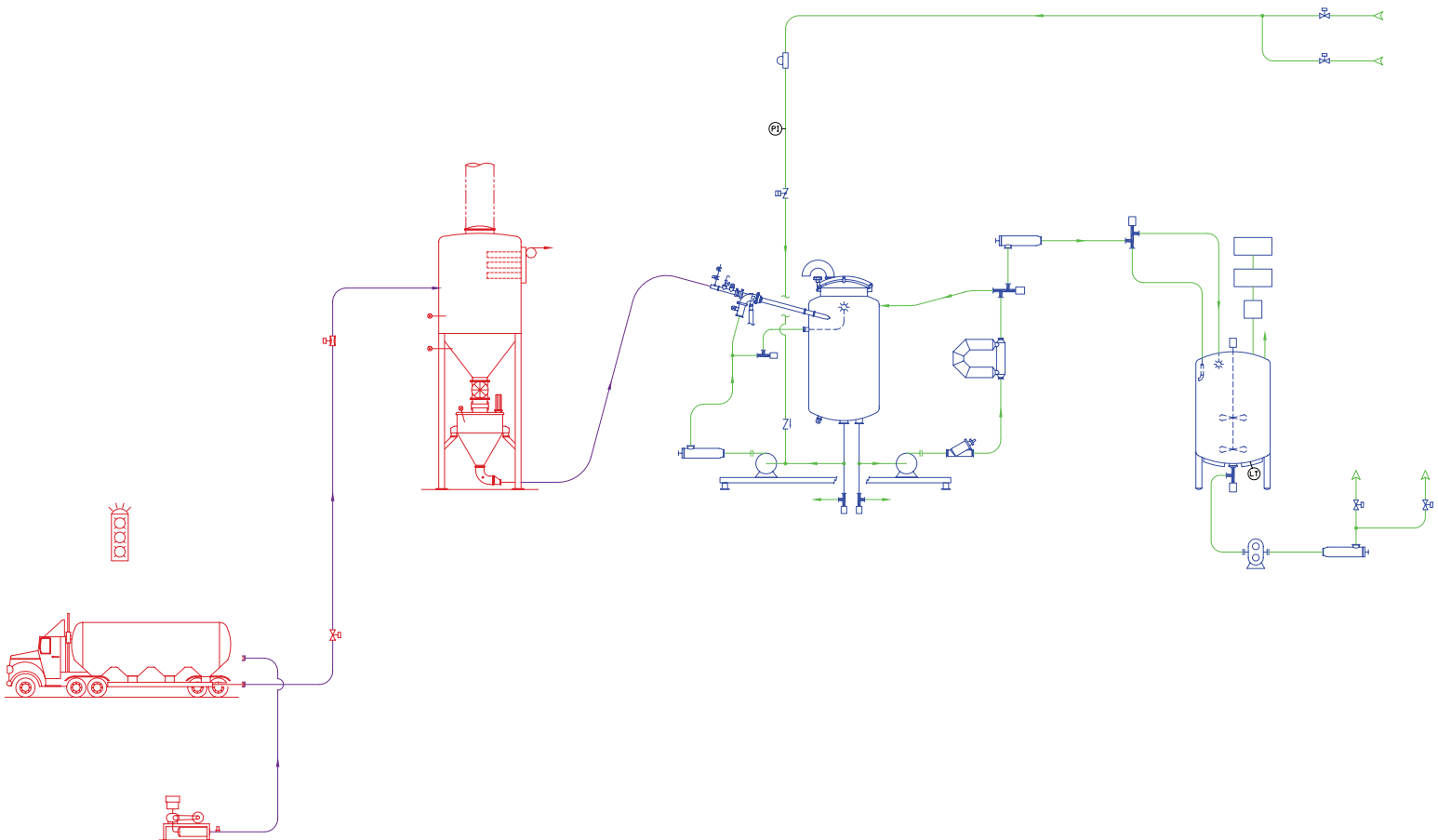


## DYNAMIC BATCH STATION (DBS):

The VACUCAM® Dynamic Batching Station Sugar Liquefaction Process receives and liquefies up to 18MT/Hr. [higher capacity systems available] of dry sugar to the desired brix level. The process is used for batch production directly from bulk truck. Also to produce “Batch on Demand” directly to batch blend tanks. This process can be fed directly from bulk bags or bulk silo. With “Batch on Demand” capability, syrup storage can be eliminated. The system is supplied with heated process water at a proportional rate to the sugar delivery.

The recycled liquid is pumped to the Ejector Mixer which is mounted on a modular Dynamic skid with de-aeration tank positioned beside the dry sugar feed option. One pump continuously circulates syrup and fresh water addition directly to the Ejector Mixer to convey and liquefy sugar. The second pump circulates the syrup through a density meter back to the tank until the syrup reaches the set-point brix level before the divert valve is switched to deliver finished syrup directly to a batch tank or directly to a batch blend tank for On Demand production. A proportioning water valve is controlled to provide a set-point control by the brix density meter.

