



Hazard Alert

Topic Summary:

Spray-on urethane truck bed linings and isocyanate exposures

Spray-on Truck Bed Lining Employer:

Please take time to read important information that will help you protect your shop and office workers from isocyanate over-exposure. Isocyanates are very toxic and can cause immediate and long-term health problems including permanent breathing or chest problems.

Summary

Recent workplace safety and health inspections have found workers exposed to isocyanates while spraying on truck bed lining. Workers' compensation claims for asthma related to spray-on truck bed liners have resulted. This alert provides information to you – the employer – and your employees on the hazards and the need for effective control of the hazards. Due to the seriousness of the hazard, the Department of Labor and Industries, WISHA Services, is focusing enforcement in companies that apply spray-on bed linings. Companies may be fined for violations of WISHA workplace safety rules.

How are isocyanates used?

Isocyanates are a group of very reactive and toxic compounds used to make urethane, polyurethane or polyurea coatings. Spray-on truck bed liners, automotive paints and rigid foams are examples of materials that are based on isocyanates.

Protective linings are applied to truck beds using a spray application process. All spray-on truck bed lining involves mixing two-part urethane components and spraying the polymerizing urethane onto a cleaned and scuffed truck bed.

Why should I be concerned about isocyanates?

Workers applying this material can be exposed to very high levels of these toxic compounds. Office workers, sales staff, managers and others workers can be exposed to lower but harmful levels of isocyanates if the spray operation is not well controlled.

The following health effects may occur **immediately or shortly** after exposure to isocyanates or mixtures containing isocyanates:

- Allergic sensitization – a person becomes allergic, this could appear as wheezing, shortness of breath or coughing
- Irritation of the eyes and lungs
- Upset stomach, vomiting
- Possibly fevers
- Stuffiness of the nose
- Sore throat
- A feeling of tightness in the chest

These symptoms may be delayed up to eight hours after the person has been exposed.

The following **long-term** health effects may occur at some time after exposure to isocyanates or mixtures containing isocyanates and can last for months or years:

- Permanent breathing or chest problems, including asthma, even when no longer exposed.
- Increased sensitivity. Severe asthma attacks could result if a person is exposed again – even at concentrations below the established limits. Once sensitized to isocyanates a person should not be exposed to any concentration and should not be allowed to work where he or she may be exposed further.
- Repeated or prolonged exposure of the skin to isocyanates may cause a skin rash and cause an allergic skin reaction.

If Symptoms Develop

If workers develop any lung symptoms consistent with isocyanate exposures, they should stop any spraying until a physician has cleared them. Continued exposure can lead to permanent lung damage.

How do I protect my workers and myself?

Exposure Assessments

If you use isocyanates or products containing isocyanates, you must determine the potential for worker exposure. In most spray-on bed lining operations, reactive isocyanates will become airborne. Depending on the bed liner product and efforts at control, isocyanates may be present above the permissible exposure levels (PEL). You may obtain consultation services from WISHA Services to measure isocyanate exposure.

Engineering Control and Ventilation

You must install feasible work area controls to reduce harmful exposures to isocyanates.

- Exhaust ventilation systems and spray areas must be designed to capture and contain vapors and particulates to reduce exposure to the sprayer.
- Drive-in vehicle spray booths are commercially available and work well when properly used.
- An industrial ventilation engineer or a reference such as the American Conference of Governmental Industrial Hygienists (ACGIH) ventilation manual should be used when creating a custom made spray booth.
- Other engineering controls may be pursued, such as changes in equipment or process that reduce the vapors and particulates.
- Filters for ventilation equipment should be changed before becoming so clogged they interfere with the ventilation.
- Ventilation equipment should be checked for adequate performance at least every three months.

If anyone working around the operation develops lung conditions consistent with isocyanate exposure, the control methods need to be re-evaluated.

Work Practices

Worker position during spraying is very important. If a worker gets between the exhaust ventilation and where the product is being applied, the ventilation system will draw the air contaminants toward the worker, increasing exposure. Employers should train workers not to place themselves between the exhaust and where they are applying the lining. Some application techniques can generate more aerosols than others; use techniques that keep aerosols to a minimum.

Restricted Areas

Areas containing isocyanates should be restricted to properly trained and protected workers. All other workers should stay away from the work area where these products are being applied.

