Night Vision Care and Terminology – Quick Tips

Introduction

Night vision products are comprised of image intensifier tubes and optics that amplify existing light to allow a person to see in conditions that are too dark for the naked eye. All night vision products work on the principle of collecting light energy (photons), converting that energy into electrical energy (electrons), multiplying the electrical energy and converting it back to light when the electrons strike a phosphor screen similar to a television.

Applications for night vision include:

- Security, to scan surroundings or property for intruders or illegal hunters
- Search and rescue, to spot lost people in low-light situations
- Natural disasters, to see when electrical power is out for extended periods
- Wildlife studies, to remain undetected while observing wildlife at night

Night Vision Generations

The term generation refers to a major advancement in technology regarding image quality and tube life.

Generation 0: This technology, while impressive in its time as the first night vision equipment, depended on an infrared light source to supplement available light to produce an image. These images were fuzzy and distorted and range was limited by the strength of the infrared source. The tube, which is the heart of any night vision system, generally lasted only a few hundred hours of use.

Generation 1: These devices use improved electronics to produce an image without the need for an external light source, but image

quality and tube life are still low. Generation 1 technology is found in most starlight or moonlight devices.

Generation 2: Devices marked a major improvement by introducing the micro-channel plate (MCP). The MCP is a glass disk with millions of microscopic holes to multiply and channel the electrons before they reach the phosphor screen. Light amplification for Generation 2 devices is typically 30,000 times.

Advanced night vision: Is not a separate generation, but rather a separate technology advanced by Bushnell that is comparable to Generation 2. Instead of using a micro-channel plate, fiber optic bundles eliminate distortion and noise to produce a high-resolution image.

Generation 3: Technology is even more sensitive by using gallium arsenide (GaAs) in the photocathode. This is the component responsible for converting photons to electrons, and the GaAs creates significantly more photoelectrons than with Generation 2. Light amplification for Generation 3 devices is typically 50,000 times.

Night Vision Terminology

Angle or field of view: The widest dimension of the circular viewing area seen through the device, often expressed in feet at 1000 yards distance.

Bright source: A bright source is an electronic circuit that turns the power down or off when exposed to light, thereby protecting the image intensifier.

Eyepiece focus: The focus used to match a night vision device to a persons specific eyesight.

Intensifier tube: These tubes amplify light to present a usable image.

Objective lens: Collects available light and focuses it on the image intensifier, along with providing magnification.

Phosphor screen: A green screen located at the back of the

intensifier tube. The phosphor screen makes the image become visible.

Photocathode: This component converts the photon energy into electrons to be amplified in the intensifier tube.

Night Vision Care and Maintenance

The most important point is to keep the device off in the light. Exposure to bright light can damage the components, and reduce the life span of those devices featuring a bright source protection. Though designed for use at night when humidity and dampness can be high, exposure to rain, fog or extended periods of high humidity can also damage these devices. Lenses should be cleaned similarly to those of a camera, and can easily be scratched if abrasive material is used. Cool, dry places are best for long-term storage.

Commonly Asked Questions

Q: Why don’t night vision devices have higher magnification?

A: Magnification results in a decrease in the amount of light available to amplify.

Q: How long do these devices last?

A: Providing there have not been exposures to light, intensifier tube life increases as the generation increases. Generation 0 and 1 products tend to last in the neighborhood of 400 hours, while the operational life of Generation 2 devices is around 5,000 hours, and Generation 3 devices have an ion coating on the MCP which increases life to 10,000 hours of use.

Q: Can these be used in total blackness?

A: No, night vision amplifies the small amount of existing light, so they require some light in order to operate.

Sources

Night Owl Optics®
Bushnell®

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General Hitching and Hauling Stats and Facts

FACTS

1. When most people attempt to hook a trailer to the back of their vehicle, they usually haven’t had any kind of professional training in doing so. The result is hitching a boat, trailer or car in a way that may not have been done correctly.
2. Each year, thousands of people are injured or killed in hitch and towing accidents. The cause is often negligent towing or a faulty hitch. Negligent towing includes vehicle owners who simply didn’t know what they were doing.
3. Often times a vehicle with a trailer is being driven by someone who is inexperienced driving with a trailer and makes a mistake maneuvering the vehicle and cargo in traffic.
4. In a car without a tow hitch receiver, the force of a rear-end collision is distributed through the back bumper and the

undercarriage of the vehicle. With a tow hitch in place, a rear-end collision impacts most or all the force of the impact on this protruding metal hitch. There's no resistance from the fender crumpling. This causes a higher amount of force through the frame increasing the amount of force that affects the driver and passengers.

5. Hitching and towing accidents can happen not only with an inexperienced driver in a station wagon but also with an experienced commercial driver of a semi-truck. Some reasons for this type of accident include:

- Excessive speed
- Failure to use safety chains
- Overweight cargo
- Steep declines
- Faulty brakes
- Defective trailer coupler
- Rusted components in trailer hitch
- Road conditions such as potholes
- Unexpected turns

STATS

- The National Highway Traffic Safety Administration (NHTSA) reports that around 50,000 hitch accidents occur every year. About 21,000 injuries were reported as caused by negligent towing or a faulty hitch. In the same year, an additional 450 fatalities were reported.
- According to the National Safety Commission, approximately 40 % of the vehicles on the road are equipped with a tow hitch receiver, which is part of the towing package that remains bolted onto the rear frame of the vehicle. Having this piece attached to your vehicle actually puts you at increased risk of injury if your vehicle is hit in a rear-end collision. The impact of this increased force can be unexpected and result in the following:
    - Increased risk of severe injury – With a tow hitch in place, occupants of the vehicle have a 22 % higher

risk of experiencing severe whiplash when hit from behind and are also at an increased risk of being thrown forward a further distance.

General Hitching and Hauling Stats and Facts – Spanish

HECHOS

1. Cuando la mayoría de las personas intentan enganchar un remolque a la parte trasera de su vehículo, normalmente no han recibido ningún tipo de capacitación profesional para hacerlo. El resultado es enganchar una embarcación, un remolque o un vehículo de una manera que puede no haberse hecho correctamente.
2. Cada año, miles de personas resultan heridas o muertas en accidentes de enganche y remolque. La causa suele ser un remolque negligente o un enganche defectuoso. El remolque negligente incluye a los propietarios de vehículos que simplemente no sabían lo que estaban haciendo.
3. Muchas veces un vehículo con remolque está siendo conducido por alguien que no tiene experiencia conduciendo con un remolque y comete un error al maniobrar el vehículo y la carga en el tráfico.
4. En un vehículo sin receptor de enganche de remolque, la fuerza de una colisión trasera se distribuye a través del parachoques trasero y los bajos del vehículo. Con un enganche de remolque colocado, una colisión trasera hace recaer la mayor parte o toda la fuerza del impacto en este enganche metálico que sobresale. No hay resistencia por parte de la arruga del guardabarros. Esto provoca una mayor cantidad de fuerza a través del bastidor aumentando la

cantidad de fuerza que afecta al conductor y a los pasajeros.

