

Lessons Learned Dust Emphasis Team Inspections On-Shift Examinations

By Roy Baker
District 4 Health Supervisor

Part 75 – 75.362 (a)(2)

On-shift Examinations

- ▶ Examination to assure compliance with respirable dust controls in the Approved Ventilation Plan
 - Within 1 hour of shift change if there is no break in production (Hot-Seating)
 - Prior to resuming production if there is a break in production at shift change
- ▶ Deficiencies corrected prior to production beginning or resuming

Part 75 – 75.362 (a)(2)

On-shift Examinations

- ▶ Examination includes:
 - Air quantities and velocities
 - Water pressures & flow rate
 - Excessive leakage in water delivery system
 - Water spray number and orientation
 - Section ventilation & control device placement
 - Work practices in plan
 - Any other dust suppression measures

Part 75 – 75.362 (g)(2)

On-shift Examinations

- Certified person conducting the on-shift examination to assure compliance with the respirable dust control parameters was not certifying by initials, date, and time that the examination was made.

Water Spray System Examination

- Sprays used were not approved in the plan
- Water flow rate incorrect
- Pressure was not being checked on both sides of the Continuous Miner and multiple locations on Longwall
- Dirty sprays were producing an ineffective spray pattern

Scrubber Examination

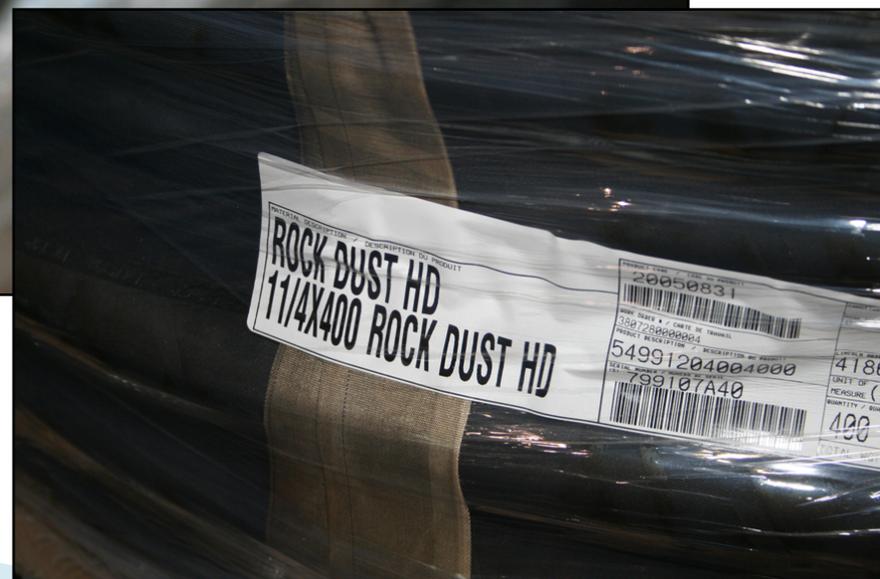
- ▶ Full Pitot Traverse checks of the scrubber were not being conducted and some folks did not know how to conduct the required checks or how to establish a centerline correlation factor (Average velocity divided by centerline reading) for use throughout the week for a comparison depending on your plan requirements.
- ▶ Scrubber sprays were not being checked to make sure they were working and covering the entire area of the screen.
- ▶ Different size screens were being used besides what the plan required. Examples– 20 mesh, 30 mesh, or bottle brush type
- ▶ Seals around screen doors and demister were missing or damaged.
- ▶ The bottom of sumps were found clogged.
- ▶ Deflector vents were damaged to keep from directing exhaust toward ribs and a few were found missing.

