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BUCKETBULLETIN

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Reducing *Safety Hazards* On Agricultural Bucket Elevators

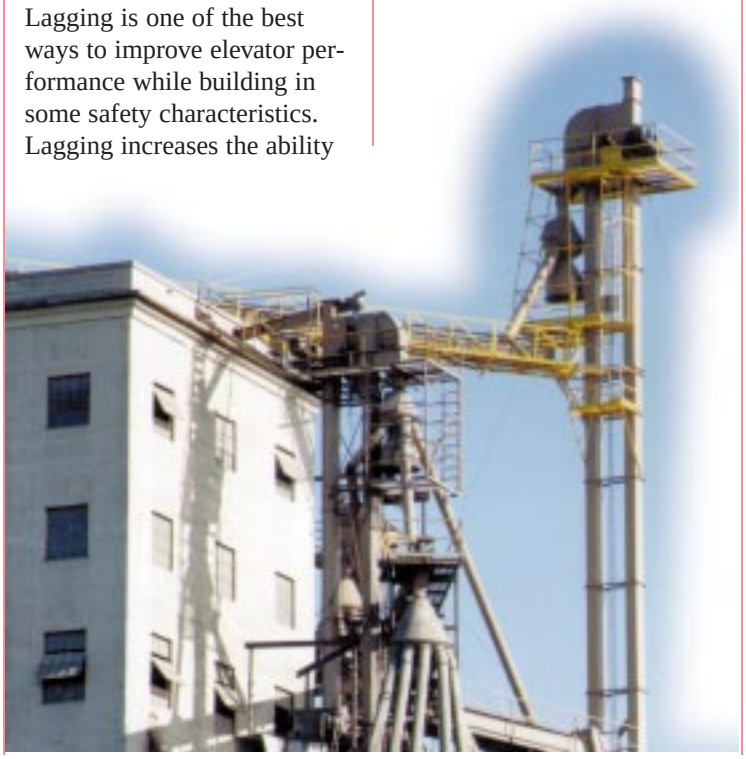
It seems that every year disaster strikes a grain handling facility not only destroying equipment but, often times, injuring or killing personnel. With the volatile nature of grain products and their dusts, the possibilities of future explosions or fires is only too real. With safety in mind, here are some tips to help prevent this from happening to you.

HEAD LAGGING

Lagging is one of the best ways to improve elevator performance while building in some safety characteristics. Lagging increases the ability of an elevator to pull itself out of a potential choke. In the case of a choke, it will put a greater load on the motor causing a quicker response from overload relays and fuses in shutting down the leg.

MOTORS

When choosing a motor, look for a totally enclosed fan-cooled motor with a Class II rating for Group G locations (combustible dusts in the air). It is also critical the proper size motor be selected to fit the horsepower requirements for the leg. Insufficient horsepower can cause motor failure, while excess horsepower may result in pulley slippage and burned belting.



BACK STOPS

Back stops are necessary to help avoid leg chokes. The back stop prevents the stopped leg from rotating backwards due to the weight of the grain in the cups on the up leg side.

This keeps the grain from dumping back in the boot - section of the leg, clogging the boot.

THROAT WIPER

A properly installed throat wiper plate, or anti back-leg deflector, should be installed and maintained on every elevator. This plate is typically nothing more than a stiff piece of belting mounted on the edge of the discharge throat. It extends to within a 1/4" of the bucket lip. It is designed to deflect grain into the throat instead of letting it go back down the elevator trunking.