5. Los accidentes de enganche y remolque pueden ocurrir no sólo con un conductor inexperto en una camioneta, sino también con un conductor comercial experimentado de un semi – camión. Algunas de las razones de este tipo de accidentes son

- Velocidad excesiva
- No utilizar las cadenas de seguridad
- Sobrepeso de la carga
- Descensos pronunciados
- Frenos defectuosos
- Acoplamiento del remolque defectuoso
- Componentes oxidados en el enganche del remolque
- Condiciones de la carretera, como baches
- Giros inesperados

ESTADÍSTICAS

- La Administración Nacional de Seguridad del Tráfico en Carreteras (NHTSA) informa de que cada año se producen alrededor de 50.000 accidentes de enganche. Se informó de unas 21.000 lesiones causadas por un remolque negligente o un enganche defectuoso. Ese mismo año, se registraron otras 450 víctimas mortales.
- Según la Comisión Nacional de Seguridad, aproximadamente el 40% de los vehículos que circulan por la carretera están equipados con un receptor de enganche de remolque, que forma parte del paquete de remolque que permanece atornillado al bastidor trasero del vehículo. El hecho de tener esta pieza unida al vehículo supone un mayor riesgo de sufrir lesiones si el vehículo es golpeado en una colisión trasera. El impacto de este aumento de fuerza puede ser inesperado y dar lugar a lo siguiente
    - Mayor riesgo de lesiones graves: con un enganche de remolque colocado, los ocupantes del vehículo tienen un 22 % más de riesgo de sufrir un latigazo cervical grave cuando son golpeados por detrás y también corren

un mayor riesgo de salir despedidos hacia delante una distancia mayor.

General Hitching and Hauling Fatality File – Spanish

Un accidente de enganche mata a un niño

La víctima de 12 años era el sobrino del granjero. Había estado ayudando a empacar heno en la granja de 700 acres de su tío. Un remolque, sin frenos y apilado con balas de heno, estaba aparcado en lo que parecía ser un terreno llano, sin calzos para las ruedas.

El chico saltó del camión para enganchar la carreta mientras el granjero colocaba su camión de una tonelada en posición frente a ella. Cuando el chico levantó la lengüeta de la carreta, ésta rodó lentamente hacia delante. Al parecer, el niño no se dio cuenta de que su cabeza estaba directamente entre la plataforma metálica del camión y el borde del vagón. Es posible que estuviera demasiado ocupado intentando colocar el enganche en su sitio.

Cuando de repente el granjero no pudo ver al niño, fue a buscarlo. Encontró a su sobrino en un charco de sangre, desplomado sobre el enganche de la carreta, que se había clavado en el suelo. El niño murió al instante.

Cualquier vehículo sin frenos debe ser inmovilizado de alguna otra manera. Se pueden utilizar calzos o estacas en el suelo, o bien se pueden poner troncos o cadenas en las ruedas. El niño no debería haber estado entre los vehículos mientras el camión estaba en movimiento. Cualquier sistema que requiriera que el niño y el

agricultor estuvieran fuera de la vista del otro, aunque fuera un momento era demasiado peligroso.

General Hitching and Hauling Fatality File

Hitching Mishap Kills Child

The 12-year-old victim was the farmer’s nephew. He’d been helping bale hay on his uncle’s 700-acre farm. A wagon, without brakes and piled high with hay bales, was parked on what seemed to be level ground, without wheel chocks.

The boy jumped from the truck to hitch the wagon as the farmer reversed his one-ton truck into position in front of it. When the boy lifted the wagon’s tongue, the wagon slowly rolled forward. The boy apparently didn’t realize his head was directly between the truck’s metal bed and the wagon’s edge. He may have been too busy trying to drop the hitch into place.

When the farmer suddenly couldn’t see the boy, he went to find him. He found his nephew in a pool of blood, slumped over the wagon hitch, which had plowed into the ground. The boy died instantly.

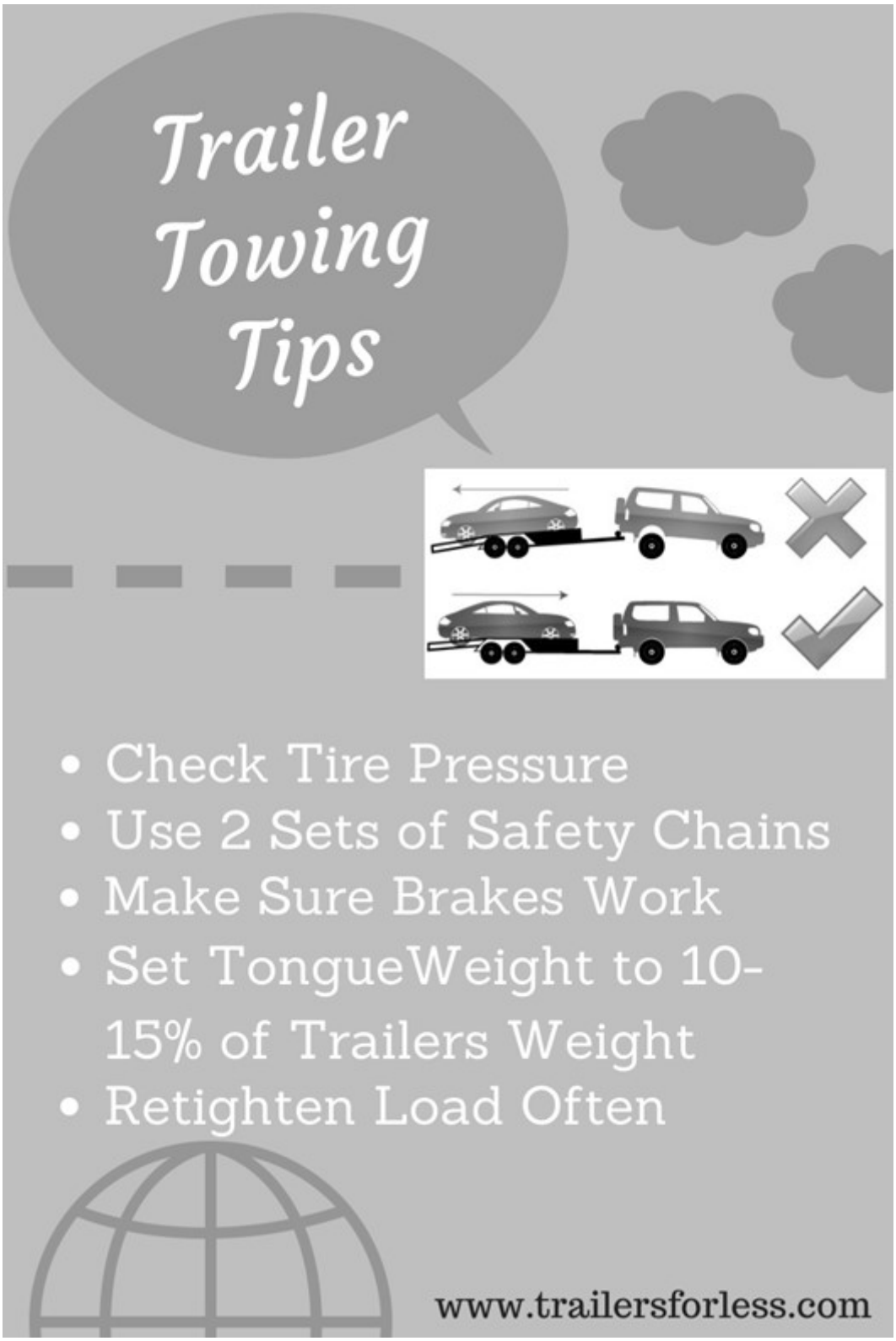
Any vehicle without brakes must be immobilized in some other way. Chocks or stakes in the ground can be used, or the wheels could be sprigged with logs or chains. The boy should not have been between the vehicles while the truck was moving. Any system that required the boy and the farmer to be out of each other’s sight for even a moment was too dangerous.

