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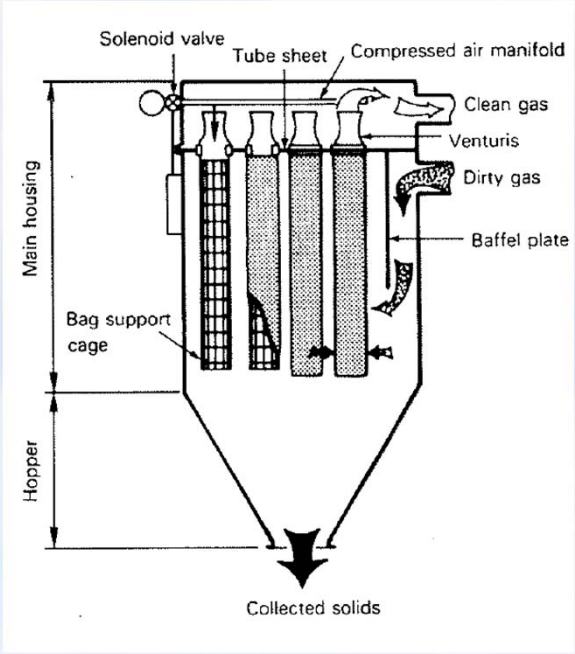

Baghouse Nuances: What to do when a Baghouse Source Test goes Rogue

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Baghouse Basics

- Design phase
- Air system
- Bags
- Maintenance

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Design phase

- Most critical parameters are flow rate and particulate loading
  - Higher efficiencies gained with lower velocity of air through filter
  - Must balance needs: lower velocity means more filterable area (aka, bigger baghouse, more capital cost)
- Carefully choose materials of construction
  - Look at chemical profile of exhaust stream
  - Look at climate

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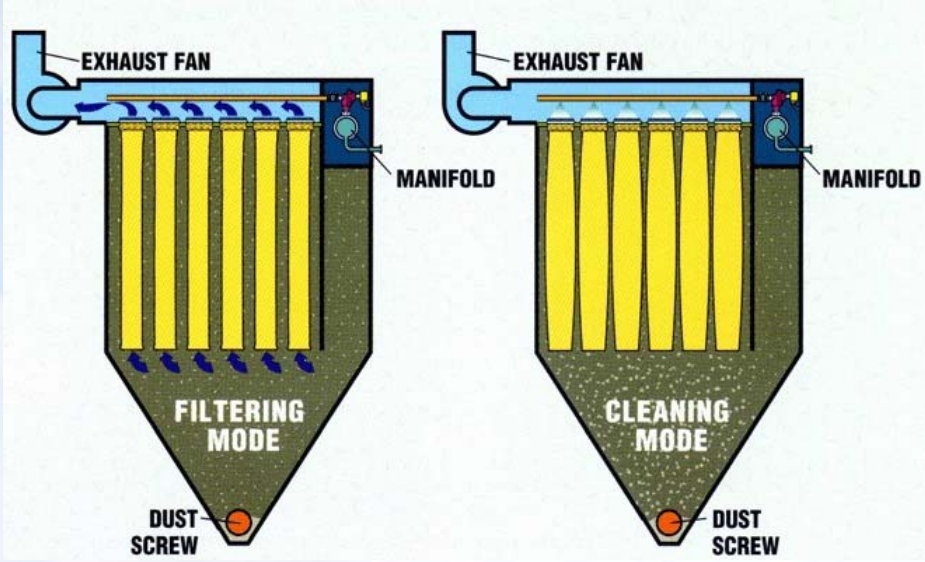
Air system

- Components of Air System
  - Fan
  - Compressed Air System
    - Regulators
    - Dryers
    - Receivers
  - Valve Actuators
  - Pressure Gauges



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Bags (1 of 2)

- Understand your bag type – conventional vs. membrane
  - Does it need a seasoning period to achieve peak performance?
- Must be designed for chemical profile of exhaust stream
  - Exhaust temperature and moisture
  - F and Cl and SOx

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Bags (2 of 2)

- Bags are a bit custom designed – be careful of using different vendor
- Watch how it fits in cage/tube sheet
  - Snap band should fit snug against tube sheet
  - Bag should be tight to the cage, not loose

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Maintenance

- Stop, Look, Listen
- Watch for buildup in the hopper of baghouse
- Check baghouse before test
  - Physically check – turn fan off and open door on clean side
    - If PM on tube sheet, clean it
    - Change bags if needed
    - Look for anything indicating a leak
  - Check performance of bag leak detection system and pressure gauges
  - Trust but verify

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When you get a rogue test result: Case Study #1

- Plant personnel says they've checked everything and they are "good to go"
- Fail stack test
- Root Cause – Caked-on PM on the clean side of the tube sheet, was never checked before conducting the stack test

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When you get a rogue test result: Case Study #2

- Plant personnel says they've checked everything and they are "good to go"
- Fail stack test
- Further investigation reveals simple cause
  - Tube sheet had buildup of PM on clean side
  - 18 broken bags found
  - Bag Leak Detector had been disconnected from PLC, showing no indication of failures

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When you get a rogue test result: Case Study #3

- Baghouse seems to be working fine
- Stack test runs results in gradually higher emission rates at 1.3x, 2.1x, and 3.6x the limit, respectively; pressure drop steady
- Facility decides to re-test with new bags and other maintenance refinements
  - Same results – emission rates up to 5xs limit
  - Pressure drop still steady

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When you get a rogue test result: Case Study #3 (2 of 5)

- At end of stack test, looked inside and found that buildup from bottom of baghouse reached bags and pulled them down
  - Ordered weighted tip valve to ensure timely release of buildup
  - Also considered auger system
- Bigger issue: Realized that some of the pulse bar holes had worn into a large slot caused larger than needed air pressure and worn seals on the bags

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When you get a rogue test result: Case Study #3 (3 of 5)

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When you get a rogue test result: Case Study #3 (4 of 5)

Eventual culprit was a faulty air regulator on the pulse system. In addition, moisture had also infiltrated the system due to a temporary compressor that had been operating without a dryer.

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Final thoughts

- Prior to the test – Trust but Verify!
- Diagnose before you prescribe
- Know your process
- Tools to assist
  - Monitors that determine if disturbances occur during pulsing
  - Bag Leak Detectors in every compartment

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Questions/Comments/ Experiences

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