

## Preventing Asthma and Death from MDI\* Exposure During Spray-on Truck Bed Liner and Related Applications

### WARNING!

Workers exposed to MDI\* may develop serious or fatal respiratory disease.

**W**orkers should take the following steps to protect themselves from MDI\* exposure during spray-on applications:

#### 1. Be informed.

- Participate in medical exams, medical monitoring, air monitoring, respiratory fit-testing, and training programs offered by your employer.
- Know the safety and health information and follow all safety precautions provided by the manufacturers about the product(s) you are spraying.

#### 2. Use respirators and PPE safely.

- Make sure that you have been fit-tested for your respirators and that you have been trained in their proper use, storage, and maintenance.
- Regularly inspect and maintain all component parts of supplied-air respirators and air-purifying respirators to assure their continued effectiveness. The components include air compressors, hoses, regulators, facepiece, etc.

- When spraying MDI,
  - always use a full-facepiece, supplied-air respirator operated in a pressure-demand or other positive-pressure mode and
  - wear appropriate personal protective equipment (PPE) (such as hooded coveralls, chemical-resistant gloves, and footwear).
- Never remove or lift the respirator away from the face while in the spray enclosure. Use clear plastic tear-away sheets on the visor to provide better visibility throughout the spray process.
- Be aware that the highest MDI concentrations occur inside the spray enclosure.
- After spraying, leave the spray enclosure before removing your respirator and PPE and keep the ventilation system running to exhaust any remaining MDI.
- Do not re-enter the spray enclosure after spraying has stopped without PPE and a respirator (minimum protection is an air-purifying respirator with a full facepiece equipped with a combination organic vapor/N95 filter cartridge).
- Know the change-out schedule for the air-purifying respirator cartridge and strictly follow the schedule to make sure that you are adequately protected from exposure to MDI.

\*MDI is methylenebis(phenyl isocyanate). In this fact sheet, MDI refers to all MDI-based isocyanates.

### 3. Check the ventilation system in the spray enclosure.

- Make sure that the spray enclosure ventilation is operating correctly before beginning the spray process.
- Ensure ventilation system intake filters are not clogged and are correctly installed in their frames.
- Keep the ventilation system running until the MDI aerosol has been cleared from the spray enclosure.

### 4. Use good work practices and personal hygiene.

- Never eat or drink in work areas.
- Wash hands and face before eating, drinking, or smoking.

### 5. Report symptoms.

- Do the following if you have symptoms:
  - Tell your employer if you develop breathing problems that could be related to MDI exposure (wheezing, chest tightness, shortness of breath, or coughing).
  - Seek medical evaluation of those symptoms.
  - Do not spray or remain exposed to MDI until you are medically evaluated for breathing problems that might be related to the spraying process.
- If you have been diagnosed with occupational asthma due to sensitization from MDI, do not work where you might be exposed to MDI.



Spraying base coat with protective equipment.

For additional information, see ***NIOSH Alert: Preventing Asthma and Death from MDI Exposure During Spray-on Truck Bed Liner and Related Applications*** [DHHS (NIOSH) Publication No. 2006-149]. Single copies of the Alert are available from the following:

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Cincinnati, OH 45226-1998

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**DEPARTMENT OF HEALTH AND HUMAN SERVICES**  
Centers for Disease Control and Prevention  
National Institute for Occupational Safety and Health

**NIOSH**

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### WARNING!

Workers exposed to MDI\* may develop serious or fatal respiratory disease.

**E**mployers should take the following steps to protect workers from MDI exposure during spray-on applications:

- 1. Provide workers who may be exposed to MDI with information and training about MDI as required by the OSHA hazard communication standard [29 CFR<sup>†</sup> 1910.1200].**
  - Inform workers about the serious health effects that may result from exposure to MDI and provide them with safety and health information.
  - Inform workers about any materials that may contain or be contaminated with MDI.
- 2. Provide respiratory protection and personal protective equipment to workers who may be exposed to MDI.**
  - Develop, implement, and enforce a worksite-specific respiratory protection program that provides for medical monitoring, medical examinations, respirator fit-testing, and respirator training.

- Provide appropriate PPE (hooded coveralls, chemical-resistant gloves, and footwear) to workers who use spray guns and to other workers who may be exposed to MDI.
- Train workers to properly use, store, and maintain their respirators.
- Regularly inspect and maintain all component parts of supplied-air and air-purifying respirators to assure their continued effectiveness. The components include air compressors, hoses, regulators, facepieces, etc.
- Make sure respirators are professionally fitted.
- When workers must wear prescription eye glasses under a full-facepiece respirator, provide them with prescription inserts designed to be compatible with the respirator.

### **Supplied-air respirators**

- When workers are spraying MDI or are inside the spray enclosure during spraying, make sure they use full-facepiece, supplied-air respirators operated in a pressure-demand or other positive-pressure mode.
- Make sure that supply air for the supplied-air respirator is taken from a clean, uncontaminated area that is well removed from any aerosolized MDI or other contaminants.

<sup>†</sup>Code of Federal Regulations.

### **Air-purifying respirators**

- When workers must enter or re-enter the spray enclosure after spraying, make sure they use full-facepiece, air-purifying respirators equipped with a combination organic vapor/N95 filter cartridge. This is minimum acceptable protection for these conditions.
- Establish and implement a change-out schedule for air-purifying respirator cartridges.

### **3. Provide engineering controls.**

- Build a spray enclosure equipped with an exhaust ventilation system to
  - isolate the spray process from the rest of the facility and
  - maintain the enclosure under negative pressure to control and contain MDI aerosols in the spray enclosure.
- Determine the number of air changes per hour provided by the ventilation system and use this information to calculate the time required (after spraying) to reduce airborne MDI concentrations below the NIOSH recommended exposure limit (REL).
- Make sure that workers are trained to use engineering controls (such as spray enclosures with effective ventilation) and work practices to minimize MDI exposures.
- Allow only trained workers wearing NIOSH-approved, full-facepiece, supplied-air respirators to enter the spray enclosure during spraying.
- Establish and implement a preventive maintenance program for the ventilation system.

### **4. Provide medical examinations and surveillance for workers potentially exposed to MDI.**

- Provide a preplacement medical examination and periodic medical monitoring for all potentially exposed workers to detect and prevent the acute and chronic effects of MDI exposure.

- Remove from the workplace any worker showing signs or symptoms of MDI exposure.
- Make sure the worker is medically evaluated before he or she is allowed to return to work.
- If the medical evaluation determines that the worker is sensitized, the worker must not be allowed to return to a job where MDI is used.



Truck in bed liner spray enclosure.

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