WANT TO CONTROL DUST?

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Introduction

Benefits of Dust Collection
New OSHA Activities
Dust Collection Technology
Installation and Use Tips
BENEFITS – Worker Attitude

- Reduction in allergies
- Reduced lost time for sickness/illness
- More pleasant work atmosphere
BENEFITS - Quality

- Dust buildup creates irregular work surfaces
- Dust buildup creates bad joints
- Products leave your plant covered with dust – perceived quality by customers
BENEFITS - Maintenance

- Dust buildup interferes with machine parts movement
- Dust buildup clogs motor cooling
BENEFITS - Productivity

- Time – Do your workers stop to clean work area before beginning a job?
- Time – Do they stop to clean during a job?
- Time – Do you have shut downs or scheduled times for cleaning?
- Time – Do dusty parts from last operation need cleaning before next operation?
- Cost – 30 min/wk/employee at $25/hour is $625/employee/year (50 weeks/yr)
Current OSHA Activities

OSHA Dust Inspection Training PowerPoint Available to Anyone Who Wants It.
NEP (National Emphasis Program)

“The [NEP] applies to 64 industries (SICs / NAICs), including wood products, ...”

“Each area office is required to conduct at least four inspections per year.”

“Since the inception of the NEP [October 2007 through June 2009], more than 1000 inspections have been conducted, ...”
ANPR (Advance Notice of Proposed Rulemaking)

“OSHA plans to use the information received in response to this notice in developing a proposed standard for combustible dust.”
Allergies and Carcinogens

The link between wood dust and cancer, though not reliably confirmed, is nonetheless being used as a basis for regulation.
Dust Collection Types

- Portable
- Ducted
- Ambient
Portable Dust Collectors

Task Oriented
$150 -
Portable Dust Collectors

Task Oriented
$7,000 +
Ducted Dust Collectors

Room or Building Oriented Collector + Ducting Costs
Ducted Dust Collectors

Room or Building Oriented Collector + Ducting Costs
$2,000 - $200,000 Variety/Flexibility
Ducted Dust Collectors

Settling Chambers
Ducted Dust Collectors

Baffled Settling Chambers
Ducted Dust Collectors

Single Cyclone Separator
Ducted Dust Collectors

Multiple Cyclone Separator
Ducted Dust Collectors

Secondary Air Flow Separator

Cleaned air is vented through the end of the collector during this process.

HORIZONTAL “S” SERIES DUST COLLECTOR
Ducted Dust Collectors

Baghouse (Filters)
- With or Without Mechanical Shaker
- Reverse Jet
Ducted Dust Collectors

Electrostatic
Ambient Dust Collectors

Task or Room Oriented
Fine Airborne Dust
$200 - $10,000
Technology

• Filtration
  – HEPA (High Efficiency Particulate Air)
    • 3 micron filtration or better
      – OSHA Air Quality Standard is 5 milligrams/cubic meter, but they are considering 1
    • Optional Ultra-Violet light for airborne pathogens
    • Good for reducing allergens in the air
    • FINAL STAGE FILTERING
Technology

• Filtration
  – Bag Filter
    • High Efficiency
    • Cost Effective
    • Easy to Operate and Maintain
    • Must Be Cleaned Regularly
    • Occupies Significant Shop Space
    • Rapidly Giving Way to Cartridges
Technology

- Filtration
  - Cartridge Filter
    - High Efficiency
    - Cost Effective
    - Easy to Operate and Maintain
    - Must Be Cleaned Regularly
    - Less Shop Space Than Bags
Technology

• Ducting
  – Plastic Flexible Duct
    • Obvious Advantages At the Work Station
    • Should Not Be Used As Primary Shop-Wide Ducting
Technology

• Ducting
  – PVC
    • DON'T USE IT.
    • Fire and Explosion Hazards
    • Can't be properly grounded
    • Joints collect dust deposits
    • It Burns and gives off toxic fumes
Technology

• Ducting
  – Metal Ductwork
    • Use ONLY ductwork designed for dust collection
      – Easily grounded
      – Designed for high internal vacuum
      – Designed for clean joints to minimize buildup
Technology

