



153 E. Fifth Street Mansfield, OH 44902 Telephone 419/522-3323 FAX 419/522-6011  
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# **Bunting Bearings, LLC Delta Facility Operation and Preventative Maintenance Plan:**

**Thursday, May 10, 2012**





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## SECTION 1: BAGHOUSE INFORMATION

Location of Delta Bag house stacks:

A:	41 deg. 34 min. 34 sec.	83 deg. 59 min. 47 sec.
B:	41 deg. 34 min. 32 sec.	83 deg. 59 min. 50 sec.
C:	41 deg. 34 min. 31 sec.	83 deg. 59 min. 46 sec.

Data from 1990 stack tests

Bag house	A	B	C	Graphite
Particulate (lbs/hr)	0.58	0.92	0.96	
Lead (lbs/hr)	0.0108	0.103	0.0098	
Flow (cfm)	17,100	24,300	27,982	
Temp.	126 F	103 F	60 F	
Moisture	2.39	1.75	1.8	
CO2	0	0	0	
O2	20.9	20.9	21	
Stack Diameter	64"	36"	36"	40" x 56"
Stack Height	50'2"	28 ft	28 ft	12-1/2 ft
Sample port height	35 ft	20 ft	18 ft	Side Exit
Dust (bags/month)	3	3	1-2	
Size	ETA 2000	Wheelabrator1200	Wheelabrator1224F	Torit Downflo II
Model	7515x120	#171 Series 5S	#171 Series 5S	T2-8
CFM	74,000	40,000	30,000	3.5 SCFM
Blower	300 HP	100 HP	100 HP	15 HP
Modules	1	3	3	4 cartridge
Bags	1125	720	864	
Sq. Ft Cloth	16,663	4,608	5,530	
Type	Pulse	Sonic Horn	Shaker	Pulse
Building Height	18' (Graphite)	22'	22'	
Property line	60' East	150' North	115' East	

NOTE: The GRAPHITE baghouse does not collect lead or particulate other than graphite dust generated during the machining of graphite dies used in the continuous cast operation. This unit exhausts indoors and does not have an outside stack. The procedures described here do not apply to this baghouse.





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## **SECTION 2: OPERATION**

Baghouse "A" and "B" are connected to the continuous cast department furnaces and casting machines. The department normally operates from midnight on Sunday night until midnight on Friday night. Both baghouses will be started on Sunday night prior to starting any melting operations within the plant and remain on throughout the week until all furnaces and casting operations are completed at the end of the week. Should this schedule change, both baghouses will be on and operating at all times while melting and casting operations are being performed in the continuous casting department.

Baghouse "C" is connected to the centrifugal casting department. The department normally operates for only one shift. The baghouse will be started each day prior to melting and shut down at the end of the shift after all melting and casting are completed.



### **SECTION 3: BAGHOUSE BAG CHANGE PROCEDURE**

This procedure describes how the bags used to collect the dust captured in each of the baghouses will be changed and inspected.

1. On a weekly basis a supervisor will visually inspect the areas around each baghouse to confirm no dust is escaping from any of baghouses or dust collection areas and bags. Any evidence of dust on the ground or on the collection bags will be evaluated and handled immediately by determining where the leak is, repairing the leak, and removing the dust using a vacuum or other appropriate method of removal.
2. On a daily basis the material handler will do the following visual inspections:
  - a. Look at stack for visual signs of emissions.
  - b. Inspect top of collection bag, the collection bag itself, and the area under the baghouse for visual signs of escaped dust.
  - c. Examine the ductwork and connections between the auger and collection bag for signs dust leakage.
  - d. Determine if the collection bag needs to be changed.
  - e. If there are signs of escaped dust, report it to your supervisor immediately and then take steps to seal the leak and collect the escaped dust using a vacuum or other appropriate method of removal.
3. If during the above inspection, it is determined that the collection bag needs to be changed:
  - a. The material handler will contact his supervisor and notify him that a change is required.
  - b. Once the supervisor is available to observe the changeover visually inspect the replacement bag to assure it is in good operating condition and that there are no holes or rips in the new bag.
  - c. Shut down the auger and close the slam gate above the collection bag.
  - d. Shake the tube between the auger and collection bag to allow loose dust to empty into the collection bag.
  - e. Remove the hose clamp between the tube and collection bag and carefully remove the tube from the bag. Any dust that escapes during this process should be vacuumed up immediately.
  - f. Close and seal the collection bag and inspect the entire bag to assure no holes or defects are present prior to transporting the bag. Should a leak be detected, seal it prior to transporting the bag.
  - g. Remove the full bag from under the collection tube and install the new bag.
  - h. Insert the collection tube into the new bag and seal the connection.
  - i. Open the slam gate and start up the auger.
  - j. Inspect for leaks or signs of escaped dust.

- k. Transport the full bag to metal reclamation, weigh and tag the bag and put it in storage.
- l. Any escaped dust will be collected using a vacuum or other method of removal immediately.

