

# Lighting and Marking Self-Propelled Equipment Meeting Kit – Spanish

## QUÉ ESTÁ EN RIESGO

Todo el mundo desempeña un papel fundamental a la hora de ayudar a prevenir las colisiones en la carretera, asegurándose de que el equipo sea lo más visible posible para los demás automovilistas.

## CUÁL ES EL PELIGRO

### PELIGROS

Los estudios sobre las colisiones entre vehículos lentos y vehículos de motor concluyen que casi el 90 por ciento se producen en carreteras secas durante el día y que dos tercios son colisiones por detrás.

Los tractores, con o sin equipo de arrastre, y los implementos autopropulsados son lo suficientemente grandes como para ser claramente visibles en la carretera, especialmente durante las horas del día. Sin embargo, hay muchos accidentes en los que están implicados vehículos agrícolas.

## COMO PROTEGERSE

### PROTECCIÓN/PREVENCIÓN DE LA CIRCULACIÓN SEGURA

#### Iluminación

El alumbrado de las extremidades y la señalización con material reflectante combinados pueden ser una protección muy eficaz contra las colisiones en la carretera. Utilizados conjuntamente, los demás automovilistas pueden identificar rápidamente y con precisión que un equipo grande y de movimiento lento está en la

carretera.

### **Recomendaciones para la iluminación:**

- La iluminación es necesaria desde 30 minutos antes de la puesta del sol hasta 30 minutos después de la salida del sol.
- Debe haber dos lámparas blancas colocadas lo más separadas posible en la parte delantera del vehículo, visibles desde al menos 1000 pies hacia la parte delantera del vehículo.
- Debe haber dos luces rojas lo más separadas posible en la parte trasera del vehículo, visibles desde al menos 1000 pies hacia la parte trasera del vehículo.
- Debe haber al menos una luz de señalización ámbar intermitente en la parte delantera y trasera del vehículo, montada lo más alto posible y visible desde al menos 500 pies.

### **En VEHÍCULO DE MOVIMIENTO LENTO (SMV)**

El emblema de vehículo de movimiento lento (SMV) es siempre obligatorio.

Este emblema no es sólo una característica práctica de seguridad, sino también un requisito para los “aperos de labranza” en movimiento en las vías públicas.

Una característica práctica del vehículo de movimiento lento es advertir a los vehículos que se acercan para que reduzcan la velocidad. Si un coche viaja a 55 mph cuando está a 400 pies detrás de un tractor que viaja a 15 mph, sólo tarda 7 segundos en alcanzar al tractor. Una colisión a tan altas velocidades puede ser peligrosa.

Es fundamental que los vehículos de movimiento lento estén limpios y visibles. Si los vagones o implementos que se están remolcando oscurecen el vehículo de movimiento lento en el tractor, entonces el vagón o implemento más atrasado necesita tener un SMV en su lugar.

El emblema SMV, debido a su naturaleza y forma reflectante, puede

encontrarse en muchos lugares inapropiados, como entradas a la carretera, marcadores de carril y en los postes de los buzones. Este uso disminuye el valor del vehículo de movimiento lento como dispositivo de advertencia para advertir a los vehículos que se acercan con el SMV montado en ellos.

## **MATERIALES REFLECTANTES**

**Material fluorescente** que es visible tanto de día como con poca luz. El material naranja fluorescente en el centro de los nuevos emblemas SMV estándar de la ASAE es visible al doble de distancia que el material anterior. Los materiales de color fluorescente se componen de tintes fluorescentes que son brillantes, pero lamentablemente se descomponen y pierden su brillo (desvanecimiento) con el tiempo.

**El material retrorreflectante** está diseñado para redirigir la luz directamente hacia su fuente. En el caso de una señal de un vehículo de movimiento lento, el borde triangular está hecho de cinta retrorreflectante roja que refleja la luz de los faros de los conductores directamente hacia atrás, creando un efecto de advertencia visible. El borde retrorreflectante de las nuevas señales de vehículo de movimiento lento es más de 10 veces más brillante que el diseño de las señales de un vehículo de movimiento lento más antiguas.

## **LÁMPARAS/SEÑALES**

**Luces traseras.** Los tractores y otros equipos autopropulsados deben tener dos luces traseras rojas visibles desde la parte trasera de la máquina, montadas simétricamente a no más de 1,5 m (5 pies) a la izquierda y a la derecha del centro de la máquina y entre 1 y 3 m (3,3 y 12 pies) de altura.

**Luces de advertencia intermitentes de color ámbar.** Los tractores y los equipos autopropulsados deben tener al menos dos luces de advertencia intermitentes de color ámbar, visibles desde la parte delantera y trasera de la máquina, y situadas a una altura mínima de 1 m (39 pulgadas). En las máquinas de más de 3,7 m (12 pies) de ancho, las luces de advertencia deben estar montadas a menos de

400 mm (16 pulgadas) de los bordes exteriores de la máquina, incluidas las ruedas dobles, los ejes anchos y los cabezales.

**Señales de giro.** Cuando conduzca por vías públicas, utilice siempre los intermitentes. Los intermitentes adecuados tienen una acción de dos partes. En primer lugar, la luz de advertencia intermitente de color ámbar opuesta a la dirección del giro se enciende de forma constante y, a continuación, la luz trasera roja parpadea en la dirección del giro.

## **RECAPITULACIÓN DE LA RESPONSABILIDAD**

- Inspeccione la maquinaria para comprobar que las luces y los materiales reflectantes son adecuados.
- Reequiper los equipos más antiguos con nueva cinta retrorreflectante, iluminación en las extremidades y nuevas señales de un vehículo de movimiento lento.
- Asegúrese de que cada vehículo lento y pieza de equipo arrastrado tenga un emblema de vehículo lento correctamente colocado, limpio y no descolorido.
- No utilice los emblemas de un vehículo de movimiento lento para señalizaciones estacionarias, como por ejemplo para un camino de entrada o un buzón; es ilegal y puede causar confusión y colisiones. Un mal uso prolongado puede hacer que los símbolos pierdan su eficacia como dispositivo de advertencia.
- Anticípese a los problemas que puedan tener los automovilistas debido a su escasa experiencia con los vehículos de baja velocidad.

## **CONCLUSIÓN**

Ya sea que esté realizando trabajos en el campo, transportando maquinaria agrícola, operando cualquier maquinaria, la clave de la seguridad es “ver y ser visto”. Cada luz y reflector en un tractor, autopropulsado o implemento tiene un propósito específico.

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# Lighting and Marking Self-Propelled Equipment Stats and Facts – Spanish

## HECHOS

1. Los tractores y otros equipos agrícolas autopropulsados de movimiento lento para trasladar las mercancías de la granja a un mercado o distribuidor. El aumento de la exposición a la carretera ha llevado a una creciente preocupación por la ocurrencia de accidentes con equipos agrícolas.

