HEALTHY AIR
A COMMUNITY AND BUSINESS LEADERS GUIDE

Reducing Air Pollution from: Wood Furniture Operations

Why should my wood furniture operation reduce air pollution?

People who are exposed to toxic air pollutants at sufficient concentrations, for sufficient durations, may increase their chances of getting cancer or experiencing other serious health effects, such as reproductive problems, birth defects, and aggravated asthma.

Pollution prevention safeguards the health of your employees, customers, and families by using materials, processes, or practices that can reduce or eliminate air pollution at the source. For example, covering containers of cleaning solvents prevents vapors from affecting your employees.

Pollution prevention practices also save money on waste disposal, materials usage, and the cost of air pollution controls.

You may already be regulated by federal, state, local, or Tribal agencies and may already voluntarily implement pollution prevention practices. However, increasing pollution prevention efforts can further minimize impacts on human health and the environment.

Why should I be concerned about air pollution from my wood furniture operation?

- Wood furniture operations can produce emissions of toxic air pollutants.
- Finishes, stains, and topcoats applied during the finishing process can release some toxic air pollutants and volatile organic compounds (VOC). Chemicals in these substances can react in the air to form ground-level ozone (smog), which has been linked to a number of respiratory effects.
- Other sources of toxic emissions include adhesives used for gluing and solvents used during cleanup. Stripping processes during refinishing can also emit air pollution.
- While federal, state, local, and Tribal regulations limit the amount of emissions from wood furniture operations, dangerous releases of toxic air pollutants can occur if a wood furniture operation is not in compliance with regulations.

How can I reduce air pollution from my wood furniture operation?

Substitute Materials

- Use alternative adhesive systems or formulations such as hot melts, hot seal, aqueous-based, or polyvinyl acetate.
- Switch to less toxic coating types such as high-solids nitrocellulose, aqueous-based, ultraviolet (UV) cured, or polyester/polyurethane.
- Use aqueous-based cleaners which have lower toxic air pollutant and VOC content.
- Use alternative stripping materials that contain N-methyl pyrrolidone or gamma-butyrolactone. These are water-soluble, biodegradable solvents.

Using fully enclosed spray gun washers reduces solvent evaporation by approximately 50%.

— Office of Pollution Prevention, Ohio Environmental Protection Agency

Could your family be affected?

One furniture manufacturer installed a 7-gallon solvent recovery unit for $4,500. By running it 2 times a day, it recovered 5 gallons of reusable solvent for every 7 gallons of cleanup waste. Waste reduction was 1,900 pounds per year, and cost savings were $3,200 a year.

— University of Wisconsin Solid and Hazardous Waste Education Center

- Instead of solvents, use heat to adjust viscosity of the coating. This reduces the amount of solvent used.

Increase Application Efficiency

- Use more efficient paint application equipment to reduce overspray such as switching to a high-volume, low-pressure spray (HVLP), airless spray, air-assisted airless spray, or electrostatic spray guns.
- Train painters in proper spray application techniques. Proper training, which includes information on gun position, motion, triggering, and overlap, can reduce air pollutant emissions and enhance the quality of the paint finish.
- Use a coating method that does not require spraying such as vacuum coating, dip coating, roll coating, flow coating, dry coating, and curtain coating.

Lower Emissions at the Source

- Cover all containers securely to reduce the chance of spills when transferring materials.
- Use funnels or pumps to avoid spills when dispensing materials.
- Keep glue containers covered to reduce toxic vapors.
- Minimize evaporative emissions by using enclosed or mechanical parts washing and gun washing systems.
- Store rags and towels in a closed container.

Change Cleaning Procedures

- Use mechanical cleaning such as scraping or wiping before using solvents.
- Minimize solvent use by cleaning spray guns in a gun washer.
- Use water-based detergents or acetone in place of more toxic cleaning solutions.
- To reduce the frequency of cleaning equipment, arrange light-color to dark-color batch sequencing
- Schedule production runs to minimize the number of color changes.

Recycle Materials

- Reuse cleaning solution or solvent. Use dirty solvent for initial cleaning, then follow with clean solvent.
- Use an on-site distillation unit to clean dirty cleaning liquid. This makes the solvent available for reuse in the production process. On-site distillation reduces both the cost of solvent disposal and fresh solvent purchase.
- Recover solvents for reuse.
- Collect and reuse any staining operations overspray.

Upgrade Your Operation's Equipment

- Check with your state, local, or Tribal pollution prevention office for funding possibilities.

Are HVLP spray guns really better? Where can I find out about training?

HVLP guns are better if technicians are trained properly. Toxic air pollutant emissions released during a painting operation are directly related to the skill of the spray gun operator.

Properly used, HVLP spray guns often result in a higher transfer efficiency, which results in reduced overspray.

Reduced overspray reduces costs and worker exposure to toxic emissions.

Information about training may be found at

- Iowa Waste Reduction Center: *www.iwrc.org/programs/STAR.cfm* or call (800) 422-3109
- Local or state pollution prevention offices
- Spray equipment suppliers

What else can I do to reduce air pollution?

Your community may already have groups working for cleaner air. Your expertise and knowledge can be very helpful to these groups.

Many pollution prevention offices offer free on-site assessments for interested businesses. A list of these small business assistance programs can be found at *www.epa.gov/smallbusiness*. This site provides information about assistance and technical help, environmental experts, environmental regulations and laws, funding, and cost-saving opportunities.

Sponsor employee awards for good ideas, great efforts, and dedication to pollution prevention. For example, you could provide a cash award for workers who implement a work practice that reduces both costs and pollution.

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Could your family be affected?

One furniture manufacturer replaced all air spray guns with HVLP guns and reduced the amount of coating needed to spray production parts by 39%.

HVLP gun cost: $8,125.
Payback period: 3 weeks.
Reason: Decreased coating purchases.

— Pollution

Resources

- American Home Furnishings Alliance: www.*afma4u.org*, (336) 884-5000
- EPA Air Toxics Web Site: *www.epa.gov/ttn/atw/*
- Community-Based Projects: www.epa.gov/air/toxicair/community.html
- National Emission Standards for Hazardous Air Pollutants: Wood Furniture Manufacturing Operations: *www.epa.gov/ttn/atw/wood/riwood.html*
- Wood Furniture and Fixtures Industry Sector Notebook: *www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/wdfurnsn.pdf*
- Paint and Coatings Resource Center: *www.paintcenter.org*
- University of Wisconsin Solid and Hazardous Waste Education Center: *www.uwex.edu/ces/ag/sus/wood/pdfindex/*
- Pollution Prevention: *www.pprc.org/pubs/factsheets/laund7.html*

Alternatives

- Solvent Alternatives Guide: *www.sage.rti.org*
- The Coatings Guide™: *www.cage.rti.org*

Toxicity of Solvents

- Integrated Risk Information Systems (IRIS): *www.epa.gov/iris*
- Air Toxics Health Effects Notebooks: *www.epa.gov/ttn/hapindex.html*

Ohio EPA's Office of Pollution Prevention has published "Woodworking and Refinishing Pollution Prevention Opportunities," which provides examples of how to calculate cost savings and environmental benefits. Any company can insert their material usage numbers and calculate potential cost savings and environmental benefits.

— Office of Pollution Prevention, Ohio Environmental Protection Agency