Draft Ventilation Guidance for Spray Polyurethane Foam Application

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- Partnership with:
  - The Occupational Safety and Health Administration (OSHA)
  - The National Institute for Occupational Safety and Health (NIOSH)
  - The Consumer Product Safety Commission (CPSC)
  - The Agency for Toxic Substances and Disease Registry (ATSDR)

- Working with industry and other stakeholders to:
  - Improve availability of accurate/comprehensive hazard information
  - Develop and communicate best practices to prevent exposures
  - Address the use of inaccurate or misleading marketing claims
  - Address exposure assessment data and research gaps
What are the Health Risks with SPF Application

- Sensitization and asthma, a potentially life-threatening disease
- Respiratory problems and other breathing difficulties
- Skin and eye irritation
- Other potential adverse health effects
Why is Ventilation Important

- **Airborne contaminants are generated during the application process**
  - Vapors and mists generated during spraying
  - Dusts/particulates generated during trimming/cutting/grinding
  - Vapors also emitted during curing

- **Workers and others in the area can breath airborne contaminants or get them on the skin/eyes**

- **Properly designed ventilation can help reduce airborne contaminants**
  - Poorly designed ventilation could make matters worse
Fundamentals of Ventilation

**Two Basic Types of Ventilation**

**General exhaust ventilation**
- Inside air is removed from the room or area and replaced with outside air
- Commonly referred to as dilution ventilation

**Local exhaust ventilation**
- Exhaust hood is located at the source of contamination to capture contaminant before it can mix with air in the rest of the room
- Recommended for controlling hazardous airborne contaminants
SPF Ventilation Challenges

- Each work site is different
- Point of application (the source of airborne contaminants) is constantly moving
- One size fits all approach will not work
- Need to understand principles of ventilation to ensure effective design
- The draft fact sheet focuses on key principles to enable applicators
Basic Ventilation Design Principles

Key Components of a Ventilation System

- Work space to be ventilated
- Exhaust system
- Make up air

Understanding how these components work together is a key to effective design
Establish Air Flow Across Spraying Area

Key Principles
- Flow across the entire work space
- Draw contaminants away from workers

Related Tips
- Avoid improper fan placement
- Place exhaust hood as close to application point as possible
Establish air flow across the spraying area and draw overspray away from workers
Establish an Enclosure to Isolate Contaminants

Key Principles

- Prevents migration of contaminants to other areas
- Minimizes the size of the area to be exhausted

Related Tips

- Establish a negative pressure in the area
- Avoid short circuits
- Seal off building HVAC openings
Poor design of entryway short circuits ventilation and creates dead space

- Air Exhaust Fan
  *Located in window or door*

- Spray Zone
  *SPF Sprayer*

- Make-up Air Inlet
  *(Window or other opening)*

- Enclosure Opening

- Air Supply

- Temporary Wall
  *Isolates (encloses) spray zone*

- Dead Space
Direct Exhaust to a Safe Location

Key Principles

- Exhaust outdoors away from people
- Establish a control zone to keep people out
- Watch out for building make up air intakes

Related Tips

- Install particulate filters
  - Removes particulate from exhausted air
  - Protects fan

Fan may need to be explosion proof...check with SPF manufacturer
Ensure Adequate Ventilation After Application

- Check with the manufacture to determine safe re-entry times
- Minimize worker re-entry during this time
- Ensure that those entering have proper protective equipment
- Restrict occupant re-entry until the building has been fully ventilated and cleaned
- Inform building owners/occupants and other trades about potential exposure hazards prior to safe re-entry times
Ventilation Challenges Post-Application/Re-occupancy

- Minimize the potential for long-term odor issues
  - Proper mixing ratios, curing conditions, and ventilation
  - Consider long-term air exchange and ventilation needs
  - Inform building owners/occupants about what to expect upon re-entry, potential sources etc.
- “Green Job” beyond one-time SPFI installation job
  - Continuum to include services for long-term HVAC/IAQ/IH implications/needs
  - Broader certification/inspection needs
  - ENERGY STAR® Residential Insulation Partnership Enhancements
Where to Get More Information

- Spray Polyurethane Foam Alliance’s website at http://www.sprayfoam.org/
- ‘Seal and Insulate with ENERGY STAR® Program’ at http://www.energystar.gov/index.cfm?c=manuf_res_pt_insulation
Questions?