2. Los gobiernos estatales y locales mantienen las carreteras y las instalaciones **de iluminación** en ellas. Si un fallo en el alumbrado de la carretera provoca un accidente, los demandantes lesionados deben presentar una reclamación contra el organismo gubernamental responsable del mantenimiento de la carretera.
3. Las empresas de transporte tienen la obligación de garantizar que sus conductores tengan las licencias y la capacidad adecuadas para conducir sus camiones. También deben garantizar que esos camiones sean seguros para conducir, y **la iluminación** es una parte importante de esto.
4. **Los reflectores y la cinta reflectante** ayudan a los demás conductores a distinguir los camiones en la carretera por la noche. Dependiendo de la ubicación, el color del camión y la luz disponible en la zona, un camión y su remolque pueden ser extremadamente difíciles de distinguir por la noche.

## ESTADÍSTICAS

- Según la Organización Internacional del Trabajo, cada año se registran unas 335.000 muertes en las explotaciones agrícolas.
- Entre las piezas peligrosas de la maquinaria agrícola se encuentran las picadoras y las achicadoras de heno. Los silos y depósitos de grano son lugares peligrosos para los trabajadores agrícolas, aunque se cobran una décima parte del número de víctimas que los tractores. Los trabajadores agrícolas se han asfixiado y aplastado con el peso del grano en estos accidentes.
- Los accidentes con maquinaria agrícola suelen ser terribles y espeluznantes por su naturaleza. En algunos casos, los propietarios u operadores de las granjas no proporcionan condiciones de trabajo seguras. Los tractores pueden estar mal mantenidos o carecer de luces. Los trabajadores suelen carecer del equipo de seguridad adecuado.
- Los trabajadores agrícolas son jóvenes o pueden ser inmigrantes indocumentados mal pagados. Según la granja Bureau Georgia, uno de cada siete trabajadores está empleado

en la agricultura en el Estado del Melocotón.

- La agricultura aporta más de 73.000 millones de dólares a la economía de Georgia cada año. El estado cuenta con más de 42.000 explotaciones agrícolas.
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# Lighting and Marking Self-Propelled Equipment Stats and Facts

## FACTS

1. Tractors and other slow-moving self-propelled farm equipment to transfer goods from the farm to a market or distributor. Increased roadway exposure has led to a growing concern on the occurrence of farm equipment crashes.
2. State and local governments maintain the roadways and the **lighting fixtures** on them. If a roadway lighting failure causes an accident, the injured plaintiffs must file a claim against the government agency responsible for the road's maintenance.
3. Trucking companies have a duty of care to the public to ensure their drivers have the appropriate licenses and skill to operate their trucks. They must also ensure those trucks are safe to drive, and **lighting** is an important part of this.
4. **Reflectors and reflective tape** help other drivers notice trucks on the road at night. Depending on the location, the color of the truck, and the available light in the area, a truck and its trailer can be extremely difficult to discern at night.

# STATS

- About 335,000 farm deaths are reported worldwide every year, according to the International Labour Organization.
  - Dangerous pieces of farm equipment include choppers and hay bailers. The silos and grain bins are hazardous places for farm workers, although they claim a tenth of the number of victims as tractors. Farm workers have been suffocated and crushed with the weight of grain in these accidents.
  - Farm machinery accidents are often terrible and grisly by their nature. In some cases, the farm owners or operators fail to provide safe working conditions. Tractors may be poorly maintained or lack lights. Workers often lack the correct safety equipment.
  - Farm workers are young or they may be poorly paid, undocumented immigrants. According to Farm Bureau Georgia, as many as one in seven workers are employed in agriculture in the Peach State.
  - Agriculture puts more than \$73 billion into the economy of Georgia every year. The state has more than 42,000 farms.
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## Lighting and Marking Self-Propelled Equipment Fatality File – Spanish

### La maquinaria agrícola causa terribles accidentes y lesiones

En diciembre de 2018, el conductor de un tractor murió cuando fue golpeado por detrás por un camión de volteo en el condado de Peach. La policía dijo que el conductor del camión de volteo no

vio el tractor en la carretera rural hasta que fue demasiado tarde. La Patrulla Estatal de Georgia dijo que el tractor carecía de las luces o del equipo de seguridad reflectante en la parte trasera que exige la ley.

Los accidentes con maquinaria agrícola ocurren con demasiada frecuencia en Georgia. En ocasiones, el equipo no cumple con la normativa.

Los accidentes que involucran maquinaria agrícola a menudo ocurren temprano en la mañana o al atardecer, como fue el caso del reciente accidente en el condado de Peach.

Los agricultores mueven con frecuencia los equipos a esas horas, pero la falta de iluminación natural hace que los trabajadores agrícolas sean objetivos sentados. La baja velocidad a la que operan la mayoría de los tractores pone en riesgo a los trabajadores agrícolas. A menudo, los vehículos que circulan a gran velocidad tienen poco tiempo para frenar cuando toman una curva y se encuentran con la maquinaria agrícola.

Las colisiones frontales también son habituales en estos escenarios, ya que los conductores intentan adelantar a los tractores que circulan lentamente. Si no puede ver la carretera más allá de la maquinaria agrícola, no se arriesgue a adelantar.

Los tractores son la maquinaria más mortífera.

Los trabajadores agrícolas sufren lesiones y muertes en los vuelcos de tractores, así como en los accidentes de tráfico.

Conducir un tractor por una pendiente, un terreno resbaladizo o accidentado es una empresa peligrosa. Tirar de una carga pesada aumenta los peligros porque el tractor puede desequilibrarse.

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# Lighting and Marking Self-Propelled Equipment Fatality File

## Farm Machinery Causes Terrible Accidents and Injuries

In December 2018, the driver of a tractor died when he was hit from behind by a dump truck in Peach County. Police said the driver of the dump truck failed to see the tractor on the rural road until it was too late. Georgia State Patrol said the tractor lacked the lights or reflective safety equipment on the back that are required by law.

Farm machinery accidents happen far too often in Georgia. On occasions, the equipment fails to comply with regulations.

Accidents involving farm equipment often occur early in the morning or at sunset as was the case in the recent wreck in Peach County.

Farmers frequently move equipment around at these times but the lack of natural lighting means farm workers are sitting targets. The low speed most tractors operate at puts farmer workers at risk. Often fast-moving vehicles have little time to brake when they round a curve and encounter farm machinery.

Head-on collisions are also common in these scenarios as drivers attempt to overtake slow-moving tractors. If you can't see the road beyond a piece of farm machinery, don't take the risk of overtaking.

