

ASHBROOK KLAMPRESS®



9.0 DAILY OPERATION PROCEDURES:

9.1 General: These procedures cover the routine operation of the Klampress® and should be used as a model for a plant's customized procedures.

9.2 Pre-Operation: This covers the steps which should be followed prior to starting any of the belt press functions. These steps help ensure the safety of the operators as well as the equipment.

9.2.1 Pre-Start Inspection:

- (a) Verify no foreign objects are on the belt or in an area that will interfere with the belt press operation.
- (b) Ensure chicanes are positioned on belt.
- (c) Verify tensioning control valve is in the tension position and that the belt is ready for tensioning.
- (d) Ensure all feed pumps are ready for operation and all valves are open.
- (e) Ensure the scraper blades are in position against the belts.
- (f) Verify panel and machine have not been locked-out due to a prior alarm or maintenance condition.
- (g) Inspect hydraulic power unit and verify the oil level is adequate for operation.

9.2.2 Start-Up: The sequence detailed is for a completely manual start up. Depending on the installation, the electrical controls may have the capacity to completely automate the start up. However, it is important to know the manual start up process to evaluate the effectiveness of the control system.

- (a) Start belt wash system.
- (b) Start hydraulic system and allow two minutes for belts to completely tension.
- (c) Start belt drive system and allow the belts to be completely pre wetted prior to adding sludge.
- (d) Start sludge and polymer feed pumps.

9.3 Operation: The routine practice of inspecting the belt press during the operation phase will minimize down time. The inspection instructions are divided into mechanical and process checklists for the aid of the operators and mechanics.

9.3.1 Mechanical Inspection:

- (a) Ensure feed assembly is evenly loading the belt.
- (b) Ensure chicanes are turning sludge mass and inspect them for wear. Replace chicanes as required.
- (c) Ensure edge restrainer seals are contacting the belt and seals are not worn. Replace or adjust seals as required.
- (d) Ensure doctor blades are functioning correctly. Inspect blades for wear and replace as required.
- (e) Inspect gravity drainage grids for wear. Replace wiper bars before belt contacts metal support grids.
- (f) Ensure belt wash system is completely cleaning belt. Look for streaking or striping on the belt. If present, rotate the wash water hand wheel fully counter clockwise and then fully clockwise to clean the spray nozzles.
- (g) Inspect wash box seals for wear. Replace as required.
- (h) Inspect dewatering belts for wear. Repair holes per maintenance instructions. Repair or replace broken belt seam wires.
- (i) Ensure steering sensing paddles are in contact with the belts and correcting belt steering as required.
- (j) Ensure there are no leaks from any of the systems.
- (k) Inspect roller coatings for wear and ensure flingers are in place.
- (l) Ensure all electrical controls are functional.

9.3.2 Process Inspection:

- (a) Adjust sludge feed rate for process throughput requirements.
- (b) Adjust polymer feed rate until flocculation is correct.
- (c) Adjust belt speed and tension for above conditions.
- (d) Ensure mixing energy is in the correct range.
- (e) Adjust belt tension and nip roller pressure if available as required for optimum dewatering.

9.4 Normal Shut Down & Clean Up: The key to minimal down time and reduced maintenance costs is housekeeping. If the belt press is inspected and maintained daily it can be counted on for years of service. The following guideline should be used for daily machine shut down and cleaning:

- 9.4.1 Shut down the sludge and polymer feed systems.
- 9.4.2 Allow the belt wash station to run for 45 minutes without any sludge or polymer feeding onto the belt press. During this time period:

- (a) Lift the chicanes off the belt.
- (b) Wash down the Klampress[®] from top to bottom using a water hose.
- (c) Rotate the scraper blades away from the belt and hose down the scraper assembly, especially behind and under the blades.
- (d) Wash out the drain pans.
- (e) When the machine is completely washed down and free from sludge, return the chicanes and scrapers to their operating position. Clean the wash water spray tube by rotating the wash water hand wheel completely in the counter clockwise direction and then completely in the clockwise direction.

9.4.3 Shut down the belt wash water system.

9.4.4 Shut down the drive unit.

9.4.5 Move the tension control valve on Klampress[®] to the retract position. Allow the belt to completely retract to clean and oil the cylinder rods.