On-shift Parameter check of Roof Bolting Machines



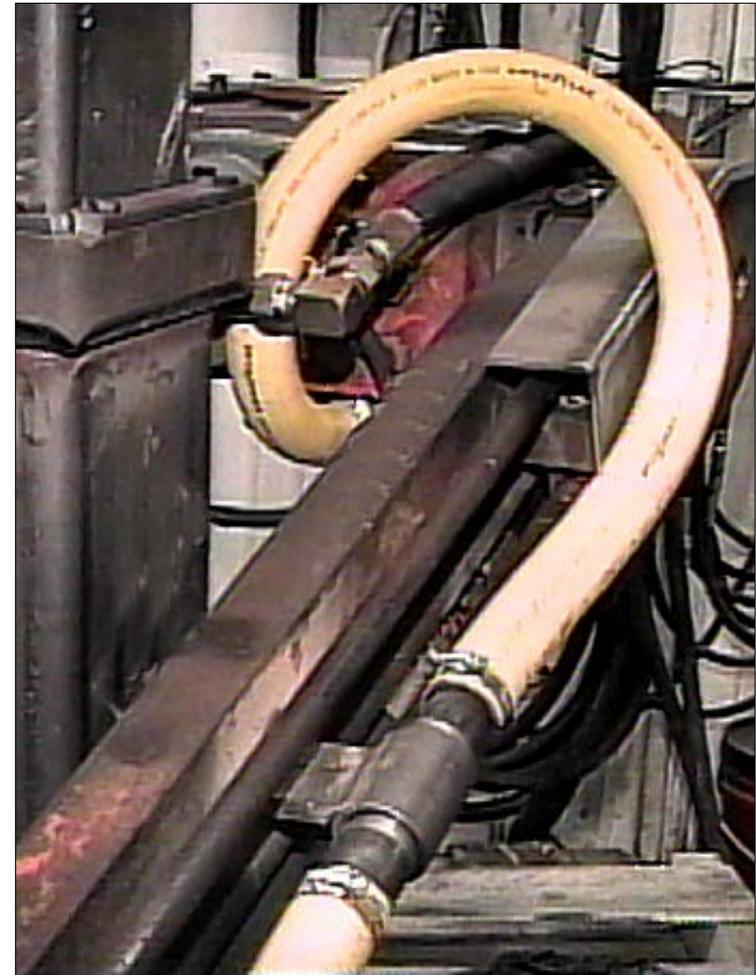


MSHA Approved Dust Hose



INSPECTION AND MAINTENANCE - DUST HOSE, FITTINGS AND CLAMPS

- Check for and Fix Any Leaks
- Check for Hose Wear and Replace if Required
- Hose Clamps – Installed and Tight

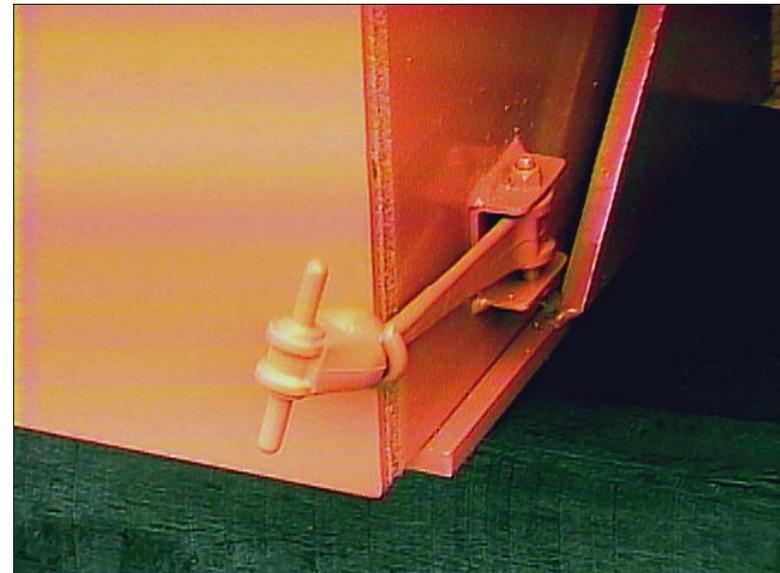
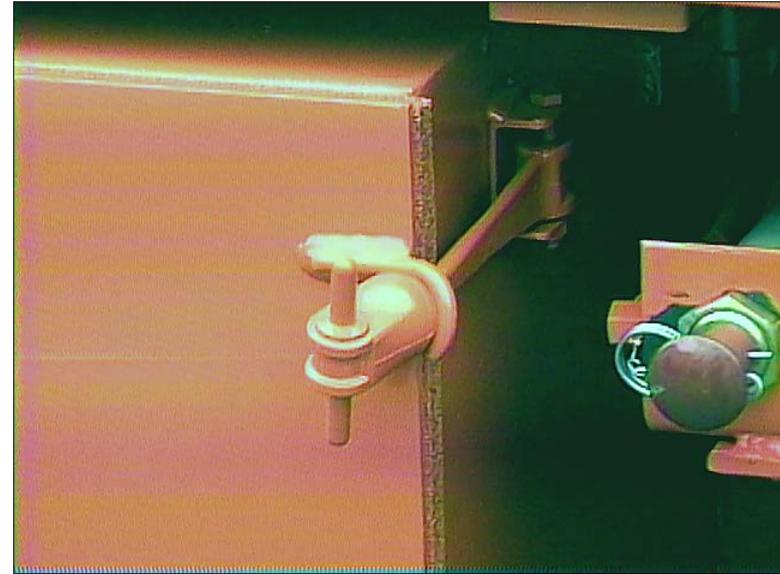


