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Personnel responsible:

1. Lead Operator, Material Handler

Safety:

Safety shoes and safety glasses are required when working in, on, or around the crystallizers.

Summary:

To start a crystallizer, it is emptied of any water, filled from the bottom, and slowly brought to operating condition for production.

Procedure:

A. Fill the Crystallizer


1. Drain the elbow with the elbow drain and close it.
2. Note: Condensation can form in elbow and make it look like the seal is bad – only verify seal if the crystallizer is completely empty
3. Open the bottom valve on the crystallizer to ensure it has been drained.
4. Connect a hose from the Brine Storage Tank discharge valve to the Liquid Load Pump.
5. Connect the outlet of the Liquid Load Pump to the bottom of the crystallizer.
6. Open the Brine Storage Tank discharge valve and start the Liquid Load Pump.
7. Begin filling the crystallizer with brine.
8. Adjust the density with the water valve on the Brine Storage Tank so that you fill the crystallizer with 1.33 – 1.35 density material.
9. When the level goes above the elbow, (about 120 inches) start the elbow pump (Elbow speeds are posted on the elbow pump drives)
10. When the liquid reaches 165 inches, close the bottom valve.
11. Stop the Liquid Load Pump and close the Brine Storage Tank discharge and water valves.
12. Uncouple the hoses and clean up.

B. Start the Crystallizer


1. Ensure the small condenser pump is running.
2. Start the large condenser water pump and the mass flow pump.
3. Start the vacuum pump.
4. Ensure the steam is on the steam jet.
5. Put the vacuum set point on 0.85" Hg.
6. The temperature will begin to drop. When it gets to 30 deg C., (temperature reading from mass flow meter and/or production screen) crystals will appear in the sight glass.
7. The crystallizer is now ready for start up.

C. Using the Heat Exchanger

1. Ensure Crystallizer discharge is connected.
2. Set the set point on the discharge control to 14 gpm.
3. At the heat exchanger, connect crystallizer discharge to exchanger feed (open feed valve).

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4. Close the exchanger sample and drain valves.
5. Open the valve to the Mother Liquor Tank.
6. Open Crystallizer discharge valve (and close Crystallizer Solids Sample valve) and let flow stabilize.
7. At exchanger, verify flow by opening the exchanger's sample valve.
8. Ensure the condensate valve is fully open.
9. Open steam valve completely.
10. Watch the controller screen and feel the pipe to ensure discharge is heating up.
11. When the density in the Crystallizer reaches 1.39, close the discharge valve and wash through the system.
12. Go to the exchanger, close the valve to the Mother Liquor tank, and open the valve to the Brine Feed Tank (middle valve).
13. Close the wash water and open the discharge valve
14. Add about 4 gpm of Mother Liquor and add or reduce brine as needed to maintain level.
15. Continue running until crystals are large enough to dry well.
16. When ready for dryer, divert the discharge to the mother liquor pot.
17. Turn on the wash valve to the heat exchanger.
18. Close the steam valve.
19. Wait about 2 minutes to ensure water has washed the line to the Brine Feed Tank.
20. Open sample valves and close wash valve.
21. Let the exchanger and lines drain through the sample valves.
22. Close valve to Brine Feed Tank
23. Swap hose to Centrifuge.

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TRAINING DOCUMENTATION

	EMPLOYEE	TITLE	SIGNATURE	DATE
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REVISION HISTORY

Revision Number	Revision Date	Revision Author	Revision Description
00	12/5/2005	PLO	Original Procedure
01	12/7/2007	N/A	Unknown – Undocumented Changes
02	9/30/2008	PLO	Updated for using brine to fill crystallizer
03	1/15/2009	PLO	Added note about condensation in elbow appearing as seal problem (section A step 2)
04	7/8/2009	PLO	Incorporated heat exchanger procedure into filling and starting for greater clarity
05	7/19/2010	PLO	Returned to filling up with 1.33 – 1.35 density material instead of brine. Eliminated speed references