

Industrial Ventilation

Industrial Ventilation - 8. Troubleshooting

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What is covered in this document?

This document is part of a series of documents on industrial ventilation, and includes general troubleshooting tips.

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What are some troubleshooting tips for hoods, ducts, air-cleaning devices and fans?

| Exhaust Hood | |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Problems | Possible Cause(s) |
| Low Capture Velocity | <ul style="list-style-type: none"> • Hood located too far away from process or operation generating point. • Cross drafts or turbulence close to hood. • Blocked duct work. • Fan malfunction. • Increased resistance through air-cleaning equipment. |
| Reduced Face Velocity | <ul style="list-style-type: none"> • Unauthorized enlargement of the opening of an existing hood. The face velocity at the hood will decrease resulting in the escape of contaminants held back by the original face velocity. |

| Ducts | |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Problems | Possible Cause(s) |
| Constant Plugging | <ul style="list-style-type: none"> • Inadequate transport velocity (speed). • Flexible ducts used in place of rigid ducts (results in extra friction loss). • Condensation of salts. • Dented ducts. • Elbows with sharp turns. • Holes in ducts. • Disconnected or broken branch connections. • Closed or partially closed dampers (blast gates). • Addition of hoods and branches to the system without making adjustments to rebalance the ventilation system. |

| Air Cleaning devices | |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Problems | Possible Cause(s) |
| Frequent clogging | <ul style="list-style-type: none"> • Improper filter type and/or installation. • Improper bag cleaning cycles. • Water intrusion into the filter. • Filter hopper not continuously emptied and cleaned. • Improper "clean start-up procedure" for new bags. |
| Visible dust in baghouse on the clean air side or in exhaust stack | <ul style="list-style-type: none"> • Bags installed improperly. • Torn or damaged bags. • Leakage between bags and housing. • General filter fabric failure. |
| Sudden increase in pressure drop | <ul style="list-style-type: none"> • Excessive dust loading due to lack of maintenance and scheduled cleaning. |
| Dirty re-circulated air | <ul style="list-style-type: none"> • Dirty filters. • Air bypassing filter section (rip or tears in filter). • Dirty air handling cabinet housing. • Exhaust stacks placed close to supply air intakes. |
| Visible mould or slime | <ul style="list-style-type: none"> • Drain pans not operating properly. • Drain pans overflowing. |

| Fan | |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Problems | Possible Cause(s) |
| Vibration | <ul style="list-style-type: none"> • Out-of-balance fan impeller. • Material on fan blades. • Loose fan housing or foundation bolts. • Fan running backwards. • Vibrating ducts. |
| Noise | <ul style="list-style-type: none"> • Foreign material in fan housing. |
| Insufficient air flow | <ul style="list-style-type: none"> • Fan running backwards. • Fan speed too slow. • Dirty fan blades. • Actual system has more resistance than designed for. • Dampers closed. • Leaks in duct work. • Dirty or clogged filters in air cleaning device. • Obstructed fan inlets causing system effects (No straight duct runs at fan inlet or outlet). • Fan not getting adequate make-up air. |
| Excessive air flow | <ul style="list-style-type: none"> • Access door open. • Filters not in place or tears in filters. • System resistance low. • Fan speed too fast. |
| Fan does not operate | <ul style="list-style-type: none"> • Blown fuses. • Broken belts. • Loose pulleys. • Electricity turned off . • Fan impeller touching housing. • Wrong voltage. |

| Fan | |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none">• Motor too small (overload protector had broken circuit).• Low voltage.• Fan load too large for motor.• Seized bearing. |

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