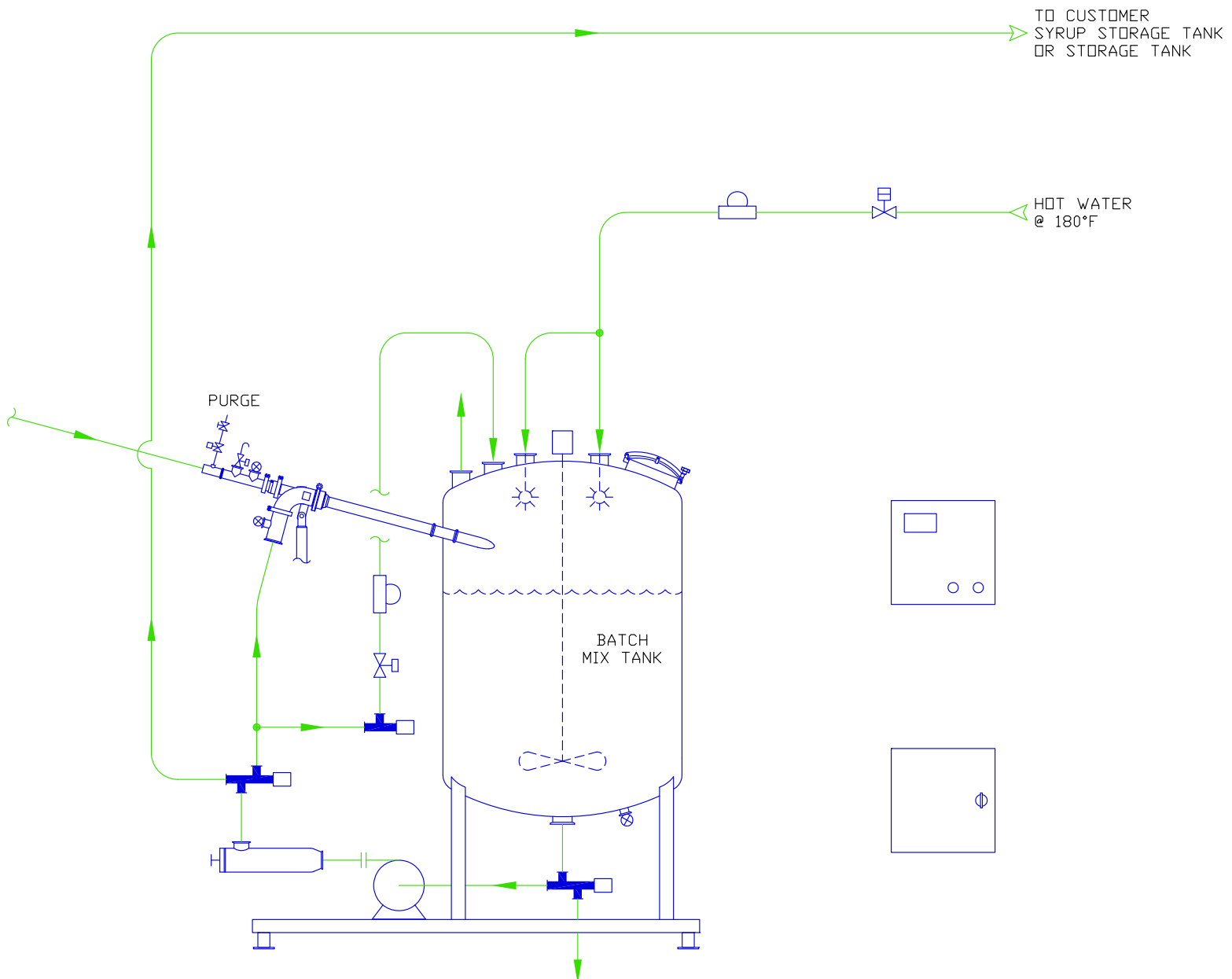
SCHEMATIC—VACUCAM® DYNAMIC BATCH  
Sugar Liquefaction System w/Bulk Truck Unload



## CONTINUOUS BATCH:

Designed to produce syrup in a self-contained unit and automatically deliver the finished batch to the process surge tank or syrup storage tank, the VACUCAM® Continuous Batch Recycle Sugar Liquefaction Process is available in two standard capacities: 7.5 MT/HR (67 Brix) or 10 MT/HR syrup. Like the In-Line Batch Process, this process can be fed from paper bags, bulk bags, bulk silo, or bulk trailer. Locate the unit next to the dry sugar supply and add hot water to the batch tank. As either fresh hot water or recycled liquid is fed into the Ejector Mixer, dry sugar is drawn into the vacuum in the Ejector Mixer and instantaneously dissolved. The syrup is then discharged into the batch tank where Brix level is monitored, stopping the powder feed when Brix level has been reached or when the sucrose batch weight set-point has been reached. The finished batch is then pumped into the surge or storage tank. When the transfer is complete, the systems PLC Controls automatically initiate the next batch process.