General Hitching and Hauling Picture This – Spanish



Fuente: ***https://www.autobild.es***

General Hitching and Hauling Picture This



Refuelling equipment Meeting

Kit

FIRE PREVENTION IS THE GOAL WHEN REFUELING

While it’s easy to let your refueling routine slip, it’s important to remain alert and aware of the dangers of refueling.

DANGERS OF REFUELING EQUIPMENT

- Improper fueling techniques can have deadly consequences. Vapors from these liquids can ignite with explosive force from no more than a spark.
- Fuel spills resulting from poor refueling procedures can cause needless damage to the environment.
- Inhalation of gasoline fumes can cause nausea, dizziness, headaches, and loss of coordination.
- Once ignited, fires from liquid fuels can be very difficult to extinguish, as they often spread quickly.

STATIC ELECTRICITY DANGER

It’s important to be aware of any source that could cause a spark or static electricity. Grounding the machine with a ground wire or dropping mounted equipment reduces the risk of static electricity. Remain still while refueling. Walking around, entering and exiting the machinery could result in a static charge build-up. Electronic devices, including cellphones or MP3 players, can also cause static electricity and shouldn’t be used when refueling. Open flames are also dangerous – items like cigarettes and butane torches need to be kept away from designated refueling areas. Exposing fuel to sparks, static electricity and open flames could result in explosions and fire.

KEY POINTS

- Know why liquid fuels can cause life-threatening situations and know how to prevent them.
- Take the time to learn about the fuels that you work with and know how to safely handle them.
- Respect the process of refueling—always work thoughtfully and carefully.
- Practice safe procedures when it comes to storing, handling, and dispensing the fuels that you use.
- Understand the importance of preventing and reacting to costly spills.
- Know how to respond to emergencies, such as fires or contamination, if they occur.
- Always adhere to OSHA regulations, which are in place to ensure a safe work environment.

BEST SAFE WORK REFUELING PRACTICES

In general, gloves and safety glasses must be worn by anyone administering fuel to equipment. **Here are some other helpful suggestions on how to foster a safe work environment and safe work practices.**

- Make sure stationary storage fuel tanks have proper ventilation and are well out of the way of buildings. If they are not buried, they should be grounded.
- Transport gasoline in a closed, vented container.
- Check tanks daily for leaks.
- Make sure static chain is attached.
- Keep the metal fill nozzle in contact with the lip of the tank so no static builds up.
- Don’t over-fill tanks.
- Utilize a three-point system when climbing on or off equipment.
- Refrain from smoking during the fueling process.
- Make sure there are no open fires or welding in the fueling zones.

- Equipment should be turned off prior to fueling equipment.
- Do not get on equipment until it has been shut off.
- Do not leave fuel pumping unattended.
- Wear proper fall protection.

FINAL WORD

Refueling happens so frequently that it is easy to get complacent about it. However, it must be remembered that diesel and gasoline are designed to cause explosions—hopefully within an engine.

Refuelling equipment Meeting Kit – Spanish

QUÉ ESTÁ EN RIESGO

LA PREVENCIÓN DE INCENDIOS ES EL OBJETIVO AL REABASTECER DE COMBUSTIBLE

Aunque es fácil dejar de lado la rutina de reabastecimiento de combustible, es importante mantenerse alerta y ser consciente de los peligros que conlleva el reabastecimiento.

CUÁL ES EL PELIGRO

PELIGROS DEL REABASTECIMIENTO DE EQUIPOS

- Las técnicas de reabastecimiento de combustible inadecuadas pueden tener consecuencias mortales. Los vapores de estos líquidos pueden inflamarse con fuerza explosiva con sólo una chispa.
- Los derrames de combustible resultantes de procedimientos de reabastecimiento deficientes pueden causar daños innecesarios al medio ambiente.
- La inhalación de los vapores de la gasolina puede provocar náuseas, mareos, dolores de cabeza y pérdida de coordinación.
- Una vez encendidos, los incendios provocados por los combustibles líquidos pueden ser muy difíciles de extinguir, ya que suelen propagarse rápidamente.

PELIGRO DE LA ELECTRICIDAD ESTÁTICA

Es importante estar atento a cualquier fuente que pueda causar una chispa o electricidad estática. Conectar la máquina con un cable de tierra o dejar caer el equipo montado reduce el riesgo de electricidad estática. Permanezca quieto mientras reabastece de combustible. Caminar, entrar y salir de la maquinaria podría

provocar una acumulación de carga estática. Los dispositivos electrónicos, incluidos los teléfonos móviles o los reproductores de MP3, también pueden provocar electricidad estática y no deben utilizarse al repostar. Las llamas abiertas también son peligrosas: artículos como los cigarrillos y los sopletes de butano deben mantenerse alejados de las zonas de reabastecimiento de combustible. La exposición del combustible a las chispas, la electricidad estática y las llamas abiertas puede provocar explosiones e incendios.

COMO PROTEGERSE

PUNTOS CLAVE

- Conozca por qué los combustibles líquidos pueden provocar situaciones de riesgo para la vida y sepa cómo prevenirlas.
- Tómese el tiempo necesario para conocer los combustibles con los que trabaja y sepa cómo manipularlos de forma segura.
- Respete el proceso de reabastecer de combustible: trabaje siempre de forma reflexiva y cuidadosa.
- Practique procedimientos seguros a la hora de almacenar, manipular y dispensar los combustibles que utiliza.
- Comprenda la importancia de prevenir y reaccionar ante los costosos derrames.
- Sepa cómo responder a las emergencias, como los incendios o la contaminación, si se producen.
- Cumpla siempre la normativa de la OSHA, que está en vigor para garantizar un entorno de trabajo seguro.