Tractors are the most deadly piece of machinery.

Farm workers suffer injury and deaths in tractor rollovers as well as road accidents.

Driving a tractor on a slope, a slippery or rough terrain is a dangerous undertaking. Pulling a heavy load increases the dangers because the tractor can become unbalanced.

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# Lighting and Marking Self-Propelled Equipment Picture This – Spanish

**Faros LED de Trabajo.**



**Cumple con las normas**  
Establecidas por la ley con las lámparas LED, que te ayudarán a señalizar tu tractor y mejorar tus condiciones visuales cuando manejes.

**Sin importar las condiciones**  
Las lámparas LED, tienen una forma de fabricación, que ayudan a no sobre calentarse si se presenta lluvias o largas jornadas laborales con más de 20 mil horas de uso.

**Más iluminación, más calidad.**  
Con más claridad en el lugar donde reflejes la luz, lograrás trabajar en condiciones visuales complejas, en días con poca visibilidad o de noche.

**Fuente:** <https://extension.psu.edu>

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# Lighting and Marking Self-Propelled Equipment Picture This



Source: <https://www.casa-acsa.ca>

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## Quick Course – Avoid Harmful Horseplay

Horseplay is rough play, practical jokes and other physical humor which can endanger workers. This quick course covers the dangers of horseplay and how to protect yourself from these dangerous actions including thinking of the victim, discouragement, training and reporting.

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# Quick Course – Keep Safety On Hand

Even a minor hand injury can be painful and inconvenient. You don't want to find out how life-changing a major hand injury would be. This quick course covers the danger of hand injuries and how to protect yourself from common hand injuries.

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## What is an AED and Defibrillator Training – Quick Tips

Learn about AEDs, from appropriate use to required training.

According to the Centers for Disease Control and Prevention (CDC), nearly 600,000 people die each year from heart disease. Sudden cardiac death is a sudden, unexpected death caused by sudden cardiac arrest. It is responsible for half of all heart disease deaths.

Preventing death caused by sudden cardiac arrest requires fast action and a critical sequence of events, including early activation of the emergency medical services (EMS) system (calling 911), early cardiopulmonary resuscitation (CPR), early defibrillation and early advanced care at a medical facility. A fifth event in this sequence includes post-resuscitation care at a medical facility.

Administering CPR techniques and dialing 911 have been the way to respond to sudden cardiac arrest for years, but the use of automated external defibrillators can more than double a victim's chance for survival.

In the not so distant past, only highly trained individuals in hospitals or EMS personnel had access to manual defibrillators. But technology has now made it possible for nonmedical personnel to perform defibrillation in nonmedical settings. AEDs equipped with an internal computer interpret the heart rhythm to determine if a victim is in ventricular fibrillation (v-fib), a potentially fatal heart rhythm. If v-fib is indeed occurring, the unit instructs the user to press an activation button that causes defibrillation. In cases when the heart is in full cardiac arrest with no sign of v-fib, only medications can restore heart movement.

## **Operation**

In a healthy heart, a natural “pacemaker” delivers organized electrical impulses that generate a steady repeating rhythm. When the heart goes into sudden cardiac arrest, random electrical impulses come from many locations within the heart simultaneously, causing an uneven heart rhythm. This uneven rhythm does not allow the chambers of the heart to fill and pump blood properly through the body. To restore a normal heartbeat, a defibrillator delivers a shock to the heart—momentarily stopping it—which interrupts the electrical chaos and helps restore a normal heartbeat.

Most AEDs operate in a similar manner. Two electrode pads are connected to the unit and the unit is activated. After a brief automatic internal check, the user can place the pads on the victim’s bare chest. The AED’s diagnostics determine whether defibrillation is required. If defibrillation is required, the unit instructs the user to clear the area around the victim and press an activation button. An AED delivers a 3000-volt charge in less than 0.001 of a second. That’s enough electricity to light a 100-watt bulb for 23 seconds. The unit then instructs the user to immediately begin CPR. After two minutes, the unit will perform another analysis to see if defibrillation is needed again.

Audible and/or visual prompts guide the user through the entire process so the possibility of error is very small. Studies indicate that AEDs are capable of accurately detecting v-fib and recommending a shock 90% of the time, and recommending no shock

99% of the time when not required. With this accuracy, an AED has a greater ability to diagnose v-fib than does an emergency response team.

Since an AED only restores a heart's normal beating pattern, CPR is also required. Rescue breathing and chest compressions are needed to supply oxygen to the victim if breathing and heartbeats are not occurring. After the prescribed sets of breaths/compressions, the unit will analyze the motionless victim and determine if a shock is necessary.

During treatment, the AED records the data it detects on the patient's condition. Some models can also record a live audio of the incident. This data can be transferred to the physician treating the patient when he/she arrives at the hospital.

## **Training**

AED manufacturers recommend users undergo training, which normally takes several hours. The [defibrillators](#) are so easy to use that most untrained users will be able to attach the pads, allowing the unit to analyze and provide shocks. However, users must still be taught when to use the AED, how to respond if a shock is not required and how to operate an AED safely.

## **Company Risk Factors**

Many large facilities such as airports, sports stadiums and large workplaces are installing AEDs to increase the chance of saving lives.

In order to evaluate whether your facility would benefit from an AED, consider the following: How many people are at your site? Large numbers of people increase the likelihood that an AED would need to be used. What is the response time of the local emergency response service to get to the furthest place on your site? Traffic conditions, elevators, stairs and gates can all cost valuable time to negotiate. What type of workforce or visitor demographics does your facility encounter? Consider the health, age, fitness and stress levels of the people. Are workplace hazards present such as electrical or confined spaces? Electrical

shock or asphyxiation could induce heart fibrillation. Is the facility in a remote area? Can an emergency response team reach these areas in time? Does your facility have an emergency response team already in place? If these teams are needed, it's a good bet an AED would be of use someday.

## **Automated External Defibrillator Programs**

An AED program is a natural extension of an existing first aid program. After purchasing a unit, you should contact your local hospital emergency department and consult with a physician. The physician is responsible for establishing appropriate policies and procedures for the use of the device. Specific requirements vary from state to state so it's important to discuss details with your AED supplier, physician or local American Heart Association, American Red Cross chapter or National Safety Council (NSC). Generally, programs contain the following topics:

- Periodic training and evaluation of the user on AED use, first aid and CPR
- Notifying the local EMS service of its presence and meeting their requirements
- Maintenance and regular testing of the AED according to manufacturer guidelines
- When emergency care is rendered to activate the EMS system
- Bloodborne pathogen training may also be required

## **Commonly Asked Questions**

**Q:** Is liability a concern with AED use?

**A:** The majority of states have "good samaritan" laws that protect persons rendering good faith emergency treatment with an AED from civil liability. Check with your state's regulations to see about your protection.

