



HAZARD ALERT

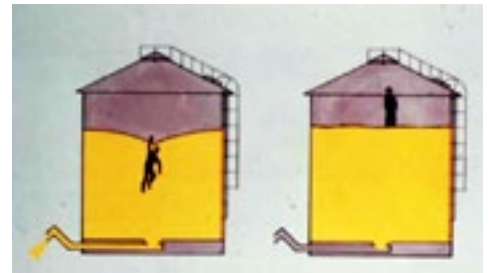
Engulfment and suffocation in grain bins

How do accidents happen?

Suffocation from engulfment is a leading cause of death in grain bins and the number of these deaths continues to rise. In fact, the number of deaths more than doubled nationwide between 2006 and 2010. You can suffocate when you enter a bin and are engulfed by grain, when the bin has hazardous gases, or when it lacks oxygen.

Accidents happen when:

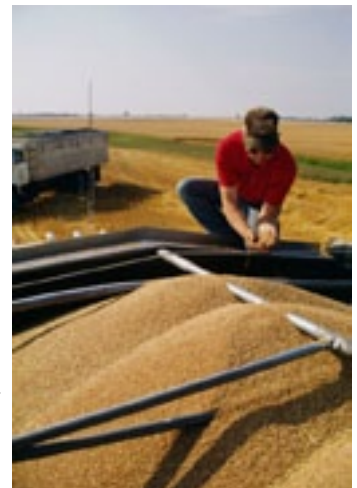
- **You get in a bin when the auger is running.** As the auger unloads the bin, grain flows to the outlet and is released, causing the grain above it to flow in and replace the released grain. Standing in moving grain forces the grain to flow to the outlet more quickly, especially when the auger is running. Moving grain is like quicksand and can bury you in just a few seconds. Never enter a bin when the auger is running!
- **You stand on or below a grain “bridge.”** “Bridging” happens when grain clumps together because of moisture or mold and a space forms under the bridge as grain is released. Bridged grain resists the downward pull that normally moves loose grain to the bin outlet but is rarely rigid enough to support a person. If you stand on a bridge, it can cave in and bury you in the empty space.
- **You get in the bin to loosen grain.** Even though the grain may appear safe, disturbing it can cause it to cave in. If you’re knocked off balance by the weight of the grain, you can be buried. Instead of trying to loosen grain from inside the bin, try bumping it with a pole through an access cover from the outside.
- **You get in the bin when the atmospheric conditions in the bin are dangerous.** There’s always a potential for oxygen levels to be at unsafe levels in the bin. There’s also a potential for hazardous gases to be present. Test the air in it for oxygen content and hazardous gases if you must enter.



Who is at risk?

Most workers at grain handling facilities are at risk of being trapped or buried by grain, but young workers are especially vulnerable because they may not be aware how dangerous grain bins are. Workers under the age of 16 are prohibited from entering grain bins and other confined spaces.

Accidents in grain bins often result in multiple deaths because other workers attempt to rescue their co-workers and become trapped or overcome as well. Pulling out a worker who is trapped in a grain bin requires a great deal of force – much more than is needed to rescue someone from under water. Water has buoyancy; grain does not, which makes it difficult to remove a buried worker. Human strength is usually not enough to rescue someone buried in grain.



Oregon
OSHA

Oregon OSHA
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Hazard alerts provide information on hazardous materials, equipment, or practices. For more information contact the Oregon OSHA Standard and Technical Resources Section at 503-378-3272, toll-free at 800-922-2689, or visit our website at www.orosha.org.

Engulfment and suffocation in grain bins - continued

Oregon OSHA's requirements

Oregon OSHA has requirements covering work in grain bins in its general industry and agriculture rules:

- **General industry rules:** *Division 2, Subdivision R, Grain Handling Facilities: 1910.272.*
- **Agriculture rules:** *Division 4, Subdivision J, Confined and Hazardous Spaces: 437-004-1250*



Doing the following can save workers' lives:

- Before entering the bin, de-energize and disconnect, lockout and tag-out, or block off all mechanical, electrical, hydraulic, and pneumatic equipment that presents a danger – especially augers.
 - > **General industry rules:** see *Grain Handling Facilities, 1910.272(g)(1)(ii)*
 - > **Agriculture rules:** see *Confined and Hazardous Spaces 437-004-1250(3)(h)*
- Prohibit workers from “walking down” the grain and similar practices to make the grain flow.
 - > **General industry rules:** see *Grain Handling Facilities, 1910.272(g)(1)(iv)*
- Prohibit workers from standing on or below a grain bridge, or where grain is built up on the side of a bin that could fall or bury them.
 - > **General industry rules:** see *Grain Handling Facilities, 1910.272(g)(6)*
- Train workers who must enter bins for the specific hazardous work they perform.
 - > **General industry rules:** see *Grain Handling Facilities, 1910.272(e)*
 - > **Agriculture:** see *Confined and Hazardous Spaces, 437-004-1250(4)*
- Ensure that a worker who enters a bin from a level at or above stored grain, or who walks or stands on stored grain, wears a body harness with an attached lifeline that prevents the person from sinking further than waist-deep in grain.
 - > **General industry:** see *Grain Handling Facilities, 1910.272(g)(2)*
 - > **Agriculture:** see *Confined and Hazardous Spaces, 437-004-1250(3)(b)(B) and 437-004-1250(3)(j)*
- Provide rescue equipment that is specifically suited for rescue from a grain bin.
 - > **General industry:** see *Grain Handling Facilities, 1910.272(g)(4)*
 - > **Agriculture:** see *Confined and Hazardous Spaces, 437-004-1250(5)*
- Station an observer outside the bin who is equipped to provide assistance and perform a rescue.
 - > **General industry:** see *Grain Handling Facilities, 1910.272(g)(3)*
 - > **Agriculture:** see *Confined and Hazardous Spaces, 437-004-1250(3)(b)(B) and 437-004-1250(3)(j).*
- Ensure that visual, voice, or signal line communication is maintained between the observer and workers who enter the bin.
 - > **General industry:** see *Grain Handling Facilities, 1910.272(g)(3)*
 - > **Agriculture:** see *Confined and Hazardous Spaces, 437-004-1250(3)(b)(C)*
- Test the air in a bin for oxygen content and hazardous gases before entry.
 - > **General industry:** see *Grain Handling Facilities, 1910.272(g)(1)(iii)*
 - > **Agriculture:** see *Confined and Hazardous Spaces, 437-004-1250(3)(a)*
- Provide continuous ventilation until any hazardous atmospheric conditions are eliminated. If toxicity or oxygen deficiency cannot be eliminated, workers in the bin must wear appropriate respirators.
 - > **General industry:** see *Grain Handling Facilities, 1910.272(g)(1)(iii)(A) and (B)*
 - > **Agriculture:** see *Confined and Hazardous Spaces, 437-004-1250(3)(c)(C) and 437-004-1250(3)(f)*
- Issue a permit each time a worker enters a bin, unless the employer representative who would authorize the permit is present during the entire entry operation. The permit must certify that the above items have been implemented before workers enter the bin.
 - > **General industry:** see *Grain Handling Facilities, 1910.272(g)(1)(i)*