### SCHEMATIC—CONTINUOUS BATCH







## PROCESS XSTREAMLINING<sup>SM</sup>

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### CONTINUOUS STEADY STATE:

MIXER	MODEL 150B/C	MODEL 250C	MODEL 340C
SUGAR (DRY)	280#/MIN 7.6 MT/HR	500#/MIN 13.6 MT/HR	670#/MIN 18 MT/HR
SYRUP (67 BRIX)	11.3 MT/HR	20.3 MT/HR	27 MT/HR SYRUP (CONTINUOUS)

### DYNAMIC BATCH:

MIXER	100EJM 2000	150B/C	250C
SUGAR (DRY)	150#/MIN 4 MT/HR	280#/MIN 7.6 MT/HR	500#/MIN 13.6 MT/HR
SYRUP (67 BRIX)	6 MT/HR	11.3 MT/HR	20.3 MT/HR

### CONTINUOUS BATCH:

MIXER	150B/C	250C
SUGAR (DRY)	280#/MIN 7.6 MT/HR	500#/MIN 13.6 MT/HR
<b>BATCH SIZE</b>	500 GAL/BATCH	1000 GAL/BATCH
(FINISHED SYRUP)	1900 LT/BATCH 2.5 MT/BATCH	3800 LT/BATCH 5.0 MT/BATCH
<b>BATCH MIX TIME</b>	13 MINUTES	22 MINUTES
<b>TOTAL BATCH CYCLE TIME</b>	APPROX. 20 MIN.	APPROX. 30 MIN.
<b>BATCHES/HR</b>	3	2
<b>SYRUP CAPACITY</b>	7.5 MT/HR	10 MT/HR

**\*\* Higher Capacity Options Available - Please Contact Us at 800-732-8769 for Options.**



**VACUCAM® DBBS 250 - See application options for Sugar Liquefaction Processes.**

Dimensions: 189.96 cm L x 121.92 cm W x 233.68 cm H

**BENEFITS:**

- Multi-functional Design allows for Maximum Utilization. Efficiently handles and rapidly disperses ALL dry and liquid ingredients.
- Capacity- Maximum incorporation Rates for high capacity mixing and batch making. One Mix station can feed 2-4 bottling lines.
- Isolates Dry Ingredients representing allergic or other cross-contamination issues.
- Efficient use of process and C.I.P. Water
- Low / No maintenance - pump is only moving part
- Automation – reduced batch time and labor.
- Very Low Energy Usage - typically 80% reduction in electricity by eliminating large hp shear mixers and greatly reducing mix time. Eliminate need for heated water in mixing NFDM, other milk powders, gums, pectin and other functionalizing ingredients.
- Improved Operator Safety & GMP – Floor level operation – eliminate operator platforms.



# TOTAL Solutions for Liquefaction of Raw Sugar

In addition to its standard modular processes described herein, Semi-Bulk Systems offers Total Solutions to address worldwide changing requirements for the supply of raw sugar. It's modular skidded processes are expanded to include the capability to deliver low color syrup for the food and beverage industry.

- Receiving of raw sugar with high speed unloading and transfer to storage
  - 50kg bags, 50kg reusable bags, 1 ton bulk bags, and bulk trucks
- Silo Storage with transfer to silos and delivery to selected Liquefaction process line
- Continuous Steady State Sugar Liquefaction Processes with required heat sets and heat regeneration systems
- Flotation process w/ filtration w/ dewatering of filtrate for solids disposal
- Activated Carbon addition for decolor and deodor process with process for handling bulk bag/paper bag of activated carbon with surge hopper with automated addition of activated carbon on continuous steady state basis through a Vacuam® Ejector Mixer for maximum ergonomics, environmental, automation and process efficiencies
- Filtration process filters using D.E. filter media in pressure filter units
  - Including process for handling bulk bag/paper bag of D.E. with surge hopper; with automated make-up of D.E. slurry to support pre-coat tanks. D.E. slurry produced in total dust controlled process through a Vacuam® Ejector Mixer for maximum ergonomics, environmental, automation and process efficiencies
- Polishing Filters
- Regeneration heat exchange system
- Sterilization / pasteurization processes
- Deliver to Syrup Storage

***Contact Semi-Bulk Systems to discuss the Total Solution to allow your company to source less expensive sugar in the world market.***

# **XSTREAM** Sugar Liquefaction

**GET  
XSTREAM  
RESULTS!!!**

***Call us Today or go to  
[www.semi-bulk.com](http://www.semi-bulk.com)  
to learn more.***

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