SCAFCO Grain Systems Co.

NOTHING IS MORE IMPORTANT THAN SAFETY!

At SCAFCO Grain Systems Company, nothing is more important than safety. This is why we offer grain entrapment prevention kits for all of our flat bottom bins and large hopper bottom bins.

ASABE Standard
S624
ENDEAVORS TO PREVENT GRAIN ENTRAPMENT.

THE BASIC TOOLS REQUIRED TO PREVENT ENTRAPMENT FOR PERSONNEL ENTERING THE BIN ARE RELATIVELY SIMPLE.

Over the past decade, the number of grain entrapments on farms and in commercial grain storage facilities has increased. Dr. William Field of Purdue University has tracked these mostly-preventable accidents for more than thirty years. The worst year in recent history was the 2010 grain storage season, with over 50 grain entrapments and 28 fatalities. The Grain Elevator & Processing Society (GEAPS) had campaigned for awareness of these rising numbers of fatalities before 2010, but after that devastating season, they grew more aggressive in their efforts to educate the grain storage industry about the hazards of grain entrapment. They also pursued specialized training for fire fighters rescuing personnel trapped inside grain storage structures.

People enter bins for a variety of reasons, but the predominant reason for most entrapments has been entry to check on "out of condition" grain that won't flow to the center discharge point. People enter the bin to attempt to dislodge the blockage, and many times the grain collapses under them or starts to flow rapidly to the discharge opening, drawing the person inside the bin into the grain mass, where they become entrapped or completely engulfed by stored grain. Failure to shut off the unloading auger or conveyor often contributes to these accidents.

For about a decade, the American Society of Agricultural and Biological Engineers (ASABE) has partnered with GEAPS in an effort to provide a consensus standard for Grain Bin Entry in order to prevent grain entrapments. Naturally, the coalition has focused this effort on the bin manufacturers, encouraging the design of bins that feature tools to assist those who enter the bins. SCAFCO's Daniel Wambeke, P.E., led this group for the many years. The committee authored standard S624 Grain Bin Access Design Safety, which earned both a Standards Development Award and a President's Citation from ASABE in 2019.

S624 endeavors to prevent grain entrapments. The basic tools required to prevent entrapment for personnel entering the bin are relatively simple. There are several basic rules recommended for personnel entering the bin to prevent grain entrapment:

1. **Never enter a bin unless no other solution exists to resolve the storage or unloading problem.**
2. **Always shut off all filling and discharge augers and conveyors. The industry byword for this rule is "Lockout-Tagout," and the Occupational Safety & Health Administration (OSHA) requires that it be followed in commercial operations.**
3. **Never enter a bin alone. Always have an observer watching you outside the bin to assist you in case problems develop.**
4. **Install entrapment prevention anchor kits (EPAKs) in every bin you own. These kits are inexpensive, easy to install and will update your bins to allow safe entry for any work that needs to be done.**
5. **When entering a bin with grain inside, always use a quality safety harness, approved safety rope and a prusik rope brake. These items work with the EPAK components, allowing your observer to assist with your safe entry into the bin.**

In addition to the EPAKs and harnesses, there are bin entry kits that include many safety items that can be used for entering bins. Bin entry kits typically consist of the items seen to the right – one rope bag, 100 feet of 12.5 mm rescue rope, 70 N carabiners, two 8 mm prusik-rope sets, one rope pad, one anchor sling, one prusik minding pulley, and 20 feet of webbing.

A simple safety rope attached to the person inside the bin may not be enough to restrain the person from being entrapped in grain. It is very difficult for the attendant standing outside the bin to restrain the weight of the person inside the bin if the grain flow or collapse of a hidden dome pulls him down into the grain. If the trapped person is engulfed above their knees, they cannot extract themselves from the grain mass and requires assistance to prevent further engulfment.

Flowing grain behaves like quicksand. It can pull a 165-pound man down to waist level in seconds and bury him in less than a minute. Once grain gets above the knees, the amount of friction and pressure exerted on a person's body makes escape without assistance nearly impossible.

Typical bin entry kit

SCAFCO has Entrapment Prevention Anchor Kits that fit any bin.

Entrapment Prevention Anchor Kit Part No. 219522E

Anchor point installed at the roof compression ring

Anchor point installed below the roof inspection hatch

As a result of our constant efforts toward improving bin safety, SCAFCO has developed an Entrapment Prevention Anchor Kit. This kit consists of two "anchor points" for installation in any bin: one to be connected to the roof compression ring, and one to be installed inside the roof inspection hatch. These anchor points include forged eyebolts and their preferred bin locations are illustrated above. Each anchor point comes with a warning decal with pertinent information for end users.

Using the anchor points, the safety rope, the prusik brake, and the attendant outside the bin paying out the rope in small increments not more than 12" [300 mm] at a time, the person inside the bin can be restrained from falling more than 2'0" [0.61m] (in grain up to his knees), keeping him from being engulfed in the grain mass. A quality safety harness is also required for bin entry. Using this system, the person can safely extract himself from the grain around his legs.

The other elements required to supplement the anchorage points are a simple "clothesline" rope (a 1/4" [6 mm] nylon rope) and a knot-passing pulley to attach to the peak anchorage point.

Attach the clothesline rope to the anchorage point near the roof inspection hatch with a pulley and wrap it around the knot passing pulley at the peak anchorage point. This rope is used to pull the rated safety rope up to the peak, through the knot passing pulley attached to the peak anchor point and back to the entrance point. Once the person entering the bin is inside the bin, the safety rope can be attached to his harness.

In light of the high risk of grain entrapment, and given that more than half of entrapments result in fatalities, SCAFCO's calling all customers' attention to the life-saving importance of Entrapment Prevention Anchor Kits and Bin Entry Kits. Proper use of this equipment with all bins will improve safety, meet OSHA requirements, and help prevent grain entrapments. Please also remember: Always have an attendant outside the bin before entering any bin with grain.

For Entrapment Prevention Anchor Kits that fit any bin, please contact us at info@SCAFCOgrain.com

SCAFCO Grain Systems Co. BUILT for LIFE™

5400 E. Broadway Avenue
PO Box 11215
Spokane, WA 99211 USA

Phone: +1-509-535-1571
E-mail: info@SCAFCOgrain.com
www.SCAFCOgrain.com