



WORKER ENTRY INTO GRAIN STORAGE BINS

ENGULFMENT AND SUFFOCATION HAZARDS

Grain storage bin entry is very dangerous and exposes workers to serious suffocation hazards, a leading cause of fatalities in this industry. Suffocation can occur when workers are engulfed by grain or when bins develop hazardous atmospheres or a lack of oxygen.

Engulfment can happen when a worker:

- Stands on moving/flowing grain (Figure 1). The moving grain acts like quicksand and buries the worker in seconds.
- Stands on or below a “bridging” condition (Figure 2). Bridging occurs when grain clumps together because of moisture or mold, creating an empty space beneath the grain as it is unloaded. If a worker stands on or below the bridged grain, it can collapse, burying the worker.
- Stands next to an accumulated pile of grain on the side of the bin (Figure 3). The grain pile can collapse onto the worker unexpectedly or when the worker attempts to dislodge it.

Figure 1



From the time the auger starts, you have 2-3 seconds to react. In 4-5 seconds you are trapped. After 22 seconds, you are completely covered.

Figure 2



A grain bridge is a dangerous situation created by a previous partial unloading of the bin. As unloading begins, bridged grain falls into the air space and the worker is instantly trapped. Before the grain flow can be stopped, the worker is covered. In seconds, suffocation occurs.

Figure 3



Beware of a steep pile of grain because it may tumble down and result in suffocation.

Figure 4



For safe grain handling, never go in the bin without a safety line and backup. The person on the inside should be secured to the outside of the bin. The person on the roof can pass instructions and assist in lifting. The person on the ground can go for help or assist in pulling.

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The grain's behavior and weight make it extremely difficult for a worker to get out of the grain without assistance. Tragically, incidents in grain bins often result in multiple fatalities because coworkers attempt rescue and fall victim as well. These fatalities are preventable if employers follow work practices and provide training and equipment as required by OSHA's Inspection of Grain Handling Facilities standard (29 CFR 1910.272).

WHERE WORKERS ENTER STORAGE BINS, EMPLOYERS MUST:

- Turn off and disconnect, lockout/tagout, or block off all mechanical, electrical, hydraulic, and pneumatic equipment that presents a danger, particularly grain-moving equipment. Grain must not be emptied or moved into or out of the bin while workers are inside because it creates a suction that can pull the worker into the grain in seconds.
- Prohibit walking down grain and similar practices where a worker walks on grain to make it flow.
- Prohibit entry onto or below a bridging condition, or where grain is built up on the side of the bin.
- Provide each worker with a body harness with a lifeline or a boatswain's chair if they entering a bin from a level at or above stored grain, or when a worker will walk or stand on stored grain. Ensure that the lifeline is long enough to prevent a worker from sinking further than waist-deep in grain.
- Provide workers with rescue equipment, such as winch systems that are specifically suited for rescue from the bin (Figure 4).
- Station an observer who is equipped to provide assistance and perform rescue operations outside the bin (Figure 4).
- Ensure that communications (visual, voice, or signal line) are maintained between the observer and the workers who entered the bin.
- Test the air within a bin for oxygen content and the presence of hazardous gases before entry.

- Provide and continue ventilation until any unsafe atmospheric conditions are eliminated.
- If toxicity or oxygen deficiency cannot be eliminated, workers must wear appropriate respirators.
- Issue a permit each time a worker enters a bin unless the employer is present during the entire entry operation. The permit must certify that the above precautions have been implemented before workers enter the bin.

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ADDITIONAL GUIDANCE

For additional information on safe work practices in grain handling facilities, please see:

- [OSHA 29 CFR 1910.272](#), Grain Handling Facilities.
- For additional information on safe work practices in confined spaces, see [OSHA 29 CFR 1910.146](#), Permit-Required Confined Spaces.
- For additional information on respirators, see [OSHA 29 CFR 1910.134](#), Respiratory Protection.
- For information on preparing young workers to work safely, visit [osha.gov/young-workers/](https://www.osha.gov/young-workers/) or [osha.gov/etools/youth-agriculture/](https://www.osha.gov/etools/youth-agriculture/).
- For a comprehensive list of OSHA standards and regulations, refer to Title 29 of the Code of Federal Regulations.

PREVENTION IS EVERYONE'S BUSINESS. TRUST IN TOMORROW.® CONTACT YOUR AGENT TODAY TO LEARN ABOUT OUR LOSS PREVENTION PROGRAMS.

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