

Baghouse Black Light Test

Equipment:	All Baghouses	Date Issued:	2-8-2004
Additional Reference:	None	Revised:	no
		Revision #:	0
By:	Mark Gault, Engineer Soil Remediation	Astec Engineering Department	

PURPOSE:

The purpose of this information letter is to provide general guidelines for performing a black light test. This test is used to determine the source of visible emissions. It is highly recommended that this test be performed prior to testing a baghouse for particulate emissions (stack test), even if no emissions are visible.

PARTS and TOOLS REQUIRED:

Obtain a black light and two colors of florescent powder. These are available through the ASTEC Parts Department (1-800-251-6042). Have enough fluorescent powder for two tests, each a different color.

Astec Part number	Description	Comments
037562	Lantern (Black Light)	One required
015068	Replacement: Bulb Only	If required
003136	Orange powder	5 pounds
003137	Pink powder	5 pounds
003138	Yellow powder	5 pounds

The test requires 1 pound of powder for each 1000 square feet of bag cloth. Refer to the charts below for individual bag cloth areas. Multiply the area per bag by the numbers of bags in the baghouse. This product divided by 1000 will give you the minimum amount of powder you should use. Note: it is almost impossible to use too much powder, not using enough powder may not coat all the areas being tested.

Bag Length	5 ft	6 ft	6.5 ft	7 ft	7.5 ft	8 ft	10 ft
Cloth Area per Bag, 4-5/8" Ø (Astec)	6.1 ft ²	7.3 ft ²	7.9 ft ²	8.5 ft ²	9.1 ft ²	9.7 ft ²	12.1 ft ²

Bag Length	6 ft	7 ft	8 ft	9 ft	10 ft	12 ft	14 ft
Cloth Area per Bag, 5" Ø (Barber-Greene)	7.85 ft ²	9.2 ft ²	10.5 ft ²	11.8 ft ²	13.1 ft ²	15.7 ft ²	18.3 ft ²
Cloth Area per Bag, 5-1/8" Ø (Barber-Greene)	8.05 ft ²	9.4 ft ²	10.7 ft ²	12.1 ft ²	13.4 ft ²	16.1 ft ²	18.8 ft ²

A MUST-DO BEFORE ANY STACK TEST

Visible dust emerging from the exhaust stack of a baghouse that has been in service long enough to season the bags usually indicates leaks either in the bags or tubesheet. An inspection of the clean air chamber may reveal the source of the leak(s).

1. After running the plant, look for patterns of dust on the tubesheet, exhaust ductwork, and exhaust fan.
2. Take care not to disturb these patterns, as they will be down stream of each leak.
3. Fix all leaks that can be found in this manner, starting at the end of the baghouse away from the fan. Repairs will generally consist of simple bag replacement or re-seating.
4. If the baghouse is still not performing satisfactorily after making these repairs, a black light test must be conducted.

BLACK LIGHT TEST

This test should be performed at the end of a normal operating day after previous inspections, repairs and replacements have been completed. Two people are required to effectively perform this procedure.

1. Obtain a black light and two colors of florescent powder. These are available through ASTEC Parts Department (1-800-251-6042).
2. Have enough fluorescent powder for two tests, each a different color. (NOTE: The test requires 1 pound of powder for each 1000 square feet of bag cloth. Refer to the charts included in **Parts and Tools Required** for individual bag cloth areas.)
3. Schedule the test at night if possible so the fluorescent powder will be easier to see using the black light.
4. Lock out the power to other plant equipment except the baghouse.
5. Keep all personnel not directly involved in the test away from the baghouse.
6. With the baghouse at operating temperature, continue to run the pulse system to obtain a low differential pressure ($\Delta P \approx 1 \text{ inWC}$) across the tubesheet.

7. With the baghouse damper closed, open an inspection door in the dirty air chamber, preferably at the cyclone or inertial separator, or make a port in the baghouse inlet duct. A small opening is preferred.
8. Slowly open the damper to increase airflow through the baghouse without overloading the motors. If you are using an access door, secure the door by blocking or tying it open to prevent sudden closure as suction increases when the damper is opened.
9. One person is to sprinkle the fluorescent powder into the air stream drawn through the opening, at a rate of approximately one pound per minute. Using a tube through the opening as a vacuum hose for suctioning the fluorescent powder into the baghouse is easier to control than holding the bucket of powder up to the door.
10. Run the fan for an additional 10 to 15 minutes after the powder has been put into the baghouse. Allow the cleaning system to continue to pulse. Then, shut down the fan and lock out power to the baghouse.
11. After the baghouse has cooled to a tolerable temperature for entering, start your inspection at the inlet end, away from the fan. Open and inspect each module, one at a time, with the black light. The second person should conduct the inspection because the one that introduced dust into the system may have fluorescent residue on their clothing that could interfere with the test results.
 - a. Take off and return the module covers carefully, so as not to disturb the telltale fluorescent patterns on the top of the tube sheet.
 - b. Make a note of each leak location but postpone repairs until the entire clean air compartment has been inspected.
 - c. Large leaks will be indicated by a fluorescent pattern spreading out across the tube sheet from the leak point, toward the fan. These leaks will look similar to an anthill starting at the edge of the cage top.
 - d. Fluorescent powder inside a bag or on top of the bag cuff indicates a leaking bag, which must be replaced.
 - e. Fluorescent powder around the base of a bag cuff at the tubesheet indicates that the bag is not completely sealed against the tubesheet. It may simply require reseating.
 - f. Fluorescent powder seen at any seam or joint of the baghouse clean air chamber indicates a leak in the internal structure. (NOTE: These leaks should be sealed by welding or with silicone caulk.) Re-welding of welded seams is preferred over silicone. Silicone is preferred over welding on mechanical (bolted) joints only.
12. Repair each leak noted from the examination of the tubesheet and bags.
13. Re-test the baghouse using another color fluorescent powder.
14. If no leaks show up after the second test your house is properly prepared for a stack test. Else, continue to repeat the test and inspections until fluorescent powder is no longer visible on the tubesheet.