

GILES CHEMICAL CORPORATION		
COMPANY PROCEDURE		
Standard Operating Procedure	Page : 1 of 4	Revision : 12/15/2005 Date : 11/10/2005
Author: Patrick Owen	Title: (00)Crystallizer Shutdown	

Manuf-Crys-02

Personnel responsible:

1. Lead Operator, Material Handler

Safety:

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

Summary:

A crystallizer may need to be shut down for whatever reason. The shutdown may be for a few hours or a few days, but the procedure is the same. If the proper procedure is not followed, the crystallizer will be either too warm or too cold and the solids will be high or low.

A. Shut Down of a Crystallizer:

1. At the centrifuge, open the sample valve and close the feed valve.
2. Close the Crystallizer discharge valve.
3. Stop the discharge pump and wash out the line with water.
4. Close the brine tank valve.
5. Connect a water hose the brine pump valve and wash the brine feed line into the crystallizer.
6. Close the crystallizer brine feed valve and open the sample valve.
7. Stop the brine feed pump.
8. Close the mother liquor pump valve and uncouple the mother liquor feed pump hose.
9. Wash the mother liquor line through to the crystallizer.
10. Stop the mother liquor feed pump.
11. Shut the mother liquor feed valve off, and open the sample valve.
12. Stop the vacuum pump and turn off steam to the eductor.
13. Shut the steam off of the fine salt loop heat exchanger.
14. Close the fine salt loop discharge valve.
15. Open the washout on the fine salt loop.
16. Open the drain valve temporarily to ensure water is flowing through the loop.
17. Close the fine salt return valve.
18. Close the washout valve.
19. Stop the fine salt loop pump.
20. Keep watch on the level, temperature, and density.
21. Make proper intervention if necessary

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B. Restart from temporary shutdown (assuming centrifuge and dryers are ready)

1. At the centrifuge, close the solids sample valve and open the feed valve.
2. Start vacuum pump, turn on steam to eductor, and allow crystallizer to cool to 30 deg. C.
3. Start discharge pump to resume flow to centrifuge.
4. Begin feed of brine by opening the manual valve to get 15 gpm, and then starting the brine feed pump.
5. Close the mother liquor sample valve.
6. Connect the mother liquor hose, open the pump valve, and start the pump.
7. Open the mother liquor feed valve and adjust flow with the pump valve.
8. Start the Fine Salt Loop (see procedure for Fine Salt Loop)
9. Resume normal operation

C. Dumping a Crystallizer

1. Use as much from the crystallizer as you can.
2. With the crystallizer shut down, connect a steam hose to the bottom valve and steam until the temperature reaches 40 degrees C.
3. Connect a hose from the bottom valve to the Small Press Pump.
4. Connect the outlet of the Small Press Pump to the Mother Liquor or Peco Tank.
5. Open the bottom valve and start the Small Press Pump.
6. Adjust the density with dilution water to 1.32 – 1.34.
7. Empty the crystallizer.
8. Close the bottom valve.
9. Close the Mother Liquor or Peco Valve and stop the Small Press Pump.
10. Uncouple the hoses and clean up.

TRAINING DOCUMENTATION

	EMPLOYEE	TITLE	SIGNATURE	DATE
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REVISION HISTORY

<u>Revision Date</u>	<u>Revision Number</u>	<u>Revision Description</u>
11/28/05	00	New Document
12/15/05	01	Updates from Operator training