**Q:** Are there specific regulations regarding AEDs?

**A:** While there are some laws and regulations concerning AEDs at the federal level (e.g., FDA, Congress, etc.), most of the regulatory activity in the past few years centers on the state and local level, where a greater availability of AEDs is encouraged.

Most states allow a “Good Samaritan” exemption from liability for any individual who gives emergency treatment with a defibrillator. Here’s a link to a comprehensive discussion of [State Laws on Cardiac Arrest & Defibrillators](#).

**Q:** What is sudden cardiac arrest?

**A:** Sudden cardiac arrest occurs when the heart unexpectedly and suddenly stops beating normally. It is caused by abnormalities in the heart’s electrical system that cause the heart to twitch quickly and chaotically. While twitching, the heart is unable to pump blood to the brain and body. It is commonly called ventricular fibrillation.

**Q:** Is sudden cardiac arrest the same as a heart attack?

**A:** No. A heart attack is caused by blood flow blockage to the tissue of the heart, causing the tissue to die. Persons having heart attacks often feel pain in the chest, upper abdomen and arms. Others signs include nausea and sweating. During a heart attack, the heart does continue to beat and pump blood. During cardiac arrest, the heart stops beating and pumping blood.

**Q:** What is the average useful life of an AED?

**A:** Typically, the useful life of AEDs is 5 to 10+ years. Every five years or so, the American Heart Association (AHA) and European Resuscitation Council (ERC) issue new or refined guidelines for resuscitation and upgrades may be needed in the AEDs or the software in order to meet the new guidelines.

**Q:** Is maintenance required?

**A:** Some maintenance is required. Obvious maintenance would be replacing the non-rechargeable lithium- oxygen battery (LiO<sub>2</sub>), which is warranted for four years from the date of installation, and pad replacement (two-year shelf life). These units self-test on a daily, weekly, monthly and annual basis. There is some maintenance associated with these self-tests, especially if the test indicates a failure in some mode. Usually, one would check to see if the unit passed the self-test. There are also visual and audible alarms. It is suggested that the voice prompts be checked monthly. The procedure for the annual test is a bit more extensive: opening the unit, unplugging the pads, etc. The

protocols are given in the instructions.

(Rev. 6/2015)

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Source: Grainger Know How – <https://www.grainger.com/know-how>

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# Thermocouple Selection – Quick Tips

Thermocouples are temperature sensors. Different thermocouple types have different voltage output curves, so using the correct thermocouple type is essential to getting accurate measurements.

## Thermocouple Selection

Factors to consider when selecting the appropriate thermocouple for your application include: the original equipment thermocouple type, the application temperature, required length of service, required degree of accuracy, proper selection of extension wire type, chemical resistance of the thermocouple and/or sheath material and cost.

Be aware that large errors in measurements can occur if the proper

type of **extension wire** is not used. The extension wire is the wire that connects the thermocouple probe to the measuring element (meter, controller, receiver, recorder, etc.).

Thermocouples are identified by letter designation. Each letter type is designed for a specific temperature range and working environment. The most common types are J, K, T and E. Types R, S, C and GB are designed for high temperature applications. It is important to note that the working temperature range (and maximum temperature) can vary because it will depend on the diameter of the wire used in the probe, the material used for the probe and the probe coating material.

### **Thermocouple Probe Types**

**Penetration probes**: Penetration probes feature a high-strength casing and a pointed tip. This probe type is designed to penetrate semi-solid and hard substances. Penetration probes come in a variety of probe diameters, lengths, materials and temperature ranges.

**Air/gas probes**: The construction of this type features a probe/sensor enclosed by a shield. The shield is perforated allowing gas/air to flow into the sensor. When using an air/gas probe, make sure the probe materials are compatible with the gases present in the atmosphere you will be measuring.

**Surface probes**: Used to measure the temperatures of surfaces. The junction of the surface probe is flat, ensuring that the whole measuring surface remains in complete contact with the surface to be measured. These probes can be equipped with springs which will help the probe maintain constant contact with the surface or a sheath. There are a variety of surface probe types, some of which are: 90° angle, straight probes, flat-leaf probes and self-adhesive probes (for long-term measurements).

**Flexible insulated-wire probes**: Frequently used to measure the temperature of semi-solid materials or liquids. They come in a variety of sizes, materials and temperature ranges.

Many manufacturers offer specialty probes. These thermocouple

probes are designed for specific industries or applications. Some examples are:

**Food probes:** Penetration probes specifically designed to be easy to clean. They come in a variety of lengths, probe diameters, materials and cable lengths.

**HVAC probes:** These are a variation of air/gas probes designed for HVAC applications. These probes include hook-n-loop attachments (for piping and tubing), magnetic attachments (for flat surfaces) and longer cable lengths.

**Small-surface (electronics) probes:** Smaller diameter probes specifically designed for smaller openings/spaces often found in electronic applications.

**Scientific needle-tip probes:** Small diameter, needle-tip/hypodermic-tip probes for scientific applications where a smaller-scale probe is required.

Typically, the probes listed above are available in J, K and T types. Again, the temperature for the probe types can vary by manufacturer as it depends upon the wire diameter, probe material and probe coating material.

## **Commonly Asked Questions**

**Q: What is the probe sheath?**

**A:** A probe sheath is a tube that protects the thermocouple wires from chemical-rich atmospheres and high temperatures. A sheath is commonly found on thermocouple probes.

**Q: Is there a distance limitation on how far a thermocouple measurement/signal can be transmitted?**

**A:** The limit for an unamplified signal is about 200 ft. in an electrically clean (no interferences) environment. For transmitting over greater distances, use thermocouple extension wire.

**Q: How can I measure objects or samples if contact is not**

**permitted?**

**A:** In these instances use of an infrared thermometer should be considered.

### **Source**

[The Cole Parmer website](#) provides more information.

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Source: Grainger Know How – <https://www.grainger.com/know-how>

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# **Operation of Self-Propelled Equipment on Public Roadways Stats and Facts – Spanish**

## **HECHOS**

1. La mayoría de los accidentes relacionados con el equipo en la granja se deben a vuelcos de tractores agrícolas.
2. Otros se deben a:

- Atrapamiento con maquinaria en marcha
- Accidentes de transporte no de carretera (sin incluir los vuelcos)
- Colisiones en carretera entre maquinaria agrícola y otros vehículos
- Atropello por caída de piezas de maquinaria
- Equipos que entran en contacto con líneas eléctricas aéreas o subterráneas.

