



SEARCH

A to Z Index | En español | Contact Us | FAQs | About OSHA

OSHA

OSHA QuickTakes Newsletter RSS Feeds Print This Page Text Size Was this page helpful?

Occupational Safety & Health Administration We Can Help

What's New | Offices

Home Workers Regulations Enforcement Data & Statistics Training Publications Newsroom Small Business OSHA

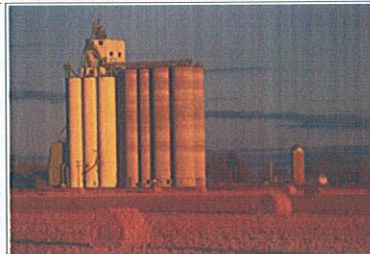


Home Tractors Machinery Struck-By Falls Electrocution Spaces Chemicals Workers Dust Other

Confined Spaces

⚠ If you are under 16, [Child Labor Laws](#) forbid you from working inside a fruit, forage, or grain storage structure designed to retain an oxygen-deficient or toxic atmosphere, an upright silo for two weeks after silage has been added, or in a manure pit. [State laws may be even more stringent.](#)

Do You Know... Confined work spaces can be very dangerous? You can be at risk of being overcome by gases when entering a confined area such as a manure pit, silo, grain bin, or other confined areas, that may not have enough ventilation. Gases that build up in manure pits and silos can quickly kill an unsuspecting worker. Workers entering grain bins while the bin is being emptied may risk being crushed or suffocated by flowing grain. Breathing moldy dusts can also cause lung damage (see [Organic Dust](#)).



Case Study Fatality: A 13-year-old boy died after being engulfed by corn inside a grain bin.

Teen Safety Solutions

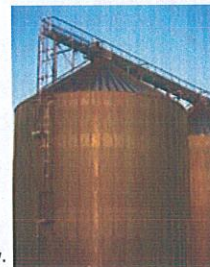
Employers have the primary responsibility for protecting the safety and health of their workers. Employees are responsible for following the safe work practices of their employers.

Confined Spaces

- **Be** aware that there is always a danger of gases or an oxygen deficiency in confined spaces and make sure you are trained to use all safety equipment.
- **Never** enter a confined space without:
 - Confirming the space has sufficient oxygen and is not an oxygen deficient atmosphere.
 - Verifying it has been ventilated.
 - Posting a second person outside the area that you can communicate with by sight, sound, or signal line.
 - Wearing a safety harness attached to a hoist.
- **Have** rescue equipment (ropes, ladders, lifts, and (SCBA) Self-Contained Breathing Apparatus, available in case someone is overcome by gas. Get training in how to safely perform a rescue.
- **If** an area cannot be ventilated, wear a correctly fitted and approved SCBA respirator.
- **Never** attempt to rescue someone who has been overcome by fumes in an area unless you have been trained and are wearing a SCBA-equipped respirator.

Grain Bins

- **Stay** out of grain bins, wagons, and grain trucks when unloading equipment is running.
- **Ensure** that if you must enter a grain bin:
 - The unloader is shut off.
 - The unloading equipment is locked out to prevent someone from starting the equipment while you are inside.
 - You have put on a safety harness and attached a lifeline to a lifting device before entering.
- **Always** wear an appropriate respirator when working in a grain bin because grain dust can cause difficulty breathing.
- **Stay** near the outer wall of the bin and keep walking if the grain should start to flow.



- **Have** at least one and preferably two people outside the bin to help if you become trapped.

Silos

- **Do not** enter a silo for four to six weeks after filling, as several different dangerous gases are produced as forages ferment. Be aware that even after six weeks it may **not** be safe to enter silos, and SCBA-equipped respirators should be worn anytime you are entering full or partially full silos.
- **Be** alert for silo gas odors or yellowish-brown or reddish fumes in or near the silo. These gases are nitrogen oxides which if inhaled, can cause severe delayed lung damage.
- **If** you must enter silos during the first four to six weeks after filling stops, or anytime the silo is full or partially full, wear a SCBA-equipped respirator. A regular respirator or dust mask will **not** protect you in an oxygen deficient atmosphere.
- **Never** enter a silo alone.
- **If** you start coughing or experience throat irritation, get away from the area immediately, inform your employer, and seek medical attention.

Manure Pits

- **Be** aware of the dangers of entering manure pits. Potentially dangerous gases remain in pits even after they have been emptied.
- **Never** enter a manure pit unless you are wearing a self-contained breathing apparatus (SCBA respirator) and a lifeline and harness and are monitored by a standby person who is equipped and trained to rescue you.
 - Secure the end of your lifeline to the mechanical lifting equipment outside the pit.
 - Mechanical lifting equipment should have a clutch that will prevent exerting excessive force on a person being retrieved.
 - The use of a harness or safety belt with a lifeline is critical because it is the only safe means for a standby person to rescue a worker from the pit without proper respiratory protection (such as a positive-pressure, SCBA).
- **Do not** try to rescue someone from a manure pit unless you have been trained and are wearing the proper equipment. Call the local fire department or rescue squad immediately. They have the training and equipment needed to accomplish such a rescue without endangering other lives.



Employer Safety Solutions

Employers have the primary responsibility for protecting the safety and health of their workers. Employees are responsible for following the safe work practices of their employers.