MEJORES PRÁCTICAS DE REABASTECIMIENTO DE SEGURIDAD EN EL TRABAJO

En general, cualquier persona que administre combustible a los equipos debe llevar guantes y gafas de seguridad. **A continuación, se ofrecen otras sugerencias útiles sobre cómo fomentar un entorno de trabajo seguro y prácticas de trabajo seguras.**

- Asegúrese de que los tanques de combustible de almacenamiento estacionario tengan una ventilación adecuada y estén bien alejados de los edificios. Si no están enterrados, deben estar conectados a tierra.

- Transporte la gasolina en un contenedor cerrado y ventilado.
- Compruebe diariamente que los tanques no tengan fugas.
- Asegúrese de que la cadena estática está conectada.
- Mantenga la boquilla metálica de llenado en contacto con el borde del tanque para que no se acumule estática.
- No llene los depósitos en exceso.
- Utilice un sistema de tres puntos cuando suba o baje del equipo.
- No fume durante el proceso de llenado de combustible.
- Asegúrese de que no hay fuegos abiertos ni soldaduras en las zonas de repostaje.
- Los equipos deben estar apagados antes de abastecerse de combustible.
- No se suba al equipo hasta que se haya apagado.
- No deje el bombeo de combustible sin vigilancia.
- Utilice una protección contra caídas adecuada.

CONCLUSIÓN

El reabastecimiento de combustible es tan frecuente que es fácil caer en la complacencia. Sin embargo, hay que recordar que el diésel y la gasolina están diseñados para provocar explosiones, a ser posible dentro de un motor.

Refuelling equipment Stats and Facts – Spanish

HECHOS

1. Los derrames de combustible resultantes de un mal procedimiento de reabastecimiento pueden causar daños innecesarios al medio ambiente.
2. La inhalación de los vapores de la gasolina por un reabastecimiento inadecuado puede provocar náuseas, mareos, dolores de cabeza y pérdida de coordinación.
3. Una vez encendidos, los incendios de combustibles líquidos

pueden ser muy difíciles de extinguir, ya que se propagan rápidamente.

4. Los peligros que conlleva el repostaje de equipos en una obra incluyen incendios de gas y combustible, derrames, vapores y resbalones, tropiezos y caídas.
5. Las técnicas de abastecimiento de combustible inadecuadas, o un motor que se deja en marcha pueden causar un incendio, una explosión o un derrame.
6. Fumar mientras se carga el combustible puede provocar un incendio o una explosión.
7. El llenado de recipientes no homologados puede dar lugar a una carga de electricidad estática que provoque un incendio o una explosión.
8. El uso de mangueras, bombas o boquillas en mal estado puede provocar un incendio o una explosión.
9. La gasolina derramada sobre el cuerpo durante un tiempo prolongado puede causar quemaduras graves.

ESTADÍSTICAS

- La mayoría de las muertes relacionadas con el propano son el resultado de quemaduras graves provocadas por un incendio de propano. Las operaciones de reabastecimiento de combustible y las reparaciones de los equipos de propano suelen ser las causas más comunes de las lesiones relacionadas con el propano, aunque la exposición al propano o al monóxido de carbono que se libera cuando el propano arde también puede ser una fuente de lesiones.
- El 87% de los incendios se produjeron cuando el abastecedor regresó al vehículo durante el proceso de reabastecimiento y tocó la boquilla después de salir del vehículo.
- El 39% de los informes describen incendios antes de que comience el proceso de reabastecimiento, cuando el abastecedor tocó el tapón de gasolina o la zona cercana a éste después de salir del vehículo.
- El 32% de los incendios no implican ninguna de estas dos situaciones de hecho.
- El 61% de los incidentes de incendios en gasolineras tienen

que ver con incendios de vehículos.

Refuelling equipment Stats and Facts

FACTS

1. Fuel spills resulting from poor refueling procedures can cause needless damage to the environment.
2. Inhalation of gasoline fumes from improper refueling can cause nausea, dizziness, headaches, and loss of coordination.
3. Once ignited, fires from liquid fuels can be very difficult to extinguish, as they spread quickly.
4. The hazards involved with fueling equipment on a construction site include gas and fuel fires, spills, vapors and slips, trips and falls.
5. Improper fuelling techniques, or an engine left running may cause a fire, explosion, or a spill.
6. Smoking while fuelling can cause a fire or explosion.
7. Filling unapproved containers can result in static electricity charge, resulting in a fire or explosion.
8. Using improperly maintained hoses, pumps or nozzles can cause a fire or explosion.
9. Gasoline spilled on the body for a prolonged time can cause severe burns.

STATS

- The majority of propane-related deaths are the result of severe burns from a propane fire. Tank-refueling operations and repairs to propane equipment tend to be the most common

causes of propane-related injuries, though exposure to propane or carbon monoxide released when propane burns can also be a source of injuries.

- 87% of fires occurred when the fueler returned to the vehicle during the refueling process and then touched the nozzle after leaving the vehicle.
- 39% of reports described fires before the refueling process began, when the fueler touched the gas cap or the area close to it after leaving the vehicle.
- 32% of fires do not involve either of these two fact situations.
- 61% of gas station fire incidents involve vehicle fires.

Refuelling equipment Fatality File – Spanish

Un hombre muere en una explosión de un tanque de combustible

TENSAS PARISH, La. – Según los diputados del jefe de Bomberos del Estado, han concluido su investigación sobre la causa de la explosión de un tanque de combustible que se cobró la vida de un operador de camión dispensador.

Según los diputados del SFM, el 29 de diciembre de 2020 alrededor de las 2:00 PM, el equipo de Protección contra Incendios del Distrito # 1 de Tensas respondió a un informe de una explosión fuera de Hogue Road en Newellton. Los bomberos dicen que llegaron a la escena donde un tanque de combustible había explotado, matando al operador e incendiando un camión de pasajeros, así como la maquinaria cercana.

Las autoridades dicen que la identificación oficial está pendiente

de la autopsia de la Oficina del Forense de Tensas Parish, sin embargo, se cree que la víctima es un hombre de 56 años de Newellton.

Tras investigar el lugar y revisar los vídeos de vigilancia, los investigadores determinaron que la explosión se produjo mientras la víctima cargaba de combustible un tanque de la propiedad que se utilizaba para alimentar equipos de construcción. La causa oficial del incendio sigue siendo indeterminada, aunque los investigadores de la SFM no pueden descartar una ignición por electricidad estática del combustible mientras se estaba dispensando.