1. Las colisiones mortales entre tractores y vehículos de motor están aumentando en Estados Unidos por tres razones.

- Cada vez más personas se trasladan al campo y se desplazan a trabajar a pueblos y ciudades lejanas.
- Las carreteras rurales de dos carriles se han mejorado para permitir la conducción a alta velocidad. Estas mejoras hacen que las carreteras sean más seguras, pero la velocidad excesiva crea peligros como los descritos en este material, especialmente cuando las carreteras atraviesan comunidades agrícolas.
- Muchos agricultores poseen o alquilan tierras que no están conectadas a su explotación principal. Para llegar a esos terrenos, deben conducir sus equipos agrícolas por las carreteras públicas.

## ESTADÍSTICAS

- Los tractores y la maquinaria en su conjunto son la principal causa de accidentes mortales en la agricultura. Esto no ha cambiado en al menos 30 años, aunque el número total de muertes accidentales en la agricultura ha disminuido. Entre 2005 y 2014, de las 193 personas que murieron en la agricultura, 94 lo hicieron en accidentes relacionados con vehículos y maquinaria.
- Los tractores, los vehículos agrícolas y la maquinaria son responsables de casi la mitad de los accidentes mortales en las explotaciones agrícolas (el 49% de las muertes en las explotaciones).
- Según el Consejo Nacional de Seguridad, aproximadamente

15.000 vehículos agrícolas se ven implicados en accidentes de carretera cada año. Los estudios sobre las colisiones entre vehículos lentos y vehículos de motor concluyen que casi el 90% se producen en carreteras secas durante el día y que dos tercios son colisiones por detrás.

- Cuando se produce un accidente mortal, la víctima suele ser el operador del tractor.
- 

# Operation of Self-Propelled Equipment on Public Roadways

## Stats and Facts

### FACTS

1. Most equipment-related accidents on the farm are due to farm tractor rollovers.
2. Others are due to:
  - Caught in running machinery
  - Non-highway transportation accidents (not including rollovers)
  - Highway collisions between farm equipment and other vehicles
  - Struck by falling machinery parts
  - Equipment contacting overhead or underground power lines.
1. Deadly tractor/motor vehicle collisions are increasing in the United States for three reasons.
  - More people are moving to the country and commuting to work in distant towns and cities.
  - Two-lane rural roads have been improved to permit high-speed driving. These improvements make the roads safer, but excessive speed creates hazards like those described in

these materials, especially when highways run through farming communities.

- Many farmers own or lease land not connected to their main farm. They have to drive farm equipment on public roadways to reach this land.

## STATS

- Tractors and machinery collectively are the main cause of fatal accidents in agriculture. This has not changed in at least 30 years, though the total numbers of accidental deaths in agriculture has declined. Between 2005 and 2014, of the 193 people killed in agriculture 94 have been killed in farm related accidents involving vehicles and machinery.
  - Tractors, farm vehicles and machinery account for almost half of all fatal accidents on farms (49% of farm deaths).
  - According to the National Safety Council, approximately 15,000 farm vehicles are involved in highway crashes annually. Studies of collisions between slow moving vehicles and motor vehicles conclude that nearly 90 percent occur on dry roads during daylight hours and two thirds are rear-end collisions.
  - When a fatality occurs, the victim is usually the tractor operator.
- 

## Quick Course – Facilities Maintenance Safety

This quick courses covers the hazards associated with facilities maintenance and how to protect yourself including gear that protects you, hazard communication and more.

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# Blocking Raised Equipment Meeting Kit

## THE DANGERS

Every year workers die or are critically injured because the equipment they are working on does not have adequate blocking installed.

It involves the following scenarios

- raised blades of bulldozers.
- raised buckets of backhoes.
- raised boxes of dump trucks.
- raised forks of forklifts.
- punch presses.
- hoisting equipment.

It is critical to block all forms of hazardous energy including potential energy due to gravity, hydraulic pressure, or any stored energy that may cause equipment to move or drift, such as electrical or mechanical energy. The lack of blocking allows equipment to move or drop, striking workers, which could lead to fatal and critical injuries.

## TYPES OF BLOCKING APPARATUS

- Jack Stands
- Wheel Stands
- Blocks of Wood

# **BLOCKING EQUIPMENT IN A RAISED POSITION**

1. Do not work on top of, under, or work from mobile equipment in a raised position until the equipment has been blocked or mechanically secured to prevent it from rolling or falling accidentally.
2. Do not work on top of, under, or work from a raised component of mobile equipment until the component has been blocked or mechanically secured to prevent accidental lowering.
3. A raised component of mobile equipment is considered to be blocked or mechanically secured if provided with a functional load-locking device or a device which prevents free and uncontrolled descent.
4. Blocking or mechanical securing of the raised component is required during repair or maintenance of elevated mobile work platforms.

## **BEST BLOCKING PRACTICES – THE DO'S**

1. Review the complete Standard Operating Practices for every year or at the start of the season when you will be using this type of equipment.
2. Machines and equipment should be supported with the manufacturer's safety bracing system. If it is not available use solid wood blocking on solid work surfaces according to the manufacturer's instructions.
3. Block both sides of wheels on partially raised farm equipment with trailing wheels.
4. Turn off tractor engine and set brakes during maintenance work, unless otherwise indicated by manufacturer.
5. Freight should be blocked when loading or unloading a trailer. Do not use other freight as a block. Use proper materials for blocking.
6. Use larger blocks on the bottom. Make the platform as wide as possible.
7. Double-up and alternate the positioning of blocks while

building a platform.

## **ONE IMPORTANT DON'T**

- Don't rely on jacks, hoists or hydraulic systems to support raised equipment.

## **GENERAL WORK RULES**

- Do not slide wooden blocking through hands.
- Never stand on, place feet under or straddle blocking.
- When positioning blocking under a lift, use a hand-hook or bar if possible to properly place blocks ensuring your body parts are clear of pinch points. Use proper lifting techniques.
- When blocking a forklift, never place blocks under a counterweight to support unit.
- Place load across grain of the block. Never place load on the end of the block.
- Do not stack blocking more than 2 high creating an unstable condition. Stack to obtain desired height only.
- Blocking used in conjunction with jack stands should be kept to a minimum.

## **FINAL WORD**

Anyone who operates, cleans, services, adjusts or repairs machinery or equipment must be aware of the hazards associated with that machinery.

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# Blocking Raised Equipment Meeting Kit – Spanish

## QUÉ ESTÁ EN RIESGO

### LOS PELIGROS

Cada año, los trabajadores mueren o resultan gravemente heridos porque el equipo en el que trabajan no tiene instalado el bloqueo adecuado.