- **Manual Gates**
  - Install at each machine
  - Opened by operator before starting machine
  - Can Be Wired To Start The Collector Motor
  - Reduces size/cost of dust collector
Technology

• **Electronic Gates**
  – Install at each machine
  – Opens Automatically when machine starts
  – Reduces size/cost of dust collector
Technology

• **Diverters**
  – Control Large Areas
  – Manual or Computer Controlled
  – Minimize Dust Collector Size and Cost
Technology

- Demand Sensors
  - Single Machine Control
  - 2 machines or 2 dozen machines
  - Minimize Dust Collector Size and Cost
PLC Controllers

- Cost Effective only for large operations
- Automated or manual control of every machine, work area, room, or building
- Optimum method to control cost and size of large dust collection systems
Installation/Use Tips!
Installation/Use Tips!

Dust Control

- Minimize the escape of dust from process equipment or ventilation systems
Installation/Use Tips!

Dust Control

• Use dust collection systems and filters
Installation/Use Tips!

Dust Control

• Clean dust residues at regular intervals
Installation/Use Tips!

Dust Control

• Use cleaning methods that do not generate dust clouds

Do not use compressed air or other compressed gases
Installation/Use Tips!

Dust Control

• Only use vacuum cleaners designed and approved for dust collection
Installation/Use Tips!

• Properly Size Your System (4,500 fpm)
• Use Metal Ducting
• Ground Everything
**Installation/Use Tips!**

- Use Explosion Venting or Suppression Systems
- Collection Bins Outside or Enclosed (20 ft separation)
- Regularly Clean The Ducts Of Deposited Dust
- Documentation!
References
Miscellaneous Useful Web Sites, Part 1

- http://www.frisbiefilter.com/baghssw.htm
  - The focus of this site is baghouses, and the site seeks to sell its software for the sizing and maintenance of dust collection systems.

- http://www.dustcollectorexperts.com/
  - A central clearinghouse for dust collector information. Numerous articles covering the various types and components of dust collection. List of and links to many manufacturer sites. If you have a large or complex requirement, you should at least visit this site.

- http://store.oneida-air.com/ductdesign.aspx
  - Oneida is best known for its line of cyclonic dust collectors. This page of their site assists in designing and sizing your ductwork. Oneida will also design it for you if you order from them.
References
Miscellaneous Useful Web Sites, Part 2

  - Intended for small to medium shop systems, the Jet Tool site offers useful data for sizing your ducts and airflow.

- [http://www.pennstateind.com/duct_assist.html](http://www.pennstateind.com/duct_assist.html)
  - Penn State Industries' duct sizing site. Useful for the small to medium shop.

  - Nordfab's line of ducting is presented here. Free design service is offered along with their products.

  - Offers the Donaldson Torit® line of ductwork. Torit® also offers other components for dust collection.
References
OSHA Web Site

• http://www.osha.gov/dts/shib/shib073105.html
  “Combustible Dust in Industry: Preventing and Mitigating the Effects of Fire and Explosions”, Safety Health and Information Bulletin (SHIB), 07-31-2005 (References at the end are useful for those interested in the science of explosions.)

• http://www.osha.gov/dep/combustible_dust/combustible_dust_nep_rpt_102009.html
  “STATUS REPORT on COMBUSTIBLE DUST NATIONAL EMPHASIS PROGRAM,” October 2009.

  News Release, “US Labor Department's OSHA addresses need for combustible dust standard, Advance Notice of Proposed Rulemaking solicits comments from public”, October 20, 2009

  Advance Notice of Proposed Rulemaking (ANPR), Federal Register: October 21, 2009 (Volume 74, Number 202)

• http://www.osha.gov/Publications/3371combustible-dust.html
  OSHA's Guidance Document on combustible dust fire and explosion hazards

• http://www.osha.gov/dts/chemicalsampling/data/CH_276185.html
  Wood Dust Toxicity and Acceptable Exposure Limits Are Given
References
Publications


• “Wood Dust Hazards Handbook,” National Fire Protection Association (NFPA). [can be found on Amazon.com for about $50]


• “Uniform Fire Code,” NFPA. $77.50 at www.nfpa.org