Las autoridades dicen que les gustaría recordar a todos los residentes de Luisiana que coloquen los contenedores de combustible en el suelo cuando los rellenen, ya que esto puede reducir el peligro potencial de la electricidad estática. Además, también quieren aconsejarles que eviten fumar o utilizar dispositivos electrónicos mientras reabastecen los vehículos y/o los contenedores.

Refuelling equipment Fatality File

Man Dies in Fuel Tank Explosion

TENSAS PARISH, La. – According to State Fire Marshal deputies, they've concluded their investigation into the cause of a fuel tank explosion that claimed the life of a dispensing truck operator.

Per the SFM deputies, on December 29, 2020 around 2:00 PM, the District #1 Tensas Fire Protection team responded to a report of an explosion off of Hogue Road in Newellton. Firefighters say they

arrived on scene where a fuel tank had exploded, killing the operator and setting fire to a passenger truck as well as nearby machinery.

Authorities say official identification is pending autopsy by the Tensas Parish Coroner’s Office, however, the victim is believed to be a 56-year-old man from Newellton.

After investigating the scene and reviewing surveillance video, investigators determined the explosion occurred while the victim was fueling a tank on the property which was being used to power construction equipment. The official cause of the fire currently remains undetermined, although SFM investigators are unable to rule out a static electricity ignition of the fuel as it was being dispensed.

Authorities say they would like to remind all Louisiana residents to place fuel containers on the ground when refilling them as this can reduce the potential danger of static electricity. In addition, they also would like to advise you to avoid smoking or using electronic devices while refueling vehicles and/or containers.

Refuelling equipment Picture This



Source: ***https://www.turfassistant.com***

Refuelling equipment Picture This – Spanish



Fuente: ***https://www.quironprevencion.com/***

Pre-Operational Inspection of Equipment Fatality File – Spanish

Según la cadena de televisión CBS Boston, un hombre de 47 años murió mientras trabajaba después de que su equipo fallara durante una inspección de un tanque de agua de la ciudad en Braintree, Massachusetts, el jueves.

David Scott, de 47 años, estaba realizando una inspección en el interior de un depósito de agua municipal de 150 pies cuando se produjo la tragedia. Alrededor de las 10 de la mañana, hora local, Scott informó a su observador de un problema de suministro de aire en la parte superior del tanque. Mientras la tripulación esperaba la llegada del personal de rescate, el observador saltó al interior del tanque para salvar a Scott.

Sin embargo, debido a las gélidas condiciones meteorológicas y al agua fría, el observador también quedó atrapado en el agua a 45 grados. Según la CBS Boston, los equipos de rescate pudieron sacar del tanque al observador, que estaba entumecido y tenía poca fuerza. El hombre fue trasladado al hospital y tratado por lesiones que incluían hipotermia.

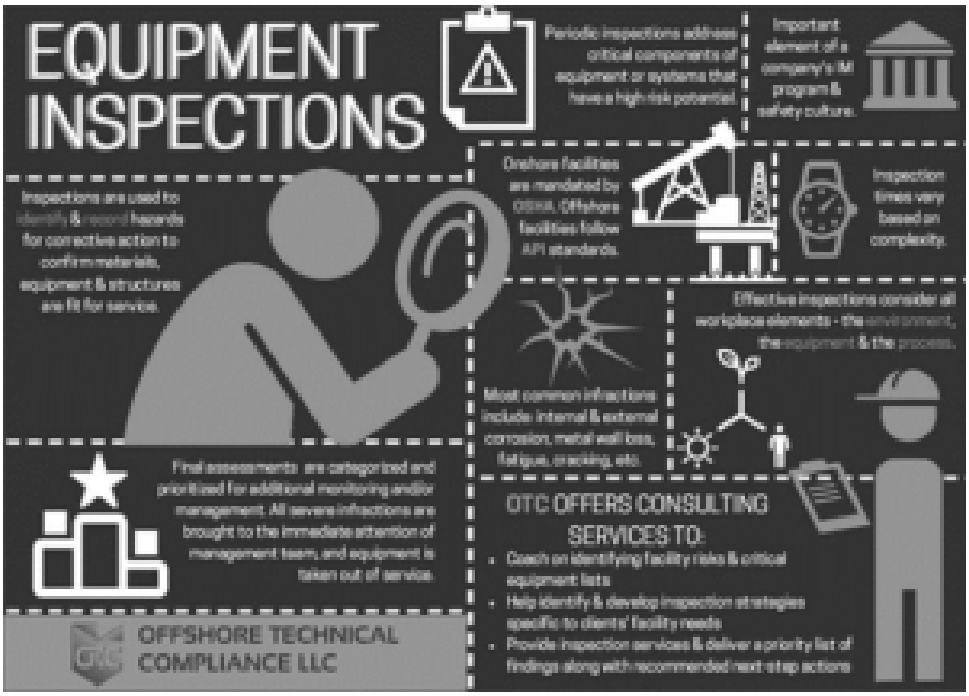
CBS Boston informa de que los equipos no pudieron salvar a Scott, que falleció dentro del tanque. Los equipos decidieron vaciar el tanque de un millón de galones para recuperar su cuerpo, un esfuerzo que duró unas 16 horas.

Scott, el observador y otro miembro de la tripulación en tierra formaban parte de la empresa T.K. Potable Diving of Texas, subcontratistas contratados por Pittsburg Tank & Tower Co., que la ciudad de Braintree tiene contratada. CBS Boston informa de que esta última organización sólo había cometido una infracción de seguridad “grave” en los últimos 10 años.

Los investigadores de la Administración de Seguridad y Salud Ocupacional (OSHA) estaban en el lugar. Los funcionarios de la

ciudad afirman que el accidente no supone una amenaza para el suministro municipal de agua.

Pre-Operational Inspection of Equipment Picture This



Source: *https://otcompliance.com*

Pre-Operational Inspection of Equipment Picture This – Spanish



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

Chain Saw Safety – Quick Tips

Chain saws are one of the most widely used power tools at home and in the workplace. They also have the potential to be among the most lethal. Whether it be the weekend warrior cutting firewood or a professional logger clearing land, proper personal protective equipment (PPE), training and technique are the keys to preventing injuries

Most chain saw injuries involve contact with the cutting chain, which results in severe injury to the hands, legs, feet and head. Preventing such injuries in the workplace requires a joint effort on the part of both employee and employer. Employees should use proper personal protective equipment, chain saws with the latest

safety equipment and proper techniques when cutting. Employers must provide chain saw safety training and supervision.