## CUÁL ES EL PELIGRO

Se trata de los siguientes escenarios

- cuchillas elevadas de las excavadoras.
- cubos elevados de retroexcavadoras.
- cajas elevadas de camiones volquetes.
- horquillas elevadas de carretillas elevadoras.
- prensas punzonadoras.
- equipos de elevación.

Es fundamental bloquear todas las formas de energía peligrosa, incluida la energía potencial debida a la gravedad, la presión hidráulica o cualquier energía almacenada que pueda hacer que el equipo se mueva o se desplace, como la energía eléctrica o mecánica. La falta de bloqueo permite que el equipo se mueva o se caiga, golpeando a los trabajadores, lo que podría provocar lesiones mortales y críticas.

## COMO PROTEGERSE

### TIPOS DE APARATOS DE BLOQUEO

- Soportes de gata
- Soportes de ruedas
- Bloques de madera

## **BLOQUEO DE EQUIPOS EN POSICIÓN ELEVADA**

1. No trabaje encima, debajo o desde equipos móviles en posición elevada hasta que el equipo haya sido bloqueado o asegurado mecánicamente para evitar que ruede o se caiga accidentalmente.
2. No trabaje encima, debajo o desde un componente elevado de un equipo móvil hasta que el componente haya sido bloqueado o asegurado mecánicamente para evitar su descenso accidental.
3. Un componente elevado de un equipo móvil está bloqueado o asegurado mecánicamente si está provisto de un dispositivo de bloqueo de carga funcional o de un dispositivo que impida el descenso libre e incontrolado.
4. Es necesario bloquear o asegurar mecánicamente el componente elevado durante la reparación o el mantenimiento de las plataformas de trabajo móviles elevadas.

## **MEJORES PRÁCTICAS DE BLOQUEO – LO QUE HAY QUE HACER**

1. Revise las Prácticas Operativas Estándar completas para cada año o al inicio de la temporada cuando vaya a utilizar este tipo de equipos.
2. Las máquinas y los equipos deben estar apoyados con el sistema de refuerzo de seguridad del fabricante. Si no se dispone de él, utilice bloqueos de madera maciza en superficies de trabajo sólidas de acuerdo con las instrucciones del fabricante.
3. Bloquee ambos lados de las ruedas en los equipos agrícolas parcialmente elevados con ruedas de arrastre.
4. Apague el motor del tractor y ponga los frenos durante los trabajos de mantenimiento, a menos que el fabricante indique lo contrario.
5. La carga debe bloquearse al cargar o descargar un remolque. No utilice otra carga como bloqueo. Utilice materiales adecuados para el bloqueo.
6. Utilice bloques más grandes en la parte inferior. Haga la plataforma lo más amplia posible.
7. Duplique y altere la posición de los bloques mientras

construye la plataforma.

### **ALGO IMPORTANTE QUE NO SE DEBE HACER**

- No confíe en los gatos, polipastos o sistemas hidráulicos para sostener el equipo elevado.

### **REGLAS GENERALES DE TRABAJO**

- No deslice los bloques de madera por las manos.
- No se ponga nunca encima, ni coloque los pies debajo, ni se siente a horcajadas sobre los bloques.
- Cuando coloque los bloques debajo de un elevador, utilice un gancho de mano o una barra, si es posible, para colocar correctamente los bloques, asegurándose de que las partes de su cuerpo estén libres de puntos de pellizco. Utilice técnicas de elevación adecuadas.
- Al bloquear una carretilla elevadora, nunca coloque los bloques debajo de un contrapeso para apoyar la unidad.
- Coloque la carga a través del grano del bloque. Nunca coloque la carga en el extremo del bloque.
- No apile los bloques a más de 2 alturas creando una condición inestable. Apilar sólo para obtener la altura deseada.
- El uso de bloques junto con soportes de gato debe ser mínimo.

## **CONCLUSIÓN**

Cualquier persona que opere, limpie, mantenga, ajuste o repare maquinaria o equipos debe ser consciente de los peligros asociados a dicha maquinaria. Todos los años mueren trabajadores o resultan gravemente heridos porque el equipo en el que trabajan no tiene instalado el bloqueo adecuado.

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# Blocking Raised Equipment Stats and Facts

## FACTS

1. Never rely on the jack or system that was used to lift or operate the load to securely support the load vehicle you are under.
2. Review the complete Standard Operating Practices for this work every year or at the start of the season when you will be using this type of equipment.
3. Machines and equipment should be supported with the manufacturer's safety bracing system. If it is not available, use solid wood blocking on solid work surfaces according to the manufacturer's instructions.
4. Freight should be blocked when loading or unloading a trailer. Do not use other freight as a block. Use proper materials for blocking.
5. Use larger blocks on the bottom. Make the platform as wide as possible.

## STATS

- 65 fatalities were attributed to pinning between the bucket and frame or between the loader lift arms and frame, but no loader type was identified. A number of these fatalities may have involved skid steer loaders.
- 37 work-related fatalities involving skid steer loaders. These fatalities resulted from the following types of incidents:
  - Pinning between the bucket and frame of the machine or between the lift arms and frame 29 (78%) of victims.
  - The 29 fatalities involving pinning between the bucket and frame or between the lift arms and frame resulted from the following activities:
    - 10 victims by working or standing under a raised loader

bucket

- 8 victims by leaning out of the operator's compartment into the path of the moving lift arms (pinned against frame)
- 5 victims by entering or exiting (pinned between bucket and frame)
- 20 work related fatalities involving skid steer loaders. Of these 20 fatalities, 14 (70%) involved pinning between the loader bucket and frame or between the lift arms and frame.

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# Blocking Raised Equipment Stats and Facts – Spanish

## HECHOS

1. Nunca confíe en que la gata o el sistema que se utilizó para elevar o manejar la carga, soporte de forma segura el vehículo de carga que tiene debajo.
2. Revise las Prácticas Operativas Estándar completas para este trabajo cada año o al inicio de la temporada en la que vaya a utilizar este tipo de equipos.
3. Las máquinas y los equipos deben estar apoyados con el sistema de arriostamiento de seguridad del fabricante. Si no se dispone de él, utilice bloqueos de madera maciza en superficies de trabajo sólidas de acuerdo con las instrucciones del fabricante.
4. La carga debe bloquearse al cargar o descargar un remolque. No utilice otra carga como bloque. Utilice materiales adecuados para el bloqueo.
5. Utilice bloques más grandes en la parte inferior.
6. Haga la plataforma lo más ancha posible.