Protective Clothing and Equipment

When there is potential for skin or eye contact with isocyanate compounds, workers should be provided with and required to use appropriate personal protective clothing and equipment to prevent contact. Depending on the task, protective wear includes coveralls, head cover, footwear, chemical-resistant gloves and eye protection, including goggles or full face-shield.

Respiratory Protection

When engineering controls are being instituted or if well-designed and maintained controls do not adequately reduce exposures, respiratory protection **must** be used. Usually, a full-face supplied air respirator will be used when working with isocyanates. However, air-purifying respirators may be used provided they are used with a combination organic vapor cartridge equipped with a P-100 filter and a cartridge change out schedule to ensure that the cartridge remains effective. Respirators are often used to supplement engineering controls.

Any respirator use must, at a minimum, meet the requirements of the WISHA respiratory protection standard [WAC 296-62, Part E].

Wash Up Immediately After Exposure

Thoroughly and immediately wash any skin exposure to isocyanates to help prevent skin irritation, and allergic skin reactions.

Worker and Employer Education

Worker education is vital to a good occupational safety and health program. WISHA workplace safety rules require that workers be informed about:

- Operations or work areas where these chemicals are used.
- The location of the hazard communication program including lists of chemicals and the Material Safety Data Sheets (MSDS).

WISHA workplace safety rules require that employees be trained on the following:

- Methods or observations that can indicate the presence or release of diisocyanates in the work area.
- The physical and health hazards of the isocyanates, including the likely symptoms from exposure.
- The ways employees can protect themselves from these hazards, including specific steps you, the employer, has taken such as engineering controls, work practices, emergency procedures and personal protective equipment.
- Details of your company's hazard communication program, including explanations of the labeling system, MSDS, and how workers can get and use this information.

Other Hazards

The MSDS lists other hazards associated with the product. Pay attention to the physical properties such as flammability or corrosiveness. Look into the health warnings for what to do in an emergency; they provide useful information on the precautions you must take to protect your workers and yourself. Some systems use high pressures and temperatures that may create hazardous conditions.

How Can I Get Help from L&I?

L&I also offers a no-fee consultation service that is separate from compliance. WISHA consultants will come to your workplace and evaluate your compliance with WISHA workplace safety rules. If the consultant finds a serious hazard, you must correct it, but the consultant will not fine you. To arrange a consultation, call

a regional office listed below and ask for the WISHA consultation supervisor. You may also call 1-800-4-BE-SAFE to speak with central office staff.

Region	Counties	Telephone Number
1	Island, San Juan, Skagit, Snohomish, Whatcom	425-290-1300
2	King	206-515-2800
3	Clallam, Jefferson, Kitsap, Pierce	253-596-3800
4	Clark, Cowlitz, Grays Harbor, Klickitat, Lewis, Mason, Pacific, Thurston, Wahkiakum	360-902-5799
5	Adams, Benton, Chelan, Columbia, Douglas, Franklin, Grant, Kittitas, Okanogan, Walla Walla, Yakima	509-454-3700 Toll-free 1-800-354-5423
6	Southeast Adams, Asotin, Ferry, Garfield, Lincoln, Stevens, Pend Oreille, Spokane, Whitman	509-324-2600 Toll-free: 1-800-509-8847

Information Available on the Web

WISHA Rules

Core Rules: www.LNI.wa.gov/wisha/rules/corerules/default.htm

Hazard Communication: www.LNI.wa.gov/wisha/rules/corerules/HTML/296-800-170.htm

Respiratory Protection: www.LNI.wa.gov/WISHA/Rules/generaloccupationalhealth/HTML/62E_1.htm

Air Contaminants: www.LNI.wa.gov/WISHA/Rules/generaloccupationalhealth/HTML/62H_1.htm

Other rules may apply.

NIOSH Hazard Alert: "Preventing Asthma and Death from Diisocyanate Exposures," National Institute for Occupational Safety and Health (NIOSH), <http://www.cdc.gov/niosh/asthma.html>

Occupational Safety and Health Administration (OSHA)

General information: <http://www.osha.gov/>

Isocyanate-specific information: <http://www.osha.gov/SLTC/isocyanates/index.html>