Chain Saw Safety Training and Supervision

Chain saw operators must receive training. The most effective training includes a combination of classroom and hands-on instruction. Depending on the experience of the chain saw operator, training should include instruction on:

- safe working techniques
- basic information about the chain saw, components, design and limitations
- stopping and starting
- cleaning and servicing
- kick back prevention
- chain sharpening
- PPE use and limitations

General Chain Saw Safety Precautions

Before using a chain saw it is important to read the owners manual and familiarize yourself with safe operation. Giving a chain saw to an inexperienced worker without proper training is an injury waiting to happen. Before each use, check that:

- chain saw is in good general condition (no leaks or damage)
- the throttle, safety throttle lock and stop switch operate correctly
- the chain brake works
- the chain is lubricated, sharp and tensioned correctly
- the sprocket and bar are in good condition
- the idle is properly adjusted

When starting a chain saw, it should always be started on the ground or a well supported and stable surface. Drop starting a chain saw is dangerous and prohibited by OSHA. A drop start is done by thrusting the saw down with your left hand and pulling the starter cord up with your right hand.

When refueling a chain saw:

- avoid smoking
- be at least 10 ft (3m) from any open flame or other ignition source
- choose a clean area
- refuel only after the motor has cooled
- wipe off any fuel that spilled on to the saw
- use safety cans to store fuel
- keep a fire extinguisher or shovel nearby

The chain saw must be shut down whenever a saw is carried. Whenever possible use the bar cover. A saw should be carried by its front handle with the chain bar pointing to the rear. Do not carry the chain saw on your shoulder. If you lose your balance, you will not be able to use your arm to break your fall. After completing work, the following maintenance needs to be completed:

- clean the saw, especially the air filter, cooling inlets and sprocket
- reverse chain bar, top to bottom, to prevent wear and burring
- clean chain brake
- clean out chain bar groove
- sharpen saw chain

Chain Saw Kickback

Kickback occurs when the upper portion of the tip comes in contact with another object or the chain is pinched in a cut. As a result the chain saw will violently jump or kick back towards the operator. To prevent kickback injury the following precautions should be taken:

- buy chain saws with or install chain brake (preferably inertia activated)
- check brake mechanism before each use for effective operation
- use a low kickback chain (meets American National Standards Institute B175.1-1991 Safety Requirements for Gasoline Powered Saws)
- sharpen the saw chain frequently; a sharp saw chain is safer

than a dull one (if wood shavings become dusty the chain is dull and needs to be sharpened)
- hold chain saw firmly
- check chain tension
- never bend over the saw, if you stand up straight and to the left of the bar any kickback should go over your right shoulder
- wear protective equipment -especially head protection and chain saw chaps or leggings
- don't cut above shoulder height
- never hold saw with one hand or by one handle
- always begin the cut at peak revs
- clear brush and debris from area

PPE Selection and Use

To minimize injury, workers need proper safety equipment. *(29 CFR 1910.266)* The equipment listed below must be worn at all times during chain saw activities:

Hand Protection – Hand protection, which provides adequate protection from puncture wounds, cuts and lacerations must be provided. *(29 CFR 1910.266 (d)(1)(iii))*

Hard Hat – All hard hats must meet ANSI standards Z89.1-1989 or Z89.2-1971 for impact protection. High visibility colors are suggested. *(29 CFR 1910 Subpart I)*

Safety Glasses and Face Shields – Safety glasses are considered to be primary protection and must be worn when eye injury is possible. Proper safety eyewear will meet ANSI Z87.1-1989. Face shields may be worn to protect the face from wood chips and other small objects. However, face shields are secondary protection and safety glasses or goggles (primary protection) must be worn. *(29 CFR 1910.266 (d)(1)(vii)(A)&(B))*

Hearing Protection – There are many types of hearing protection, such as foam plugs, ear muffs and hearing bands. All the different types provide excellent hearing protection. When choosing hearing protection, you should look for the NRR (Noise Reduction Rating).

This number refers to the amount of noise the hearing protection will reduce the surrounding work environment. In general, the higher the NRR the better. The type of hearing protection (ear plug, ear muff or ear cap) that works best depends upon the preference of the worker.

Leg Protection – To prevent injury to the legs, special chaps or leggings should be worn. The most common types are made of Kevlar™ or ballistic nylon. When choosing protective clothing, look for equipment which meets American Pulpwood Association (APA) guidelines. *(29 CFR 1910.266 (d)(1)(iv))*

Safety Footwear – When choosing proper footwear make sure the footwear is Z41-1991 compliant. Shoes that meet this standard have been tested for both impact and compression resistance. In addition, footwear may also provide special protective qualities such as being conductive, metatarsal protection, electrical hazard protection or puncture resistance. All footwear meeting the ANSI specifications will be marked with what portion of the standard it complies with. In addition, American Society for Testing and Materials (ASTM) has recently published F1818, Standard Specifications for Foot Protection for Chain Saw Users. This standard has specific criteria for footwear intended to minimize foot injuries caused by accidental contact with a running chain saw. *(29 CFR 1910.266 (d)(1)(v))*

First Aid – First-aid kits should be provided at each worksite where trees are being cut, at each active landing and on each employee transport vehicle. Among the criteria is that each kit should be based on the number of employees and the hazards anticipated. *(29 CFR 1910.266 (d)(2)(i))*

Sources

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www.ANSI.org
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Source: Grainger Know How – https://www.grainger.com/know-how

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Emergency Spill Response – Quick Tips

Emergency spill response is an important part of a company's safety, health and environmental program. Well-prepared companies have a plan of action and keep the appropriate cleanup supplies on hand.

OSHA's Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) includes all employees who are exposed or potentially exposed to hazardous substances – including hazardous waste – and who are engaged in one of the following operations as specified by 29 Code of Federal Regulations (CFR) 1910.120(a)(1)(i-

v) and 1926.65(a)(1)(i-v):

- Cleanup operations required by a governmental body, whether federal, state, local or other, involving hazardous substances that are conducted at uncontrolled hazardous waste sites
- Corrective actions involving cleanup operations at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA) as amended (42 U.S.C. 6901 et seq.)
- Voluntary cleanup operations at sites recognized by a federal, state, local or other governmental body as uncontrolled hazardous waste sites
- Operations involving hazardous wastes that are conducted at treatment, storage and disposal facilities regulated by Title 40 CFR Parts 264 and 265 pursuant to RCRA, or by agencies under agreement with U.S. Environmental Protection Agency to implement RCRA regulations
- Emergency response operations for releases of, or substantial threats of releases of, hazardous substances regardless of the location of the hazard

This document focuses on emergency response operations for releases or potential releases of hazardous substances regardless of the location of the hazard by HAZWOPER trained responders. A simplified spill response plan might look like this:

1. Evacuate personnel from the immediate area of the spill
2. Identify the spilled material(s)
3. Notify the spill response team
4. Barricade the spill area and notify others in surrounding areas
5. Extinguish or disconnect all sources of ignition and contact the fire department if the chemical is flammable
6. Don the appropriate personal protective equipment
7. Contain the spill
8. Clean up the spill
9. Dispose of the spill in accordance with local, state and federal regulations

When putting together spill containment supplies, anticipate the

types of spills and consider the types and styles of sorbents needed as well as the “tools” that should be readily available. Spill containment tools can include drain protectors, drain plugs, drum plugs, chemical neutralizers and shovels, brooms, mops, etc. If working with flammables, non-sparking tools are suggested.