# ESTADÍSTICAS

- 65 víctimas mortales se atribuyeron a pinzamientos entre la cuchara y el bastidor o entre los brazos de elevación de la cargadora y el bastidor, pero no se identificó ningún tipo de cargadora. Algunos de estos accidentes mortales pueden estar relacionados con minicargadoras.
- 37 víctimas mortales relacionadas con el trabajo en las que estaban implicadas las minicargadoras. Estas muertes se produjeron por los siguientes tipos de incidentes:
- Atoramiento entre la cuchara y el bastidor de la máquina o entre los brazos de elevación y el bastidor 29 (78%) de las víctimas.
- Las 29 víctimas mortales que se produjeron por pinzamiento entre la cuchara y el bastidor o entre los brazos de elevación y el bastidor se debieron a las siguientes actividades:
- 10 víctimas por trabajar o situarse debajo de la cuchara de la cargadora elevada
- 8 víctimas por asomarse desde el compartimento del operador a la trayectoria de los brazos de elevación en movimiento (atrapados contra el bastidor)
- 5 víctimas por entrar o salir (atrapadas entre la cuchara y el bastidor)
- 20 víctimas mortales relacionadas con el trabajo que implican a las minicargadoras. De estas 20 víctimas mortales, 14 (70%) se produjeron por pinzamiento entre la cuchara de la cargadora y el bastidor o entre los brazos de elevación y el bastidor.

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**Blocking      Raised      Equipment**

# Fatality File

In a New York case, a 38-year-old husband and father to five children was working as an HVAC technician at a hospital. He and a co-worker were tasked with removing a 28,450-pound chiller unit that had been cooling the hospital. In order to move the unit, chains were required to hoist it. As a result of inadequate chain usage, the chains hoisting the chiller broke during the transport, causing the chiller to fall on its side and pin our client against a wall. Tragically, he died as a result of his injuries.

The deceased plaintiff was 38 years old at time of death. The Plaintiff, widow of the decedent, was 34 years old when her husband died. The remaining plaintiffs were the five (5) surviving children of the decedent, who were ages 2, 5, 12, 15, and 17 at the time of their father's death.

## Description of Case

At the time of the accident, the decedent was employed as an HVAC Technician for a company that rented a chiller unit to a hospital in order to cool the hospital during the summer months. The chiller unit, which weighed 28,450 pounds, was transported to the site on a flatbed trailer and set up at the site by a separate contractor.

On December 4, 2012, the decedent and his co-worker were involved in the removal of the chiller system from the hospital site. This included removing the cribbing support system that had been erected under the chiller unit and 12,000-pound trailer to support the system so that the chiller and trailer structure would be level. A mechanical hoist was necessary to complete this work.

An employee hired by the separate contractor brought a boom truck with a connected hoist to the site. The boom truck that the employee brought was not equipped to hoist a chiller of that size and used chains that were not suitable for hoisting, only for tying down materials. During the hoisting of the chiller, the inadequate chain broke, causing the chiller to come crashing down,

fall to its side, and pin the decedent against a hospital wall.

The decedent was crushed, suffered injuries, and eventually died as a result.

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## **Blocking Raised Equipment Fatality File – Spanish**

En un caso de Nueva York, un marido de 38 años y padre de cinco hijos trabajaba como técnico de climatización en un hospital. A él y a un compañero se les encomendó la tarea de retirar una unidad de refrigeración de 28.450 libras que había estado refrigerando el hospital. Para mover la unidad, se necesitaban cadenas para izarla. Como resultado del uso inadecuado de las cadenas, éstas se rompieron durante el transporte, provocando que el enfriador cayera de lado y se clavara contra la pared. Trágicamente, murió a causa de sus lesiones.

El fallecido demandante tenía 38 años en el momento de la muerte. La demandante, viuda del fallecido, tenía 34 años cuando murió su marido. Los demás demandantes eran los cinco (5) hijos supervivientes del difunto, que tenían 2, 5, 12, 15 y 17 años en el momento de la muerte de su padre.

### **Descripción del caso**

En el momento del accidente, el fallecido trabajaba como técnico de calefacción, ventilación y aire acondicionado para una empresa que alquilaba una unidad de refrigeración a un hospital con el fin de enfriar el hospital durante los meses de verano. La unidad enfriadora, que pesaba 28.450 libras, fue transportada al lugar en un remolque de plataforma y montada en el lugar por un contratista independiente.

El 4 de diciembre de 2012, el fallecido y su compañero de trabajo

participaron en la retirada del sistema de refrigeración del hospital. Esto incluía retirar el sistema de soporte de cribado que se había erigido bajo la unidad de enfriamiento y el remolque de 12.000 libras para soportar el sistema, de modo que la estructura del enfriador y el remolque estuvieran nivelados. Fue necesario un elevador mecánico para completar este trabajo.

Un empleado contratado por el contratista independiente llevó al lugar un camión pluma con un polipasto conectado. El camión pluma que trajo el empleado no estaba equipado para elevar una enfriadora de ese tamaño y utilizaba cadenas que no eran adecuadas para elevar, sino sólo para atar los materiales. Durante la elevación del refrigerador, la cadena inadecuada se rompió, lo que hizo que el refrigerador se desplomara, cayera de lado y aprisionara al fallecido contra la pared del hospital.

El fallecido fue aplastado, sufrió lesiones y finalmente murió como consecuencia de ello.

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## Blocking Raised Equipment Picture This



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# Blocking Raised Equipment Picture This – Spanish



**Fuente:** <https://charlasdeseguridad.com.ar/>

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## Chocking Wheels Stats and Facts – Spanish

### HECHOS

1. Los casos en los que las ruedas no están bien sujetas han provocado catástrofes en el sector del transporte por carretera: lesiones o muertes que podrían haberse evitado

- con el uso adecuado de equipos de seguridad para remolques de tractores, como los calzos industriales para las ruedas.
2. Cuando se realizan correctamente, los calzos (o bloqueos) evitan que los camiones con remolque se desplacen o vuelquen mientras se cargan, descargan o realizan el mantenimiento.
  3. Los calzos son especialmente importantes en superficies irregulares o inclinadas.
  4. La FMCSA exige el uso correcto de los calzos de las ruedas de los camiones, incluyendo el uso de bloques o calzos para los camiones de transporte pesado, así como para los remolques que transportan productos agrícolas y madera para pulpa.

## ESTADÍSTICAS

- Un estudio de 2019 valoró la industria del transporte por carretera de Estados Unidos en 791.000 millones de dólares con más de 947.000 conductores de camiones empleados. Un estudio de la OSHA encontró que “los trabajadores de la industria del transporte por carretera experimentaron la mayor cantidad de muertes de todas las ocupaciones, representando el 11% de todas las muertes de trabajadores.”
- En 2020, la industria minera estadounidense vio cómo los accidentes mortales se cobraban la vida de 29 trabajadores. Los incidentes relacionados con los vehículos causan una gran parte de estos accidentes año tras año y ponen de manifiesto la necesidad de contar con equipos de seguridad minera adecuados, como calzos para las ruedas.
- En 2017, se registraron 270.000 lesiones en la industria del transporte y el almacenamiento. La misma industria también vio 819 muertes, un número sólo superado por la industria de la construcción. El número de lesiones laborales mortales evitables en el transporte y el almacenamiento creció un 5,3% de 2016 a 2017.<sup>1</sup>
- Más del 25% de todos los accidentes industriales ocurren en el muelle de carga, y por cada accidente, hay unos 600 casi accidentes.