EXPLOSION RELIEF VENTS

Explosion relief vents are designed to guide explosive forces through a path of least resistance out to an area of little consequence. On interior legs, the venting should

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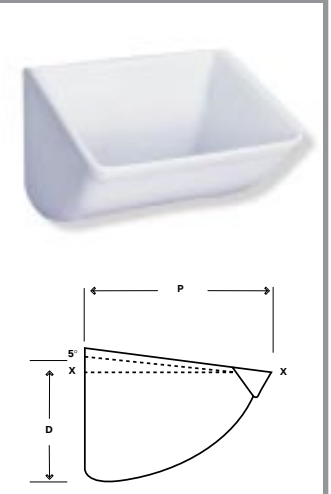
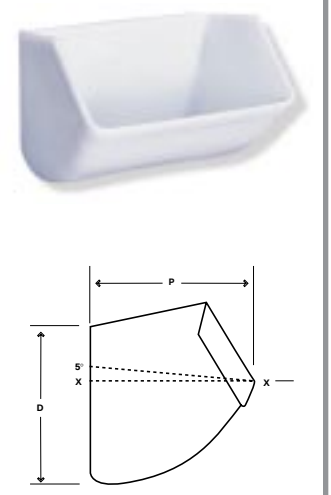
The "Hy-Pro" Way To More Capacity

Hy-Pro Bucket



Standard Profile Bucket



More and more often these days we get a call from an agricultural customer wanting to increase elevator capacity. He could build a new leg, or put in larger buckets if he has the trunk clearance, or he could go the "Hy-Pro" way to more capacity.

"Hy-Pro" or High Capacity-Low Profile Elevator Buckets were developed specifically to provide higher capacity in smaller agricultural elevators. The concept is simple: reduce the back-wall height profile of the bucket to allow for closer spacing on the belt without reducing the cup's carrying capacity. The result is more cups per foot of belt and more elevator capacity.

For example: Consider an elevator using 9x6 regular profile buckets on 8" vertical centers (nominal projection +2") standard spacing. Theoretically, this would allow for 1.5 buckets per foot of belt (12"/8"). If each bucket has a water level capacity of 146.45 cubic inches, then:

Per foot	
Buckets	1.5
X Bkt. Capacity	146.45
Capacity Per Foot	219.70

(cubic inches)

If the Hy-Pro bucket is used, the spacing drops to 4-1/2" vertical centers. This would allow for 2.67 elevator buckets per foot of belt. Since bucket capacity does not change, then:

Per Foot	
Buckets	2.67
X Bkt. Capacity	146.45
Capacity Per Foot	390.50

(cubic inches)

This would result in an increase in elevator capacity of slightly more than 77%.

Spacing can be adjusted between the minimum and standard to more precisely gauge elevator capacity.

Before converting to the "Hy-Pro" design, some other factors should be considered. Because there will be additional weight from both the cups and the elevated material, horsepower and belting requirements should be examined to ensure both meet safe operating conditions.

If you would like more information about "Hy-Pro" elevator buckets, or would like help calculating capacity for your specific application, call our team. We will be glad to help you with your capacity upgrade needs.

Maxi-Tuff Customer Gets National Attention

Following the customer profile "Maxi-Tuff Proves A Perfect Solution For Osburn Materials" in the Winter/Spring 1997 Bucket Bulletin, Rock Products magazine decided to investigate the situation at Osburn Materials for themselves. What they found was the superior performance we had already told you about. Read the story in the March 1998 Rock Products issue, p 58. Find out why Maxi-Tuff is "The New Standard."

Maxi-Lift Wants To Tell Your Story

If you have a product success story you think is worth telling, call us. Maxi-Lift would be happy to publish the information in an upcoming Bucket Bulletin. Your successes may be the answer to someone's application problem.

QUICK TIPS

Measuring An Elevator Bucket

1. The bucket width is measured at the back mounting surface. Lay the bucket on its back for actual measurement dimensions.

2. The projection is measured vertically to the lip, as it would project from the belt or chain.

3. Depth is measured for the overall side profile dimension.

Fertilizer Plant Cuts Wear, Eliminates Downlegging With Tiger-Tuff® Elevator Buckets

Quiet, efficient operation is welcome at Countrymark Fertilizer in Fostoria, Ohio. Sounds of downlegging potash and diammonium phosphate, coupled with the clang of stainless steel digger buckets, made the plant's fertilizer leg sound like a worn-out windmill in a West Texas sandstorm ... but not anymore.

