

Isocyanates

OAR 437
Division 2
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*Isocyanates***What are Isocyanates?**

Isocyanates are used to make polyurethane, a synthetic material that has many commercial and industrial uses. The most common forms of isocyanates are toluene diisocyanate (TDI) methylene diphenyl diisocyanate (MDI), and hexamethylene diisocyanate (HDI).

What are the hazards?

Isocyanates are extremely hazardous. You're exposed when you breathe the vapors or get the chemicals on your skin (that's right – your skin will absorb the stuff like a sponge). And isocyanates don't have a distinctive odor, so you can't use your sense of smell to protect you.

Isocyanates can irritate your eyes, throat, nose, and skin, and cause many respiratory illnesses such as bronchitis, emphysema, and asthma. If you have pre-existing breathing problems, exposure to isocyanates can make them worse. Other exposure symptoms include coughing, tightness of the chest, shortness of breath, nausea, vomiting, stomach pain, and even loss of consciousness.

You can become sensitized to isocyanates and have allergic reactions even if you're exposed at very low levels or for a short time. Long-term exposure can lead to a condition called "isocyanate asthma."

**What products contain isocyanates?**

Many products made with polyurethane contain isocyanates, such as:

- adhesives, coatings, and paints
- automobile bumpers
- coated fabrics
- pesticides
- rigid foam and insulation
- soft foam in car seats, furniture, and mattresses
- spandex fibers
- truck bed liners

How can you be exposed?

You may be exposed if your job involves:

- applying building insulation materials
- burning polyurethane material
- foam-blowing
- installing truck bed liners
- manufacturing pesticides
- painting or repairing vehicles and boats
- working in confined spaces with polyurethane products
- working with polyurethane raw materials and hot products

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How can you protect yourself?

- Know that enclosed work areas can contain high concentrations of isocyanates.
- Use personal protective equipment, including proper gloves, goggles, full-face shields, and respirators.
- Wash your hands and face before eating, drinking, or smoking outside your work area.
- Shower and change into clean clothes before leaving your workplace.
- Make sure that your employer has an air-monitoring program and material safety data sheets (MSDS) for products that contain isocyanates.

What can your employer do to protect you?

- ✓ **Use engineering controls.** Engineering controls are the best way to protect you because they can eliminate your exposure risk. An exhaust ventilation system that removes isocyanate vapors from the air is an example. A control booth in a specially ventilated room is another example.
- ✓ **Use another product.** Can your employer replace isocyanates with chemicals that aren't as hazardous?
- ✓ **Limit access.** Restrict areas where isocyanates are used to essential workers.
- ✓ **Provide proper protective gear.** Workers who are exposed need to use personal protective equipment, which may include coveralls, footwear, chemical-resistant gloves and goggles, full-face shields, and respirators.

If you use a respirator: A supplied air respirator gives the highest level of protection. Full face and half mask respirators with organic vapor cartridges and prefilters may be acceptable in some circumstances – but only if they are correctly used and maintained. Before you use these respirators, your employer must set up a respiratory protection program that meets the requirements of our respiratory protection rule – 1910.134.

If you use gloves: Refer to your MSDS on products that contain isocyanates to determine the proper gloves. Latex gloves won't protect you.

- ✓ **Train and educate.** Your employer must tell you about the health effects that may result from exposure to isocyanates through a hazard communication program.
- ✓ **Conduct air monitoring.** If you use materials that contain isocyanates, your employer should measure your exposure to determine if you are overexposed.
- ✓ **Conduct medical monitoring.** A medical monitoring program, which involves a physician, can detect and prevent long-term effects of exposure.
- ✓ **Request a consultation** on best practices for controlling isocyanate exposures from your workers' compensation insurer or Oregon OSHA.

What are the rules?

These general industry rules apply (similar rules may apply for construction and agricultural activities):

- Flammable liquids – 1910.106
- Hazard communication – 1910.1200
- Medical and first aid – 437-002-0161
- Oregon rules for air contaminants – 437-002-0382, Tables Z-1 and Z-2
- Sanitation – 1910.141
- Personal protective equipment – 437-002-0134
- Respiratory protection – 1910.134
- Spray finishing – 437-002-0107