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# Chocking Wheels Stats and Facts

## FACTS

1. Instances of wheels not being properly secured resulted in trucking catastrophes—injuries or fatalities that could have been avoided with proper use of tractor trailer safety equipment like industrial wheel chocks.
2. When performed correctly, chocking (or blocking) prevents tractor trailer trucks from rolling or overturning while being loaded, unloaded or serviced.
3. Chocking is especially important on uneven or sloped surfaces.
4. The FMCSA requires proper usage of truck wheel chocks including the use of blocks or chocks for heavy haulers, as well as trailers carrying agricultural commodities and pulpwood.

## STATS

- A 2019 study valued the U.S. trucking industry at \$791 billion with more than 947,000 truck drivers employed. An OSHA study found “workers in the trucking industry experienced the most fatalities of all occupations, accounting for 11 percent of all worker deaths.”
- In 2020, the U.S. mining industry saw fatal accidents claim the lives of 29 workers. Vehicle-related incidents cause a large portion of these accidents year after year and highlight the need for proper mining safety equipment, such as wheel chocks.
- In 2017, there were 270,000 injuries reported in the transportation and warehousing industry. The same industry also saw 819 deaths, a number only surpassed by the construction industry. The number of preventable fatal work

injuries in transportation and warehousing grew 5.3% from 2016 to 2017.<sup>1</sup>

- More than 25% of all industrial accidents happen at the loading dock, and for every accident, there are about 600 near misses.
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# Grain Bin Safety Meeting Kit

Grain bins are one of the biggest safety hazards for farmers who work in and around them. Serious and life-threatening dangers lurk throughout grain facilities, so it is imperative that farmers and workers are aware of these threats in order to protect themselves from serious injury and fatalities.

## GRAIN STORAGE/HAZARDS

The key to good grain storage is to put the highest quality grain into the bin, or bring it to the proper moisture condition as quickly as possible. Overall quality of stored grain always deteriorates, it is just a matter of how fast. Storing the grain longer than next spring requires much more vigilance in management.

- Remove all traces of old grain from combines, truck beds, grain carts, augers, and any other equipment used for harvesting, transporting, and handling grain. Even small amounts of moldy or insect-infested grain left in equipment can contaminate a bin of new grain.
- Rodents and pest problems are big issues with left over grain residue in bins and equipment / machinery.
- Inspect bins and foundations for structural problems. Uneven settlement of foundations can cause gaps between the foundation and bottom edge of the bin. This can result in grain spills and provide entry points for water, insects, and rodents.

## Engulfing and Suffocation Hazards

Engulfing and suffocation are major hazards. One of those being that bins have an opening in the center where grain is pulled from, so when the door is opened and grain is being pulled out, the grain on the inside is pulled down. Workers in the bins can become engulfed and suffocated in mere moments. Alternatively, if a worker is pulling grain that is vertically crusted inside the bin, this can cause an “avalanche” of grain that can also engulf and suffocate. Grain that is crusted on the surface can create holes underneath, called bridging; an unbeknownst farmer can climb into the bin without seeing these voids and fall under the surface.

Any time you enter a grain bin, be aware of constantly changing conditions and possible hazards – like lowered oxygen levels and toxic gases – all which can cause serious injury or death. Toxic gases can present themselves from fumigants that are used to prevent insect infestation while grain is stored in bins. It is recommended to wear appropriate respirators when the aforementioned situations cannot be avoided.

## HOW WORKERS SUFFOCATE – THREE WAYS

Workers can become caught or trapped in grain bins in three different ways: **the collapse of bridged grain, the collapse of a vertical wall of grain and engulfment in grain.** Moving or flowing grain is involved in all three.

## SAFETY TIPS

Whenever possible, don't enter a grain bin. If you must enter the bin, as a farm owner/operator you should:

- Break up crusted grain from the outside of the bin with a long pole. When using a pole, check to see that it doesn't come into contact with electric lines.
- Wear a harness attached to a properly secured rope.
- Stay near the outer wall of the bin and keep walking if the

grain should start to flow. Get to the bin ladder or safety rope as quickly as possible.

- Have another person, preferably two people, outside the bin who can help if you become entrapped. These people should be trained in rescue procedures and should know and follow safety procedures for entering the confined space.
- Grain fines and dust may cause difficulty in breathing. Anyone working in a grain bin, especially for the purpose of cleaning the bin, should wear an appropriate dust filter or filter respirator.
- Stay out of grain bins, wagons and grain trucks when unloading equipment is running.
- If it is necessary to enter the bin, remember to shut off the power to augers and fans. It is a good idea to lock out any unloading equipment before you enter a bin to prevent someone from unintentionally starting the equipment while you are in the bin.
- Children should not be allowed to play in or around grain bins, wagons or truck beds.
- Where possible, ladders should be installed inside grain bins for an emergency exit. Ladders are easier to locate inside a dusty bin if there are brightly painted stripes just above or behind the ladder.

## **SAFETY/QUESTION CHECKLIST**

- Has equipment been powered off at main disconnect and locked and tagged?
- If there is potential for combustible gas, vapors or toxic agents, has the oxygen level been tested with a gas monitor?
- Is a rope and harness available for anyone entering a grain bin?
- If a worker enters, is an observer present and in communication?
- Is the observer trained and able to initiate rescue?
- Is rescue equipment provided and specifically suited for entry?
- Are there NIOSH approved masks or respirators available?

- Are grain and feed bins clearly labeled to warn of the hazards of flowing grain or feed?
- Do all bins have permanent ladders inside and outside?
- Are hearing protectors available for wearing around noisy equipment?
- Are equipment guards and shields in place and in good condition?

## **FINAL EMPLOYEE SAFETY TIPS**

- Do not enter a bin when grain is flowing
- Do not enter a bin when you suspect carbon dioxide is present
- Shut off and secure all power sources before entering a grain bin
- Maintain protective guards on equipment
- Wear a dust mask
- Use correct fumigation procedures
- Be prepared for emergencies

## **FINAL WORD**

Preparing grain bins for harvest should be done to maintain the quality of grain and to make sure the areas around bins are ready for the busy season ahead. Simple maintenance and safety rules will make sure you don't experience any difficulties in the season ahead.