Crystallization System

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Introduction

We have found that a "System approach" is often more appropriate to allow a smooth start-up, especially when plant personnel are already quite busy with the existing equipment at the beginning of the campaign. One may also consider the fact that the System we offer is the product of experiences from different plants, but tailored to each installation.

We must emphasize the fact that a good control of cooling water temperature and flow will lead to a better optimization of the crystallization system. This will lead, in turn, to a shorter pay-back

System description**

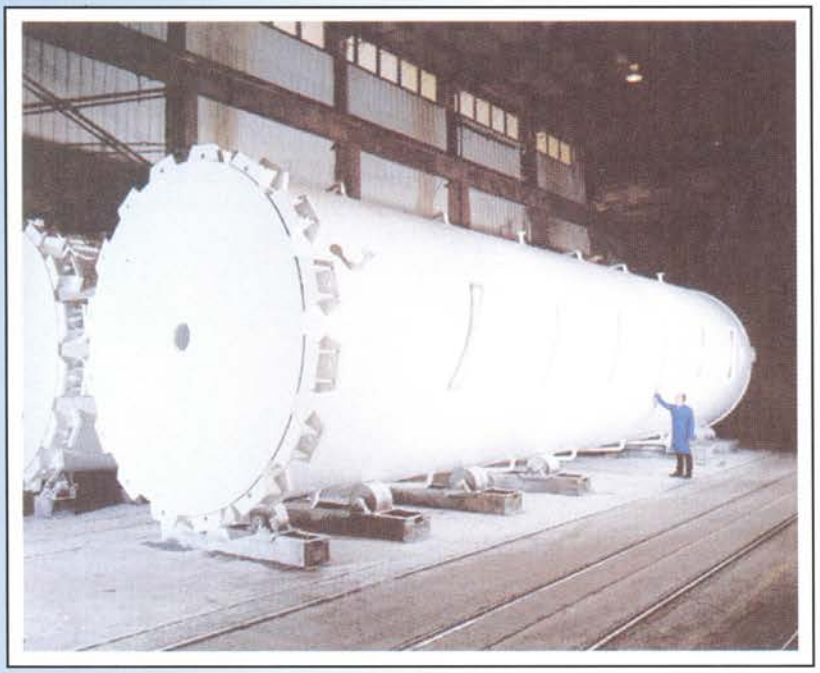
A System could include part or all of the following:

- One (or more) crystallizer(s)
  The crystallizer is designed to improve control of the cooling curve by having two separate cooling sections. Adjusting cooling water pathways by simple hand valves will easily accelerate the cooling in the first part of the Crystallizer, allowing the massecuite to remain at a cooler temperature for a longer time. The plant should be able to further optimize crystallization by adjusting water flow rates and cooling water temperatures. One can also go back to a more linear cooling curve by turning some simple hand valves. Other cooling approaches can be considered upon request.
- One (or more) reheater(s)
  The reheater is designed to quickly increase the massecuite temperature without introducing crystal melting. A special header design fights channeling at its source.
- One cooling/heating skid
  The cooling/heating skid and the control panel enable careful monitoring and control of the massecuite tightness to further improve molasses exhaustion.
- The corresponding control panel.

**Each particular feature is described in the individual brochures.

SILVER WEIBULL

Massecuite Vertical Crystallizer



Crystallizer ready for transport

General Construction

A Silver Weibull crystallizer is basically a vertical tank with an upwards or downwards flow of massecuite. The inside is equipped with alternating cooling serpentines and a slowly rotating agitator shaft. All models come complete with cooling water inlet and outlet, and an enhanced mixing and wiping system. This unit is designed to be shipped in one piece but can easily be shipped in sections as needed.

- High height-to-diameter ratio. Promotes plug flow for best heat transfer and a uniform crystal growth distribution.
- Linear cooling curve and improved cooling curve are available.
- Stirring arms wipe (scrape) all upper and lower surface of the stationary cooling elements in contact with the massecuite. All cooling surfaces are wiped every two minutes.
- Cooling serpentines layout is designed to strongly reduce thermal stresses typical of tube-through-shell design.
- The tall design provides head for the massecuite to flow to following vessels, particularly to the reheater, but also to the centrifugal station.
- The stationary cooling surfaces are equipped with flanges for field connection.

Standard Models Available

MODEL	VOLUME		STANDARD HEAT EXCHANGE AREA**		DIAMETER		HEIGHT	
	m3	ft3	m2	ft2	m	ft in	m	ft in
SW6000LP	170	6000	251	2700	4.20	13'9"	12.8	41'11"
SW7000LP	198	7000	307	3300	4.20	13'9"	15.2	49'10"
SW8000LP	227	8000	362	3900	4.20	13'9"	17.6	57' 9"
SW9000LP	255	9000	418	4500	4.20	13'9"	20.0	65' 8"
SW10000LP	283	10000	474	5100	4.20	13'9"	22.4	73' 7"
SW11500LP	326	11500	530	5700	4.20	13'9"	24.8	81' 6"

