

## ENVIRONMENTAL COMPLIANCE . . .

### “WHERE DO I START?”

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Today's environmental compliance is more complicated and changes more frequently than any other aspect of our business. The most frequent question I am asked is, "Where do I start?" My answer is always the same. You have to understand what your current permits require and you have to start with the equipment you have today. Your current permit tells you what you need to achieve to be compliant, over which you have little or no control. Optimizing your present equipment is your greatest opportunity to gain compliance. Do you have a written policy/procedure for setting up how your collector should be operated? Generally having your operating protocol in writing produces better results. Here are some starting points:

#### ***System Overview***

You need to begin by evaluating the entire collector system for holes, openings and integrity of all its components, including the collector, duct work, pitot tubes holes and door gasketing. Seal all atmospheric leaks so that you will have a leak-tight system.

#### ***Valve and Solenoids***

Valve and solenoid functions should be reviewed at the same time. When listening to the baghouse cleaning system, all of the valves firing should sound similar. When they do not, there is a problem with the valves and/or solenoids. Generally valves and solenoids should be rebuilt completely every 12 to 18 months. Temperature, operating time and quality of compressed air all has an affect on repair frequency. Valves that are over 15 years old are likely reaching the end of their working life. The cost of replacing them is often less than the repair costs when you consider both labor and material. New valves have substantially better performance than the older valve design. If the valves are of the remote design, the hoses and connections need to be checked and repaired as necessary. Remote valves should not have hoses longer than six feet and should not have any restriction in their connector hoses.

***Inlet Baffles/Diffusers***

The inlet baffle/diffuser or target plate is essential to the collector's operation. They should be part of a preventative maintenance plan and reviewed on a regular basis. Since these are wear-point, they will need repairing or replacing periodically.

***Dew Point***

Signs of dew point are water in the collector for unexplained reasons. Moisture will often combine with particles, causing material build up near the inlet. If your filter consumption is elevated in the cool, cold or wet times of the year, you could have an atmosphere leak in your collection system or you could be going through dew point. Both the collection air and/or the compressed air are subject to dew point. If your compressed air is going through dew point, your filter elements will blind from the inside out. To eliminate dew point you need to raise the operating temperature of the collector or insulate the collector and/or the compressed air line.

***Delta P Control***

Your collector's operating Delta P can be measured/controlled by a Magnehelic®, Photohelic® or a pulse-on-demand system, which may or may not be viewed in the control room. These instruments are essential to the accurate operation of your cleaning system. If the dirty side line or the instrument becomes plugged, you can ruin a set of filter elements in a matter of hours in heavy loading. To ensure that your pulse control equipment is adequately protected, an In-Line Instrument Filter (ILIF) or an automatic Tube Line Cleaner (TLC) should be installed as part of your preventative maintenance program.

***Leak Testing***

Having complete all of the preceding, you need to establish that you have a complete seal between the clean-air and dirty-air plenums. While visual inspections should always be part of your preventative maintenance policy, a dye test will show you things not normally seen by the human eye. Finding those leaks may be the difference between compliance and non compliance.

***Operation Review***

The following operational parameters are meant for pulse jet collectors cleaning on-line using felted media or synthetic pleated elements mounted vertically.

***Element Cleaning***

Cleaning your elements is one of the primary parts of your success or failure. We would recommend pulsing at 90 – 100 psi with the duration set at 150 milliseconds. This formula maximizes the blowpipe peak pressure and generates the highest volume of cleaning air possible,

which develops the greatest bag snap or harmonic vibration, allowing your pulse air to be the most effective. A control board with an automatic, off-line pulse-down feature is often advantageous in heavy loading operations.

### ***Pulse Sequence***

Valves needed to fire in a random pattern so as to avoid cleaning the row adjacent to the one last cleaned. Random firing will help stabilize your cleaning at a less frequent basis and extend your bag life. Additionally, random firing tends to help equalize hopper loading.

### ***Cleaning Air***

Cleaning air needs to be clean and dry. This can be accomplished with drop-out "Ts", air and oil separators, air dryers and/or other mechanical devices. Their positive affect will extend filter and cleaning system life while reducing your cleaning requirements

### ***Reservoirs/Air Headers***

Reservoirs/air headers need to have an unrestricted supply line equal to the diameter of the blowpipes and they need to be adequately sized for the valves you are using. Typically a 3/4" valve needs about 0.72 cubic feet of air, one-inch valve needs 0.96 cubic feet of air, and a 1 1/2" valve needs 2.4 cubic feet of air. High demand systems will likely require an auxiliary high-pressure tank with an enlarged supply line to the existing reservoir.

Pulse frequency should then be set to accomplish a balanced delta P of 3" to 6" w.g. The cleaning frequency should never be greater than the reservoir's ability to recover to full pressure.

Generally only one valve should be fired out of a header at a time. Firing two or more valve out of the same reservoir simultaneously will generally result in the valve being volume starved. This results in poor cleaning and premature bag failure. Ideally, after the valve fires, your reservoir pressure would not drop below 85% of the firing pressure.

Using felted, non-membrane, filter bags requires a filter cake to accomplish the particulate removal. You need to create a balanced delta P, which leaves your primary filter cake, yet removes the surface loading. High delta Ps will give you great particulate removal. However, they can reduce your throughput to the point that some collection points lose their capture velocity and generate fugitive dust.

### ***Hoppers***

Hoppers should not be used as storage vessels. The more material you let accumulate in the hopper, the more loading your filter elements will see because the air movement in the collector will pick material out of the hopper and recirculate it among the filter elements. If you have

accumulation in the hopper, increase the frequency of your evacuation system or enlarge the evacuation system.

### ***System Balancing***

You will need to know the total ACFM of your system and ensure that your pick-up points have adequate capture velocity to move the fugitive dust to the collector without taking excess product away from the process.

### ***Filter Design and Media***

When you have completed the overview and adjusted the operating parameters, you can now evaluate where you are in terms of compliance. If you are in compliance and have adequate capture velocity/throughput for all your processes, then you have succeeded. Now you can plan for your next permit. If your emissions are fine but your throughput is inadequate, you have at least two filter element options, conventional bags with a PTFE membrane or pleated bags with or without a membrane. We are seeing a larger movement to pleated elements because of their significance in throughput, higher efficiencies and longer life. If you still have emission problems, the solutions are the same as above. Both pleated bags and PTFE membrane help control emissions when properly applied.

Maintaining a collector is an hourly, daily, weekly necessity. Letting items go unrepaired can **cost** you as much or more than a breakdown of your primary production equipment. Once you implement a consistent, preventative maintenance plan and operation policy, your collector will become more predictable, less demanding of your maintenance time and have improved performance. If you do these few things you might find that compliance is within reach with the equipment you have today.

**For more information on environmental compliance and baghouse/dust collector maintenance, please call your technical sales representative at +1.540.667.8500 or 800.336.7300 today.**