INSPECTION AND MAINTENANCE

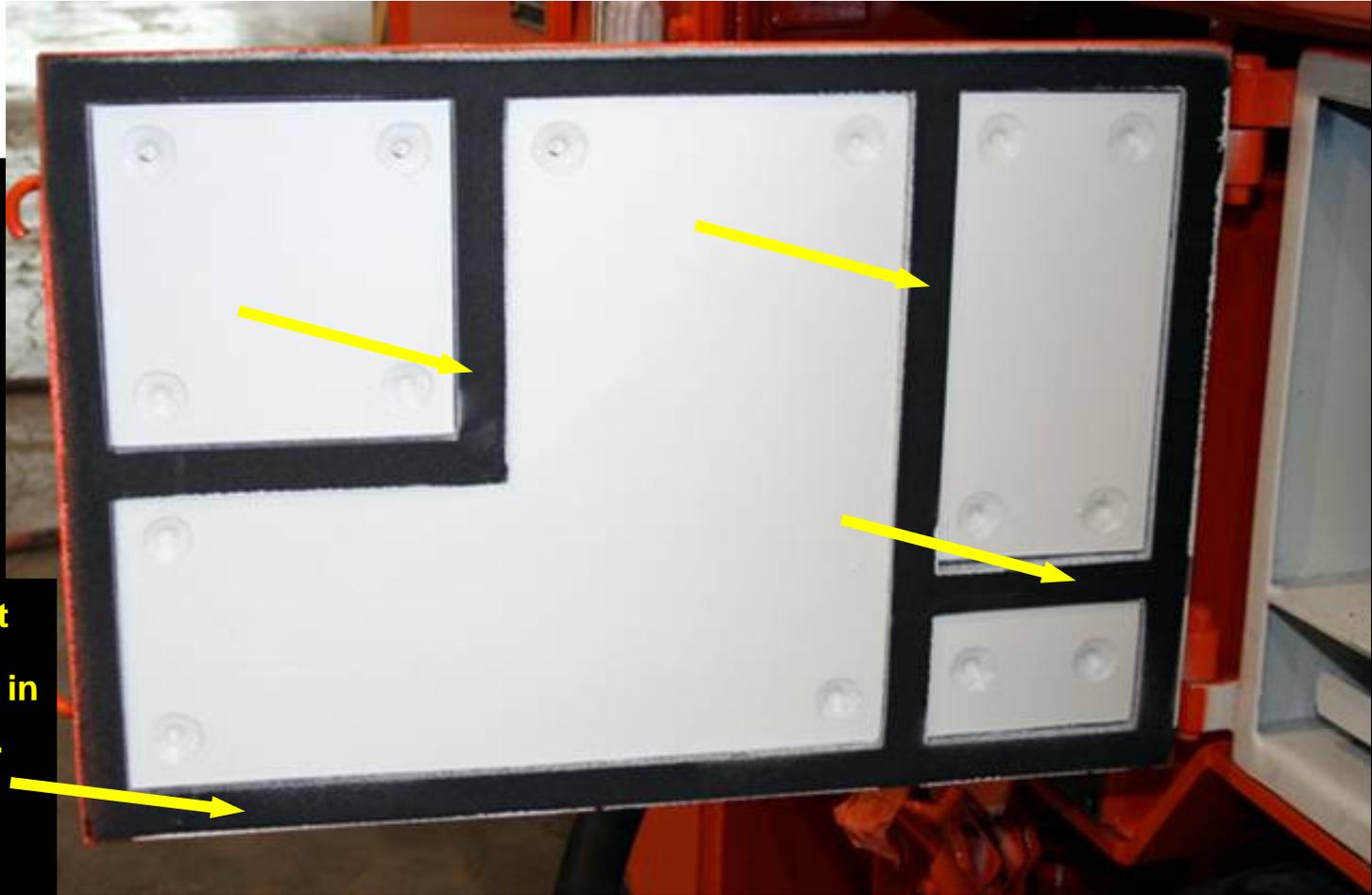
DUST BOXES AND FILTER ELEMENTS...