Follow the **Fair Labor Standards Act (FLSA)** including:

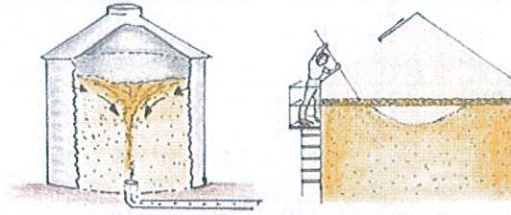
- ⊘ Some agricultural jobs are too dangerous for anyone under 16 to perform. No youth under 16 years of age may be employed at any time in any of these **Hazardous Occupations in Agriculture (HO/A)**; including working inside:
 - **(HO/A #8).** (a) A fruit, forage, (feed), or grain storage structure designed to retain an oxygen deficient or toxic atmosphere - for example, a silo where fruit is left to ferment; (b) An upright silo within two weeks after silage (fodder) has been added or when a top unloading device is in an operating position; (c) A manure pit; or, (d) A horizontal silo while operating a tractor for packing purposes.

Consider implementing recommended safe work practices, including:

- **Develop** a "safety first" attitude. Follow safe work practices all the time and set a good example for others.
- **Develop** a confined space safety program that identifies how to safely enter confined spaces. For information on a confined space safety program see:
 - [Confined Spaces: OSHA Safety and Health Topics page.](#)
 - [Confined Spaces Advisor 1.1](#)
- **Provide** adequate training for all workers about the dangers of confined spaces, grain bins, silos and manure pits.
- **Ensure** that all workers are trained in rescue procedures.

Confined Spaces

- **Make** sure that all confined spaces are ventilated before workers enter them.
- **Test** the atmosphere for potentially hazardous gases.
- **Train** workers to use SCBA-equipped respirators and make sure they are correctly fitted to the worker.
- **Set up** safety protocols to ensure that at least two workers are available to assist someone entering a confined space in case a rescue is needed.
- **Supply** ladders, ropes, safety harnesses, and lifelines in areas where workers may be overcome by gases or vapors or in oxygen deficient atmospheres.



When grain is being emptied from a flat bottom grain bin, the force of the grain can quickly engulf and suffocate a worker. Workers should break up crusted grain from the outside with a long pole.

Grain Bins

- **Develop** and use lock-out protocols for unloading equipment to ensure that no equipment is started while workers are in a grain bin.
- **Install** ladders and ropes inside grain bins to provide grab holds and emergency exits. Paint ladders and exits with with brightly painted stripes so they can be easily located.
- **Attach** ropes to the ladders and from the top center of the bin. Make sure all workers wear a harness attached to the rope before entering.
- **Train** workers about the dangers of bridged grain and, if possible, have workers break up crusted grain from the outside of the bin with a long pole.

Silos

- **Train** workers to recognize signs of gas that may be present during the ensilage period.
- **Provide** good ventilation to the silo room to dissipate dense gases as they cascade out of the silo during fermentation.
- **When** the silo adjoins a barn or other building, keep the door between the structures closed to prevent gas from escaping into the livestock area.
- **Never** allow workers to enter a silo alone.
- **Run** silo blowers for 15 to 45 minutes before entering a silo, test to see if gases are present or if the atmosphere is oxygen deficient and provide SCBA respirators if silo gas is suspected.

Manure Pits

- **Educate** workers about the [hazards of manure pits](#).
- **Provide** a powered, continuous fresh air ventilation system for each manure pit. Ventilation is especially important when waste is agitated after it has been fermenting for some time. Because this system should consist of both supply and exhaust ventilation, two openings are required in the waste pit. Portable fans can be used if they have an explosion-proof design and are large enough to provide a continuous change of air within the pit.
- **Fit** all openings to manure pits with substantial metal grill covers to provide some natural ventilation and prevent accidental falls or entries into the pits.
 - Remember, however, that natural ventilation alone cannot maintain a safe atmosphere within the pit. Powered ventilation must be used before anyone enters the manure pit.
- **Eliminate** the need for entry into the pit by providing access to all serviceable parts (shears, pins, cleanouts, etc.) from the outside.
- **Provide** backup power for mechanical ventilation in case of power failure. Provide for equipment backup if any part of the ventilating system should fail.
- **Always** keep at least 12 inches of clear space between the highest manure level and the floor slats.
- **Post** hazard signs on all manure pits. The signs should be understandable to workers who cannot speak or read English. Signs in more than one language may be necessary.
- **Train** workers to never enter a manure pit without wearing SCBA-equipped respirators, and a safety harness attached to a lifeline. Have enough workers on hand with appropriate respirators to complete a rescue.

Additional Information:

- **Suffocation Hazards in Flat Storage Buildings and Tanks.** Dept. of Labor, OSHA, (1994, December). This bulletin provides awareness of suffocation hazards in grain handling facilities.
- **Confined Space Hazards a Threat to Farmers.** National Ag Safety Database, (1992, May). This page raises awareness of the risk of entering confined spaces and provides risk reduction techniques.
- **Beware of Manure Pit Hazards.** National Ag Safety Database, (1993, May). Provides information on asphyxiation from toxic gases in manure pits and safety precautions to protect workers.
- **Preventing Deaths of Farm Workers in Manure Pits.** DHHS NIOSH Publication No. 90-103, (1990, May). This alert describes two fatal manure pit incidents causing seven deaths and includes recommendations for protecting workers.
- **NIOSH Warns Farmers of Deadly Risk in Grain Suffocation.** DHHS NIOSH Publication No. 93-116, (1993, April). This update warns of grain bin fatalities from bridged-grain collapses and offers safety prevention recommendations.
- **Health Hazards in Agriculture - An Emerging Issue.** National Ag Safety Database, (1992, June). This page defines precautions that can be taken to minimize or eliminate potential respiratory hazards.

[Freedom of Information Act](#) | [Privacy & Security Statement](#) | [Disclaimers](#) | [Important Web Site Notices](#) | [International](#) | [Contact Us](#)

U.S. Department of Labor | Occupational Safety & Health Administration | 200 Constitution Ave., NW, Washington, DC 20210
Telephone: 800-321-OSHA (6742) | TTY: 877-889-5627
www.OSHA.gov