Sorbent Forms

Booms are cylindrical and vary in length and width. They are used to help control and contain spills. Some booms contain spills on water, and can be connected together and deployed onto the water as a large spill barrier.

Socks or mini booms are cylindrical and vary in length and width. This form of sorbent is typically used in facility spill response or maintenance applications. Socks can be used to contain spills or can be placed around machinery or other equipment to contain leaks.

Pillows are rectangular and filled with sorbent media. They are used to clean up medium-sized spills. They can be placed under drip pans to help eliminate overflow problems, or used as a precaution for a possible spill when transferring liquids.

Pads and sorbent rolls are flat, sorbent sheets available in unperforated rolls, perforated rolls or manufactured to a specific size, up to 300 feet long. Pads can be used to line shelves, catch leaks under machinery and clean up spills. Rolls can be cut to specific lengths for larger applications.

Loose or particulate sorbents are composed of sorbent media that is not contained in any type of skin. Application of loose sorbents depends on the type of sorbent media used. Loose sorbents are typically used on small spills.

Sorbent Categories

The three categories of sorbents are universal, petroleum and maintenance. These categories are made up of several sorbent materials, including synthetics, such as polypropylene; inorganic materials, such as expanded silicates and clay; and organic

materials, such as cellulose and wood fibers.

Universal sorbents are designed to absorb any liquid. They will absorb aggressive liquids, such as acids and bases as well as non-aggressive liquids and solvents, such as cleaners, water-based fluids, gasoline and alcohols. Universal sorbents are made of surfactant-treated polypropylene or expanded silicate materials. When cleaning up hydrofluoric acid, do not use an expanded silicate absorbent because the expanded silicate material will react with the hydrofluoric acid and generate heat. Instead, use a sorbent made of polypropylene.

Petroleum sorbents or “oil-only sorbents” are designed for absorption of oil and/or petroleum-based liquids. These sorbents are hydrophobic, meaning they will not absorb water or water-based liquids. These can be deployed on water surfaces for emergency cleanup of spills, or used in maintenance applications for hydraulic and engine-oil cleanup. Petroleum sorbents are made of polypropylene or treated cellulose.

Maintenance sorbents absorb non-aggressive liquids commonly found in manufacturing/maintenance operations. These liquids include coolants, lubricants, oils and cutting fluids. Maintenance sorbents will pick up both water-based and oil-based fluids. These sorbents are typically made of recycled materials, such as cotton, wool, cellulose or corncob. They can also be made of polypropylene or a combination of the materials listed above.

Sorbent Capacity

Sorbent capacity can be listed by the amount of weight absorbed in relation to itself (e.g., absorbs 12 times its weight) or by its liquid capacity (e.g., absorbs 8 gallons). If a boom weighs 1 pound and absorbs 12 times its weight, it will absorb 12 pounds of fluid. However, since all liquids don’t weigh the same per gallon, the weight capacity of the sorbent actually varies from liquid to liquid. So perhaps a more accurate way to assess sorbent capacity is by how many gallons it will absorb, or its liquid capacity. This amount will remain fairly static, regardless of the fluid weight. A boom that’s 4 feet long and 3 inches in diameter will

typically absorb 1 to 1.25 gallons of liquid. A pad that measures 16 inches by 20 inches and is 3/16ths of an inch thick will absorb 28 to 32 fluid ounces. Both of these examples are for polypropylene sorbents. Other materials may have different sorbent capacities.

Sources

29 CFR 1910.120, Hazardous Waste Operations and Emergency Response

U.S. EPA National Response Center

Frequently Asked Questions

Q: Are there specific training requirements for personnel who respond to spills?

A: Yes. These requirements are found in three areas of 29 CFR 1910.120:

- 29 CFR 1910.120(e)(1) through (e)(9) describes in detail the training requirements for all employees exposed on site to hazardous substances, health hazards, or safety hazards. Training is broken down into general, initial, management and supervisor, qualifications, certifications, emergency response and refresher training.
- Training for work at treatment, storage and disposal facilities is described in 29 CFR 1910.120(p)(7)(i) through (p)(7)(iii) – 24 hours of initial training and eight hours of annual retraining are required.
- Emergency responder training to hazardous substance releases is covered under 29 CFR 1910.120(q)(6) through (q)(8)(ii). There are five levels of training, and the levels are progressive.

Q: How should I properly dispose of sorbents that are saturated with chemicals?

A: The handling, storage and disposal of these materials are governed by local, state and/or federal environmental regulations. Section 13 of the safety data sheet (SDS) can be referenced for

disposal considerations. It is the end user's responsibility to comply with the respective regulations.

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

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Containment and Secondary Containment Requirements – Quick Tips

Introduction

The Environmental Protection Agency (EPA) addresses containment and secondary containment systems in the Resource Conservation and Recovery Act (RCRA) found in Title 40 Code of Federal Regulations (CFR) Part 264.

The EPA refers to the need for containment and secondary containment in two different areas. Subpart I, Use and Management of Containers (40 CFR 264.175), which covers portable storage containers, such as 55-gallon drums, for hazardous waste, and the second in Subpart J, Tank Systems (40 CFR 264.193), which covers

large stationary containers, such as tank systems, for hazardous waste.

Hazardous Materials and Hazardous Wastes

According to the Institute of Hazardous Materials Management a hazardous material is any item or agent (biological, chemical, radiological, and/or physical), which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors.

Hazardous materials are defined and regulated in the United States primarily by laws and regulations administered by the EPA, Occupational Safety and Health Administration (OSHA), Department of Transportation (DOT), and Nuclear Regulatory Commission (NRC). Each has its own definition. OSHA defines a hazardous chemical as any chemical which is classified as a physical hazard or a health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified. EPA incorporates the OSHA definition, and adds any item or chemical which can cause harm to people, plants, or animals when released by:

- Spilling,
- Leaking,
- Pumping,
- Pouring,
- Emitting,
- Emptying,
- Discharging,
- Injecting,
- Escaping,
- Leaching,
- Dumping, or
- Disposing into the environment.