9.4.6 Shut down the hydraulic power unit.

9.4.7 Move the tension valve to the tension position.

9.5 Emergency Shut Down: The machine could be stopped without going through the normal shut down sequence due to a mechanical failure or other emergency. While the machine will not be damaged due to this type of shutdown, the life of components could be shortened by not cleaning the belt press. If the machine is shut down because of an emergency, the following steps should be taken:

9.5.1 Identify the problem and estimate the down time.

9.5.2 If the machine will be down for more than one shift then:

- (a) Wash the machine down to prevent sludge from drying on both belts. The area where both belts are in contact with the sludge (pressure section) should be given extra effort.
- (b) If possible, relax the belt tension.
- (c) Correct the emergency condition.
- (d) Start hydraulic power unit and reduce belt tension to 25 pli by adjusting the pressure control valve on the hydraulic power unit.
- (e) Place the tension valve in the tension position and allow the belt to tension.

CAUTION: Starting the belt drive at full tension with cake between the belts places unnecessary stress on the belts, belt drive motor, and rollers. This could lead to premature mechanical failure.

- (f) Start wash water and allow belt to pre-wet.
- (g) Start belt drive. If belt is not clean, allow the machine to run for 45 minutes to complete a belt wash down cycle.
- (h) Increase the belt tension to the normal setting.
- (i) Start the sludge and polymer feed systems and begin operation of the press.

9.5.3 If possible, relax the belts by placing the control valve in the retract position.

9.5.4 Correct the emergency condition.

9.5.5 Start the hydraulic power unit and reduce the pressure to 15 pli.

9.5.6 Place the hydraulic control valve in the tension position and allow the belt to tension.

9.5.7 Start the belt wash system and allow the belt to pre-wet.

9.5.8 Start the belt drive.

9.5.9 Increase hydraulic pressure to normal setting (25 pli).

9.5.10 Start sludge and polymer feed systems.

9.5.11 Continue dewatering process as normal.

8.11 KLAMPRESS PROCESS TROUBLESHOOTING CHART

Problem	Probable Cause	Recommended Solution
1) Wet Cakes	<ul style="list-style-type: none"> a. Sludge rate too high b. Belt speed too fast c. Improperly dosed polymer d. Incorrect polymer for application e. Incorrect belt tension f. Incorrect polymer/sludge mixing action g. Plant process upset 	<ul style="list-style-type: none"> a. Lower sludge loading b. Reduce belt speed c. Adjust polymer rate d. Screen for optimum polymer. Arrange on site jar test with your poly representative e. Increase belt tension f. Adjusting mixing action at in-line polymer mixer g. Check plant process for trouble
2) Puddling or ponding in the gravity section	<ul style="list-style-type: none"> a. Incorrect polymer dosage b. Incorrect polymer/sludge mixing action c. Inadequate polymer concentration d. Belt not cleaning properly 	<ul style="list-style-type: none"> a. Adjust polymer feed rate b. Adjust mixing action at in-line polymer mixer c. Try various concentrations. Use post dilution H₂O if available d. Check if belt is blinded Operate brush in wash tube
3) Low Capture rate (Solids recovery)	<ul style="list-style-type: none"> a. Incorrect polymer dosage b. Sludge solids squeezing from between belts c. Belt tension (pli) too high 	<ul style="list-style-type: none"> a. Use jar test to determine optimum dose b. Reduce sludge pumping rate or increase polymer feed rate c. Reduce tension accordingly
4) Sludge squeezing from between belts into sump	<ul style="list-style-type: none"> a. Insufficient polymer b. Large weak flocculation of sludge particles in the gravity section c. Sludge loading or belt speed incorrect 	<ul style="list-style-type: none"> a. Increase accordingly b. Increase mixing action at sludge/poly mixer to decrease floc size c. Decrease sludge flow or increase belt speed
5) Uneven cake dryness at machine discharge	<ul style="list-style-type: none"> a. Poorly distributed sludge at machine inlet 	<ul style="list-style-type: none"> a. Use the level baffle and belt speed to properly distribute the sludge across the entire effective belt width

8.10 PROCESS DIAGNOSTIC CHART

Insufficient Polymer

Sludge squeezing from the belts
Large weak flocs
Poor gravity dewatering
Gravity section overflows
Poor capture rates
Wet cake

Excessive Polymer

Foaming at sludge inlet
Sludge feels "slimy"
Filtrate is foamy and slimy
Puddling in the gravity section
High polymer bills
Cake sticks on belts at discharge

Insufficient Mixing

Large clumpy flocs
Filtrate in sludge inlet is cloudy
High filtrate solids
Low cake dryness
Cake sticks to belts

Excessive Mixing

Sheared flocs
Poor gravity drainage
High filtrate solids
Sludge squeezes from belts

Proper Polymer Dosing & Sludge Polymer Mixing

Small strong Flocs
Clear Filtrate
Little or no foaming
Good drainage in the gravity section
Plowed rows of loosely structured cake at the end of the gravity section
Cake discharge falling freely
Dry cakes
High throughput