Door Latches

- If damaged replace with Fletcher OEM dust tank latch only.

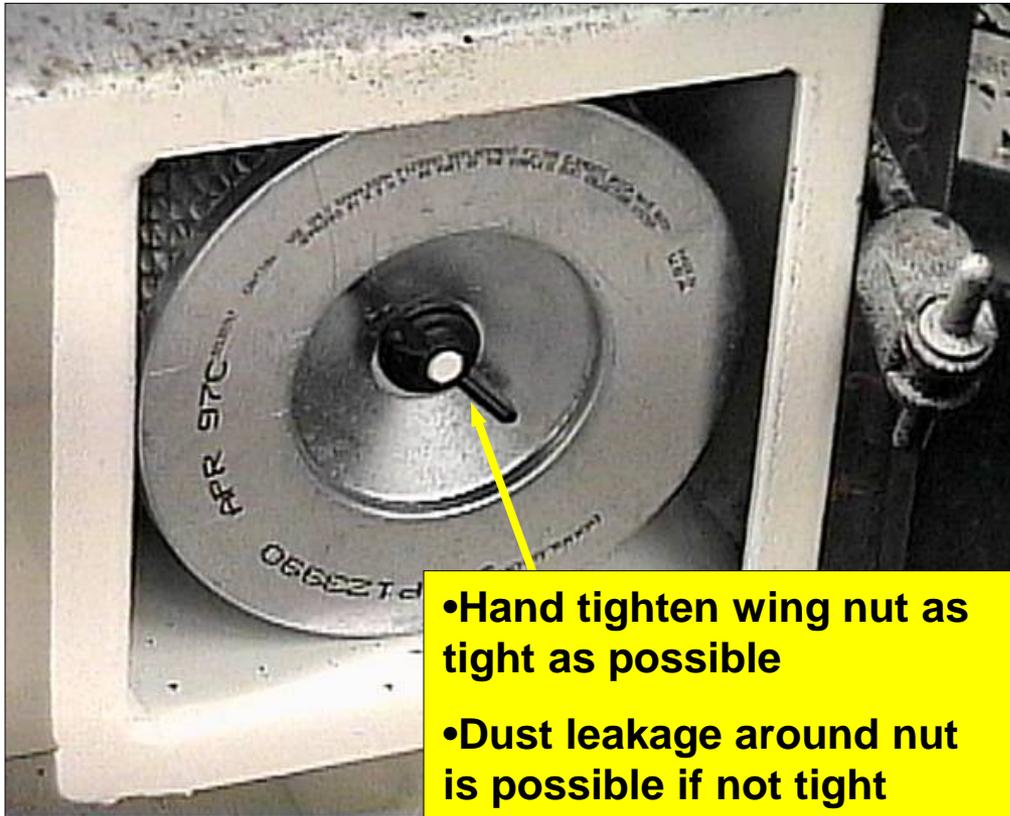


Doors and Door Gaskets

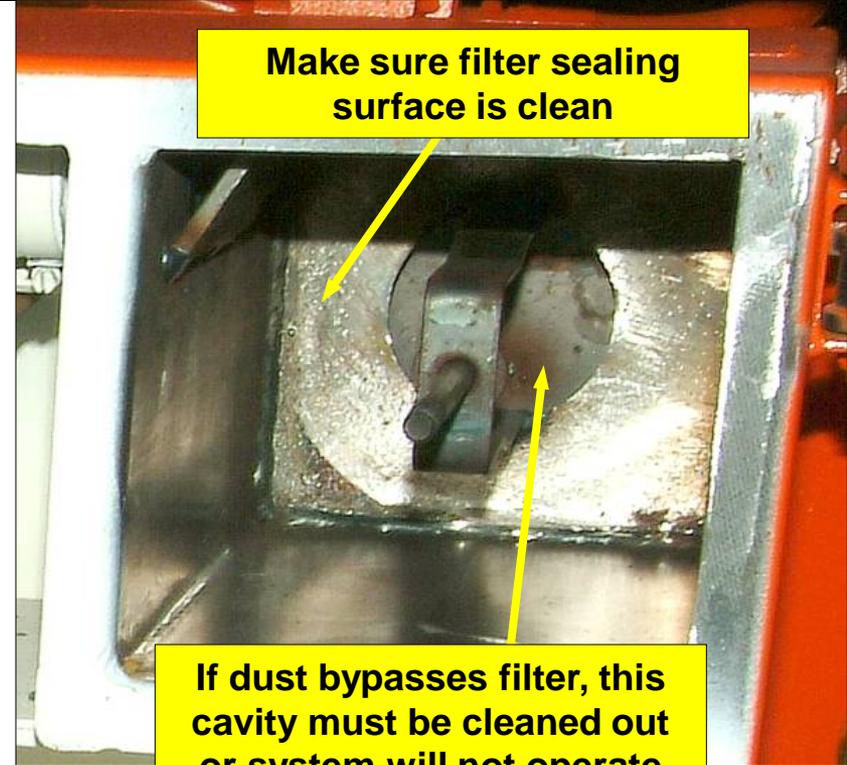


- Doors not warped or bent
- All gaskets installed, in good condition and clean.
- Each chamber must be separated. Check for air leaks and replace gasket if necessary.
- Use only OEM gaskets

Filter Elements

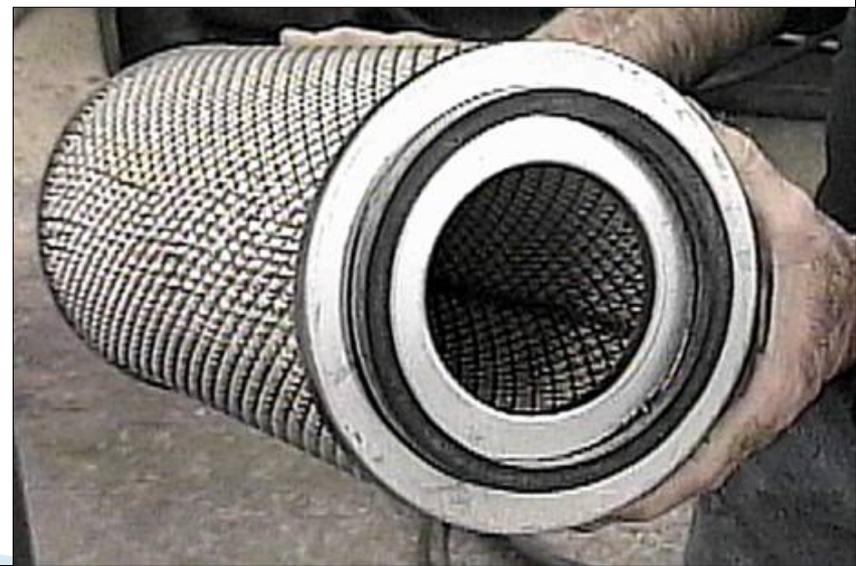


- Hand tighten wing nut as tight as possible
- Dust leakage around nut is possible if not tight



Make sure filter sealing surface is clean

If dust bypasses filter, this cavity must be cleaned out or system will not operate properly.



Never attempt to clean filter elements.

Remove and properly dispose of dirty element.

Install new approved element when dust collection efficiency decreases to the point that drilling rate is reduced. Clean box area of dust before installing new clean filter or dust can contaminate clean side of system.