In 1949, Ohio Farmers built an ammoniation plant to supplement their fertilizer needs in the highly agricultural region. The plant currently mixes and sells tens of thousands of tons annually. The combinations of potash and diammonium phosphate have taken their toll on equipment around the plant, including its elevators and buckets.

"We were changing elevator buckets every twelve to eighteen months," said Terry Nye, Countrymark's maintenance supervisor. The buckets they were replacing were the popular blue "cchd" style polyethylene. Unfortunately, they were not getting the kind of life Countrymark required despite using stainless steel diggers to supplement the "cchd" buckets. The abrasive fertilizer components caused too much wear, creating a loss of capacity and eventual bucket failure.

Nye and Crawford standing next to the Burton Mixer elevator.

The Tiger-Tuff's superior design stands up to the abrasive fertilizer application.

In June 1997, Terry Arrick, plant manager, decided it was time to look for a solution. A distributor suggested they take a look at the new TIGER-TUFF® maximum duty elevator bucket from Maxi-Lift. The TIGER-TUFF® is designed with more material in all of the high wear areas.

Formulated to wear less, elevate more, and outlive any other high speed grain bucket, the TIGER-TUFF® looked like it could solve the wear problem.

The maintenance crew installed the new buckets in July 1997. The 10-year-old Burton Mixer elevator has never performed better. Designed with an 18" head pulley, the buckets travel at a rate of 568 feet per minute, carrying a little more than 2 tons per minute. With the speed right off most engineering charts, the leg used to downleg a lot using the blue "cchd" cups. "The new buckets virtually eliminated the downlegging we were experiencing." said Nye. Nye also removed the expensive stainless steel digging buckets Countrymark was using because they became unnecessary with the thicker lipped TIGER-TUFF®.

Recent inspection of the buckets reinforced Arrick's decision to buy and install the TIGER-TUFF®'s. After months of use, the orange buckets show no significant wear. Performing beyond their expectations, the TIGER-TUFF® solved Countrymark Fertilizer's tough application problem.

Maxi-Lift, Inc. makes 10 sizes of TIGER-TUFF® maximum duty elevator buckets. For more information or copies of this case study, call 800-527-0657 or write to:

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extend through the roof.

BIN LEVEL INDICATORS

These devices are actuated when a bin becomes filled. It can be installed in a grain distributor and linked to the controls of the elevator. If grain backs up into the distributor, the switch would stop the leg to eliminate over-filling and a backup problem in the leg.

ELEVATOR BUCKETS

Elevator buckets, when the application permits, should be of the non-metallic variety. Steel elevator buckets can cause sparking if they strike other metallic objects in the leg. Steel buckets may also have more difficulty freeing themselves from hang-ups or obstructions.

Plastic elevator buckets do not conduct sufficient static to produce a spark, and tend to pull free from leg obstructions. Most agricultural applications can easily be handled with plastic elevator buckets like the TIGER-TUFF® or the Maxi-Lift standard duty.

GOOD BROOMS

The easiest of all safety steps is a regularly maintained cleaning program. Accumulations of grain dust in elevator houses provide the fuel for explosions that may be touched off by a small spark. Proper equipment makes this rather mundane task easier and more likely to be performed on a regular basis.

These are just a few safety tips designed to make the elevator environment a safer one. Information for this article was provided by The Association of Operative Millers' Cereal Millers Handbook. Maxi-Lift Inc. provides this information only as a service, and in no way implies the validity of this information. Contact the Association of Operative Millers or your safety expert for more details.

*Contributions to this article came from The Association of Operative Miller's Cereal Millers Handbook.

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Maxi-Lift Goes Bilingual With New Spanish Catalog

Maxi-Lift is proud to announce the publishing of our new 27 page Spanish language catalog. This full line catalog is complete with product illustrations, application information and specifications all in Spanish. If you would like copies of the new catalog, call us at 1-800-527-0657. Gracias!

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