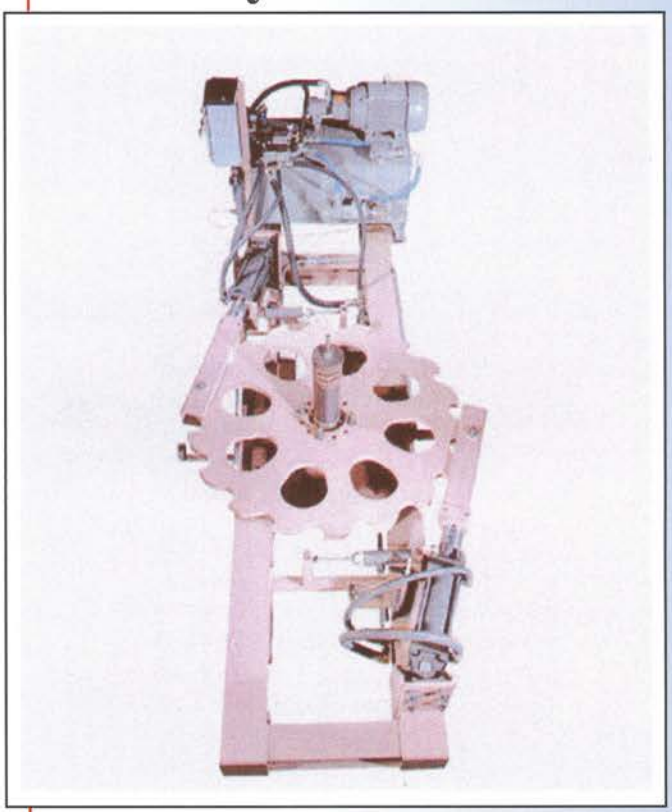
** Higher heat exchange area density available upon request

Drive Construction

Our standard drive is a positive twin cylinder hydraulic drive system. Hydraulic motors or geared motors are also available upon request. Because the drive system is located at the top of the crystallizer, there are *no troublesome rotary joints.*

- At the top of the crystallizer, an 18-tooth ratchet wheel is fitted to the agitator shaft. This ratchet is pushed by hydraulic cylinders, anchored to the crystallizer frame. During normal operation, each cylinder alternatively pushes the ratchet wheel 20 degrees.
  In case of failure of one of the cylinders in the system, it is possible to rotate the shaft at half normal speed with minor adjustments.
- The drive has a high torque rating for the heaviest massecuites: 230,000 NM nominal (170,000 ft.lb) up to 305,000 NM (225,000 ft.lb). All parts are robust in design. The drive system requires a minimum of maintenance.
- The hydraulic power unit is located directly on the drive bridge. All hydraulic connections are made and tested at the plant.
- Drive bridge assembly is fully tested at the plant.

Twin Cylinder Drive



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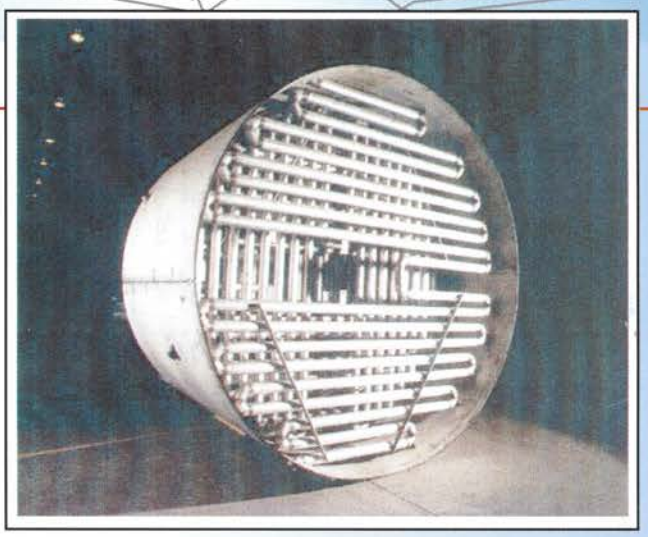
Access

Access to the crystallizer drive has to be permanent. The recommended way to provide access is to build a platform extending the top of the upper shell around the drive power unit. This platform is generally connected by the plant personnel to the nearest available building floor.

The crystallizer is supplied with a series of manholes along its side. Because they do not need to be accessed during the campaign, a simple ladder is sufficient to provide access.

Material

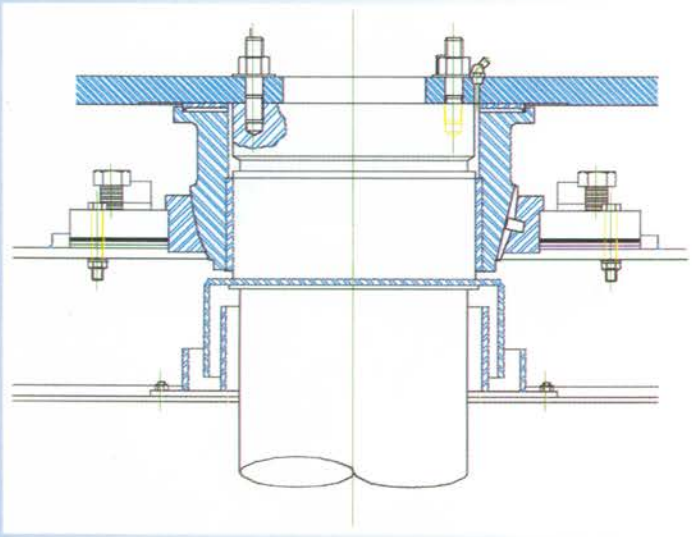
Standard crystallizers are made of mild steel.



High Density Cooling Surface

Options

- Hydraulic motor or Gear reducer for shaft rotation.
- Air cooling for the hydraulic power unit.
- Stainless steel construction for every part in contact with massecuite.
- Possible increase of heat exchange area with tighter serpentines and/or jacketed shell.
- Top platform and side ladder.
- Basic control panel with a PLC managing rotation and basic alarms.



Upper Swivel Bearing
All models come with a self-aligning shaft bearing system.

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