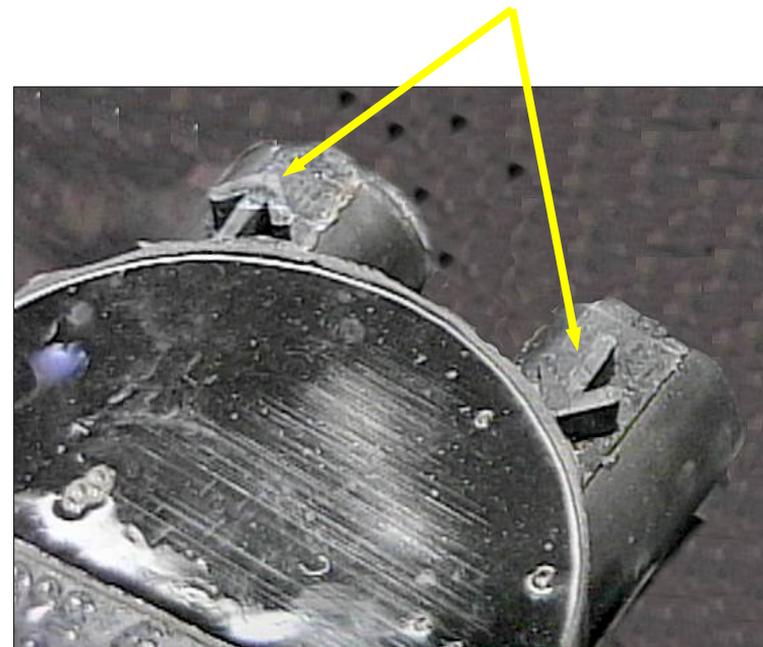


Cyclone Cap

PN: 56362

**MAKE SURE HOSES ARE
CONNECTED CORRECTLY**

AIRFLOW DIRECTION ARROWS



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LESSONS LEARNED

DUST EMPHASIS TEAM INSPECTION FINDINGS WATER DELIVERY SYSTEMS

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FINDINGS OF THE DUST EMPHASIS TEAMS

❖ **Water delivery system problems found**

- ✓ Inadequate water pressure
 - Undersized pump
 - High resistance in pipe system
- ✓ Inadequate water volume
 - Too small diameter water line
- ✓ Poor water delivery to face equipment
 - Hose size
 - Piping on machine
 - Wrong sprays

FINDINGS OF THE DUST EMPHASIS TEAMS (cont.)

- ❖ **Water related Dust Controls Specified in Ventilation Plan are Ambiguous**
 - ✓ Type of water sprays cover wide range of options – can not be evaluated
 - Specify BD-2, BD-3, BD-5 can be used
 - Spray flow rates 0.42 gpm to 1.6 gpm
 - Spray type 3
 - Spray XX or equivalent

FINDINGS OF THE DUST EMPHASIS TEAMS (cont.)

✓ Water sprays

- Required sprays not used
- Lower water flow rate
- Lower water pressure
- Sprays are not maintained – dirty, do not produce spray pattern

Quickly Recognizing Problems Can Maintain Nozzle Performance, Quality and Efficiency

❖ Seven Reasons Why Nozzles Don't Perform Properly

✓ Erosion and nozzle wear

- Wear of the nozzle orifice and internal flow passages
- As a result flow is usually increased, pressure may be decreased and the pattern may become irregular
- Nozzles should be checked with a pressure gage and flow meter - when flow rate is 15% above published value this nozzle should be changed

✓ Corrosion

- Nozzle surface breaks down due to chemical action of sprayed material or environment
- Nozzles that are corroded should be changed
- Certain materials used to produce nozzles are more durable than others
- Choose your nozzle based on in mine conditions

✓ High temperature - Not usually a factor in coal mining

✓ Caking or bearding

- Build up of material on the orifice due to liquid evaporation
- Water quality can greatly affect this (hard water)
- Typically a problem with atomizing nozzles
- Caked nozzles should be replaced

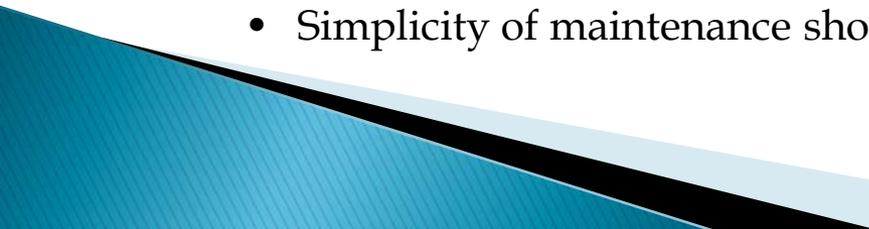
✓ Damage

- Damage to the orifice can occur when improper cleaning tools are used
- Meaning - nails are not good for cleaning nozzles

✓ Clogging

- Material clogs the orifice and the spray pattern is not evenly distributed
- Good filtration systems can help avoid this

✓ Improper Assembly

- Some nozzles require careful reassembly after cleaning
 - Simplicity of maintenance should be considered (the fewer the parts the better)
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Considerations when Ensuring Water Delivery System Meets Plan Requirements

❖ SOURCE OF THE MINE WATER

- ✓ Public
- ✓ Water storage tank
- ✓ Surface water – pond/stream

❖ FILTRATION TO MAINTAIN A CLEAN WATER SUPPLY

- ✓ At source
 - ✓ On MMU
 - ✓ Maintain filtration system
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Other Considerations

- ❖ **Number and Type of MMU's you will use**
 - ✓ Continuous Miner
 - Dust suppression sprays
 - Scrubber
 - Wethead Miner
 - ✓ Longwall