#### **SECTION 4: BAGHOUSE PREVENTATIVE MAINTENANCE SCHEDULE**

1. QUARTERLY PREVENTIVE MAINTENANCE – this inspection will be down when there is no production scheduled and the baghouse can be shut down and locked out.
  - a. Visually inspect the exterior of the baghouse, motor and stack.
  - b. Open each sock compartment and inspect socks for signs of damage and proper installation.
  - c. Visually inspect the tube sheet to assure no dust is building up (clean side).
  - d. Inspect the lower portion of the baghouse hopper for signs of buildup as well as structural integrity (holes or cracks in the metal).
  - e. Inspect gauge lines leading to monitors.
  - f. Inspect Magnahelic gauges for proper operation and signs of damage.
2. MONTHLY PREVENTIVE MAINTENANCE
  - a. Check motor amp draw.
3. WEEKLY PREVENTIVE MAINTENANCE
  - a. Inspect auger and rotary valve
  - b. Inspect shake down operation. (Visual and listen)
  - c. Inspect solenoids, diaphragms, and horns.
  - d. Examine belts, pulleys, oil leaks and grease.
  - e. Visually inspect stack for signs of emissions.
  - f. Inspect stack emission monitors.
  - g. Inspect Magnahelic and Photohelic readings.
  - h. Inspect bag leak detection system (CPM 5000), meter, lines, and probes for proper operation and signs of damage.
4. DAILY PREVENTIVE MAINTENANCE
  - a. Record all Magnahelic and CPM 5000 readings
  - b. Check for air leaks
  - c. Listen for unusual noises in fans and motors
  - d. Check dump hoppers
  - e. Inspect area for visible dust and visible exhaust fumes

## **SECTION 5: BAGHOUSE SOCK CHANGE PROCEDURE**

1. With proper maintenance and care, baghouse socks will last several years. The actual timing of replacement of these socks will be based on the results of the above inspections. Evidence of sock damage, dust build up on the clean side of the baghouse, excessive emissions, either visible or detected on the stack monitors, or high magnahelic or photohelic readings will determine when socks will be replaced.
2. Purchasing Department will obtain quotes from outside contractors for:
  - a. Removal of existing socks
  - b. New socks and hangers
  - c. Installation of socks
  - d. Collection and disposal of removed socks.
  - e. Sock coating material and installation.
  - f. Available dates for the changeover.
3. After the vendor is determined, a purchase order will be placed for changeover and the date for the change will be established. No production will be scheduled during the baghouse sock replacement.
4. All materials required for the changeover should either be on site or with the contractor prior the actual changeover day. Availability of equipment used during the changeover (fork lifts and aerial equipment) should be scheduled and firmed up.
5. Confined space procedures and equipment, all personal protective requirements and lock-out tag-out procedures and equipment will be reviewed with the contractor and ready for implementation.
6. Day of changeover:
  - a. All production will be shut down and the baghouse taken out of service.
  - b. Confined space procedures, personal protective equipment, and lock-out procedures will be confirmed with the contractor.
  - c. All equipment and supplies required for the changeover will be confirmed with the contractor.
  - d. The baghouse will be locked out and tagged out per procedure.
  - e. The baghouse will then be turned over to the contractor for removal and installation of the socks.
  - f. During the procedure, Bunting supervision will monitor the area to assure no dust is escaping and that the area is being kept clean and safe. Should dust be observed, the contractors will be notified and steps will be taken to stop the contamination and clean up the dust.
  - g. After the bags are installed and the old bags are removed, the unit will be closed up, and the lockouts will be removed by the contractor.
  - h. The unit will be tested and the bag coating applied as required.



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7. After testing is complete, the unit will be turned over to the production department and production will resume.

#### **SECTION 6: GENERAL PLANT INSPECTION PROCEDURE**

On a weekly basis a supervisor or other employee appointed by the supervisor will visually inspect all of the following areas and equipment for evidence of dust or escaping fumes.

1. Baghouse stacks
2. Areas under and around each baghouse
3. Areas under and around each spark arrestor
4. All driveways and parking lots around the entire plant
5. Baghouse dust storage areas
6. All roof surfaces near baghouses and ductwork from the casting areas to the baghouses
7. All ductwork between each source and the baghouse
8. All areas where dust is handled, weighed, transferred or shipped.

In the event of finding dust or escaping dust, the supervisor will:

1. Determine the cause of dust immediately
2. Repair the problem
3. Clean up all escaped dust using a vacuum or other method of removal immediately

In the event that the cause cannot be determined or the repair cannot be made, the process will be shut down until the problem is corrected. After shutting down the process, all escaped dust will be cleaned up using a vacuum or other method of removal.

#### **SECTION 8: ACCIDENTAL RELEASE**

In the event that baghouse dust is released due to failure of the baghouse system, or during transportation or handling of the baghouse dust.

1. The cause of the release will be determined
2. The release will immediately be contained and cleaned up using a vacuum or other method of removal.
3. In situations of continued release, if the repair cannot be made, the source furnaces and processes will be shut down until repairs are complete.



## **SECTION 9: BAGHOUSE LEAK DETECTION SYSTEM**

Each baghouse is equipped with a CPM 5000 which measures particle flow with a beam of visible light through which the particles travel. The system uses a transmitter and a receiver that is mounted in each of the baghouse stacks.

### Daily Preventive Maintenance

1. Check the operation of the CPM 5000 and verify that it is displaying an emissions value (record on log).
2. Check the window value (record on log)
3. Check the operation of the purge air system
4. Visually inspect the transmitter head and receiver head housings to verify no portion is loose or distorted
5. Verify the alarms were not activated
6. Verify that the window alarm is set to 50%
7. Verify that the emission alarm is set to 10%

### Corrective Action

#### Window alarm

1. Verify unit is operating correctly
2. Review data log to determine cause for the alarm (record all data)
3. Check stack for visible emissions
4. Clean and align probe
5. Repair or replace unit if cleaning and alignment do not correct the problem

#### Emission Alarm

1. Verify unit is operating correctly
2. Review data log to determine cause for alarm (record all data)
3. Check stack for visible emissions
4. If the CPM 5000 is operating correctly and we are still getting greater than 10% emission readings, the process will be shut down, the baghouse will be locked out, and an inspection of the baghouse and sock condition will be started. The process will remain down until repairs are made and the emissions are reduced to acceptable levels.