

# ***Preventative Maintenance Plan: Lead Dust Collectors***

**DATE: February 22, 2012**

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**SECTION 1: THE CONTRACTOR SELECTION PROCESS AND ACCEPTANCE****A: INITIAL CONTRACTOR REVIEW**

- Contractors are reviewed initially prior to performing services at the 4150 East 56<sup>th</sup> location.

**B: ANNUAL REVIEW PROCESS**

- Contractors are requested to fill out review information on an annual basis.

**SECTION 2: SERVICES TO EXPECT**
**A: ANNUAL PREVENTATIVE MAINTENANCE SCHEDULE**

MATERIAL TYPE and notes	Dust Collector Emission Source(s)	Cartridge Replacement Frequency	Dust Collector Inspection Frequency	Mechanical PM / Inspection (Monthly)	Controls Inspection (Annual)
<b>Lead</b>	FEM#1 FEM#8 FEM#9 FEM#10 FEM#11 FEM#12 FEM#14	Yearly	<u>Quarterly</u> <ul style="list-style-type: none"> <li>Open the collector for visual inspection</li> <li>Cartridge condition</li> <li>Hopper interior</li> <li>Condition of 'clean air side'</li> </ul>	a) Belt integrity b) Pulleys c) Solenoids and diaphragms d) Hopper integrity e) Grease bearings f) Air flow, quarterly	a) Magnehelic b) Gauge Lines c) Timing Board d) Compressed air regulation
<b>Non-Lead</b>	FEM#2 FEM#3 FEM#4 FEM#5 FEM#6 FEM#7 CERC#4 CERC#5	Bi-annual	<u>Semi-annual</u> <ul style="list-style-type: none"> <li>Open the collector for visual inspection</li> <li>Cartridge condition</li> <li>Hopper interior</li> <li>Condition of 'clean air side'</li> </ul>	a) Belt integrity b) Pulleys c) Solenoids and diaphragms d) Hopper integrity e) Grease bearings f) Air flow, quarterly	a) Magnehelic b) Gauge Lines c) Timing Board d) Compressed air regulation

- The preventative maintenance costs are subject to change based on inspected equipment condition.

**B. PROCEDURE OF ACCEPTABLE METHOD TO FILTER CHANGE OUTS****FERRO ECGM- ELECTRONIC MATERIALS**

**FERRO CORPORATION**  
4150 East 56<sup>th</sup> Street  
Cleveland, OH 44105

Procedure: HSE-010  
Revision Number: 0.0  
Effective Date: 2/09/2012  
Supersedes: New

Author:/Approval: Thomas J. Vlach/ February 9, 2012

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**Procedure Subject: Scheduled Preventative Maintenance Dust Collector Filter/Cartridge Change Procedure.**

**Procedure Statement: Procedure to be used for changing all dust collector primary filtration and secondary HEPA filters.**

**Procedure:****Preparation:**

1. Schedule (minimum 1 week before anticipated change) with Production management (Engineering/MRP/Production Mgr./Affected area Lead)
  - a. Verify all components on hand for required change.
  - b. Order replacement to maintain two sets (25 --filters and clamp/set)
  - c. Availability of any required aerial lift equipment for elevated work.
  - d. Any required emergency response (confined space extraction, elevated rescue team).
  - e. Notification to facility Environmental, Health & Safety Department as required.
2. Day of filter changes with production management.
  - a. Production management (staff or area lead) will schedule associated source equipment to be down for the duration of the prescribed filter change.
  - b. Production management (staff or area supervision) will shut down any interior "blast gates" to ensure no potential internal release of lead/non-lead materials into areas occupied by production personnel.
  - c. Production management will verify status of shut down and release dust collection unit (including notifying security to put Solvent milling alarm system on test when servicing #12 - Solvent Mill Room dust collector) alarms on test/by-pass for duration of service.
  - d. All work permits (confined space, elevated work and non-routine work) will be reviewed with contractors.
  - e. All lockout tagout verify procedures equipment specific will be reviewed with contractor.
  - f. All personal protective requirements will be reviewed with contractor.
  - g. The approved lead waste disposal location will be reviewed with contractor.
  - h. All new components (filters, clamp, etc.) will be staged at the work area.

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- i. If dealing with lead waste (FEM 1, 5, 8, 9, 10, 11, 12, 14) sufficient 90 day totes/baskets will be staged with appropriate quantity of impervious liners. Additional liners will be supplied to place the used cartridges and filters into within the dust collector prior to removal to open air.
- j. If non-lead (FEM 2, 3, 4, 6, 7, CERC4, CERC5) totes will be supplied as well as impervious bags into which the spent cartridges will be loaded upon removal to mitigate any dust generation.
- k. For lead dust collectors disposable tarps are to be placed under and around the collector to catch any fugitive material.
  - l. Inspection of tarps and work area to be released by production management prior to commencement of any service work.
3. Upon permit review and final area inspection production will release the unit to contractor for service.
4. Contractor will use equipment specific lockout tagout procedures (located at each unit) to disable equipment.
  - a. Air supply to pulser must be shut down and bled prior to application of lockout tagout.
  - b. Primary disconnect lockout tagout,
  - c. Secondary pulser lockout tagout applied.
5. Contractor will Bump gas analyzer (Ferro verification on confined space entry permit) supplied by vendor and show evidence of calibration.
6. Contractors may then "Open" access to cartridges.
7. Contractor will verify via non-entry test fitness of atmosphere for entry and supply data to Ferro for entry upon permit.
8. Contractor may begin removal of cartridges or inspection process.
9. As cartridges are removed (max 5 at a time) they are to be placed into the provided impervious liners
10. Once loaded the bag is to be tied off (quantity to vary by individual but at no time more than five) and placed into the provided lead waste receptacle.
11. The lead waste receptacle is to remain covered at all times with exception of inserting bags with spent cartridges.
12. Upon completion of work, Ferro production management will review the work and area for cleanliness.
13. Ferro production management will sign off of cleanliness and completeness of work.
14. Ferro management will arrange removal of waste containers to designated storage area.
15. Contractor will remove lockout tagout.

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15. Contractor will remove lockout tagout.
  16. Contractor will reactivate pulsers and blowers.
  17. Ferro Production management will open any internal (building) blast gates.
  18. Operation of unit and parameters (delta P, pulse pressure, pulser timing and operation) will be verified.
  19. Work order will be signed off complete.
  20. Dust collector will be signed back into production; all affected employees will be notified as well as scheduling. All logs will be completed by contractor prior to leaving facility and contractor will review with production management.

**1. History:**

<i>Revision Number</i>	<i>Effective Date</i>	<i>Section Changed</i>	<i>Change Summary</i>
0.0	2/09/2012		Original Issue

**SECTION 3: DEFICIENCIES**
**A: Pressure Differential Logic Flow Chart**

**FERRO ECGM- ELECTRONIC MATERIALS FERRO CORPORATION**

 4150 East 56<sup>th</sup> Street  
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**Dust Collector- Pressure Differential Decision Logic Flow Chart**