- ❖ **Other Water Needs**
 - ✓ Belt transfer points
 - ✓ Regulatory requirements for fire fighting

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Lessons Learned Dust Inspections

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Operator Sampling Program

▶ Sampling Unit

- ❖ Equipment (sampling units) not maintained as approved
- ❖ Flow rates not maintained at 2.0 L.P.M.
- ❖ Sampling head assemblies are not cleaned and inspected
- ❖ Pre-sampling shift checks :
 - Black hose used
 - No voltage checks made
 - Pump and apparatus assembled prior to 3 hours before the start of the start of shift

▶ Sampling Procedures

- ❖ Respirable dust samples are not collected at required times (shifts/days)
 - Example : 14 days to take 5 valid samples with full production, 3 shifts a day.

Operator Sampling Program

- ▶ Sampling Procedures
 - ❖ Certified persons do not know the regulatory requirements for the proper collection of respirable dust samples
 - A Control Filter sent in as a Regular Sample
 - 1 Control Sample sent in for 5 separate respirable dust samples
 - ❖ Improper record keeping for length of shift
 - ❖ Maintaining sample in appropriate location:
 - ❖ Belt DA Sample found too far away
 - ❖ Operating sampling unit portal-to-portal
 - ❖ Full Shift Sampling

Air Quantity

- ❖ Air at end of curtain does not match plan
 - Example: Lower air quantity due to curtain found 16" off the mine floor.
- ❖ Air not balanced with scrubber quantity (blowing face)
 - Example: Too much air quantity at end of line curtain (More than limits of Plan).

Dust Scrubber

Scrubber quantity lower than plan quantity

- ❖ Air quantity measurements performed incorrectly
 - Plugs in Pitot holes
 - Not testing all Pitot holes
 - Holes between scrubber screen sprays and screen

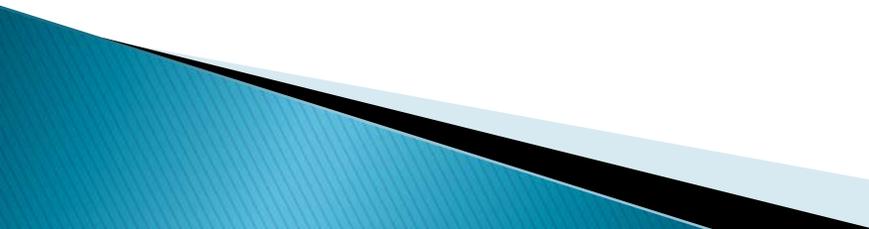
Dust Scrubber

- ❖ Ductwork dirty/plugged
 - ❖ Screens not dried per Plan
 - ❖ Demisters found with 1 inch thick sediment on layer filaments
 - ❖ Sump pump not working
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Roof Bolter Dust Collectors

- ❖ Dust box door seals not maintained – Non-approved seals
 - Ex. weather stripping from home improvement store
- ❖ Vacuum hoses do not match approval requirements and found leaking
- ❖ “Clean” side of collector contaminated
- ❖ Dust box door latches not maintained
- ❖ Vacuum setting does not meet approval plate

Roof Bolter Dust Collectors

- ❖ Non-Approved Hoses being used (electrical conduit)
 - ❖ Electrical tape covering up holes
 - ❖ Clean Side of system contaminated with white fine dust
 - ❖ Latches missing; Door hinges broke; Mine sealant used to seal door.
 - ❖ Vacuum pressures to low, Hoses not clamped onto barbed connector's.
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Roof Bolter Dust Collectors

- ❖ Valves installed in the dust collection system.
 - ❖ Low pressure found when valve to dust collection box turned off.
 - ❖ Door Seals “pieced” together with and without approved seals.
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Dust Controls not being Maintained According to Approved Ventilation Plan

- ▶ Water sprays
 - ❖ Required sprays not used (1MM sprays used instead of 3/32")
 - ❖ Lower water pressure (dirty filters, inside of hoses collapsed).
 - ❖ Sprays not maintained—dirty, do not produce spray pattern.

Dust Controls not being Maintained According to Approved Ventilation Plan

- ❖ Mag Gauges not maintained
 - ❖ Holes on adapters of Mag Gauges plugged with dirt/sediment
 - ❖ Loose adapters on Mag Gauges
 - ❖ CMO's do not know Plan requirements (Scrubber screen needs cleaned every 40 feet of advancement).
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