EPA: Portable Containers

The EPA does not use the term “secondary containment” when addressing portable containers. Instead, they refer only to containment under 40 CFR 264.175(b). It says that a containment

system must be designed and operated as follows:

1. A base must underlie the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills and accumulated precipitation until the collected material is detected and removed.
2. The base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids.
3. The containment system must have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container, whichever is greater. Containers that do not contain free liquids need not be considered in this determination.
4. Run-on into the containment system must be prevented unless the collection system has sufficient excess capacity to contain any run-on which might enter the system. Excess capacity must be in addition to the 10% of the volume of containers or the volume of the largest container, whichever is greater.
5. Spilled or leaked waste and accumulated precipitation must be removed from the sump or collection area in as timely a manner as is necessary to prevent overflow of the collection system.

Under 40 CFR 264.175(c), the EPA also addresses storage areas that store containers holding only wastes that do not contain free liquids and sets the following provisions for the storage areas:

1. The storage area must be sloped or otherwise designed and operated to drain and remove liquid resulting from precipitation, or
2. The containers must be elevated or otherwise protected from contact with accumulated liquid.

There are certain wastes for which a storage area alone will not suffice. These waste streams are listed under 40 CFR 264.175(d) and require a containment system in addition to the storage area.

EPA: Tank Systems

The EPA specifies under 40 CFR 264.193(b) that secondary containment systems are required to prevent any migration of wastes or accumulated liquid out of the system to the soil, ground water or surface water during the use of the tank system. Minimum requirements of how the system must be constructed are listed in 40 CFR 264.193(c) and include:

1. Constructed of or lined with materials that are compatible with the wastes to be placed in the tank system and must have sufficient strength and thickness to prevent failure owing to pressure gradients (including static head and external hydrological forces), physical contact with the waste to which it is exposed, climatic conditions and the stress of daily operation (including stresses from nearby vehicular traffic).
2. Placed on a foundation or base capable of providing support to the secondary containment system, resistance to pressure gradients above and below the system and capable of preventing failure due to settlement, compression or uplift.
3. Provided with a leak-detection system that is designed and operated so that it will detect the failure of either the primary or secondary containment structure or the presence of any release of hazardous waste or accumulated liquid in the secondary containment system within 24 hours, or at the earliest practicable time if the owner or operator can demonstrate that existing detection technologies or site conditions will not allow detection of a release within 24 hours.
4. Sloped or otherwise designed or operated to drain and remove liquids resulting from leaks, spills or precipitation. Spilled or leaked waste and accumulated precipitation must be removed from the secondary containment system within 24 hours, or in as timely a manner as possible to prevent harm to human health and the environment if the owner or operator can demonstrate that removal of the released waste or accumulated precipitation cannot be accomplished within 24 hours.

Along with the above requirements, a provision has been made that requires that one or more of the following devices also be implemented:

1. A liner (external to the tank)
2. A vault
3. A double-walled tank; or
4. An equivalent approved device

These four devices need to meet the stringent specifications spelled out in 40 CFR 264.193(e). For example, an external liner must be:

1. Designed or operated to contain 100% of the capacity of the largest tank within its boundary;
2. Designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the collection system has sufficient excess capacity to contain run-on or infiltration. Such additional capacity must be sufficient to contain precipitation from a 25-year, 24-hour rainfall event.
3. Free of cracks or gaps; and
4. Designed and installed to surround the tank completely and to cover all surroundings likely to come into contact with the waste if the waste is released from the tank(s) (i.e., capable of preventing lateral as well as vertical migration of the waste).

Uniform Fire Code and International Fire Code

Facilities that store hazardous materials may also be required to meet either the Uniform Fire Code (UFC) or International Fire Code (IFC). If you have questions regarding compliance with either the UFC or IFC standards, consult with your Authority Having Jurisdiction (AHJ) – normally your local fire marshal. When referring to the UFC you need to clarify with the AHJ, which fire code release needs to be applied to achieve compliance. Some states and municipalities have adopted the UFC from the National Fire Protection Association (NFPA), also known as NFPA 1. Others have adopted the UFC released by the International Conference of

Building Officials (ICBO). Since the creation of the International Code Council (ICC) in 1994, the UFC is no longer maintained (last release in 1997). It has been superseded by the subsequent releases of the IFC published by ICC. In the past several attempts to merge these two widely used model codes were unsuccessful.

Choosing a Containment System

When selecting a containment system for an application, many issues need to be considered. A list of issues and some things to contemplate are listed below.

1. Is the system chemically compatible with the products being stored?
    - . Containment system sumps are primarily constructed of one or two materials: high-density polyethylene or steel.

1. Skids usually have material choices for grids or platforms. The choice of material depends on chemical resistance as well as disposability of the product. Examples include:
    - . Wood platforms: Once contaminated, they are disposed of according to local regulations.

1. Fiberglass grids: Compatible with a wide variety of chemicals, but not suitable for corrosive materials.
2. Polyethylene grids: Compatible with a wide variety of chemicals including many corrosive materials.

2. How will the system be monitored and cleaned?
    - . Most units have drains. If they don’t, usually a spill cleanup kit will be adequate to clean up the internal sump area of the system.
3. What volume and weight of the containers will be stored?
    - . According to federal codes, a containment system must have a sufficient capacity to contain 10% of the volume of the containers or the volume of the largest container, whichever is greater. Some states may have more stringent restrictions and you should contact your AHJ for your local requirement.

1. Containment systems are commonly rated with a static weight capacity. This is a weight in a stationary mode.

4. How often will the containment system be moved? How will it be moved?
    - . Portable containment units are intended to be moved without containers on them. This is the safest mode of transport. The containers can be replaced once the containment system has reached its destination.

1. Most portable containment systems are constructed with fork pockets. These are designed to accept and be moved by forklifts or pallet jacks.

5. How will the containers be loaded onto the system?
    - . Ramps that accommodate containment systems are the easiest way to load a system. Low-profile containment systems have also been developed to address the loading issues.
6. How many containers will be loaded on the system?
    - . Portable containment systems range from accommodating four 5-gallon pails to one 55-gallon drum to whole-room containment systems for drums. Make sure when dealing with flammable products and the larger containment systems that your local fire codes are met. There are restrictions for quantities of flammable products that can be stored in one area depending on the class of the flammable product.
7. Are any of the products being stored considered flammable?
    - . Special provisions need to be taken into account, such as grounding and bonding and the amount of flammable product being stored in one area. Check your local codes for these specifications.
8. What are the state and local codes for secondary containment in your area?
    - . A listing of the regional EPA offices can be found on EPA website. Phone numbers of divisions that deal with secondary containment are listed. The regional office can refer to state EPA agencies that can explain state codes. Another source for secondary

containment requirements is your AHJ.

Frequently Asked Questions

Q: What are free liquids?

A: Free liquids are liquids that readily separate from the solid portion of a waste under ambient temperature and pressure.

Q: What does "10% of the volume of the containers, or the volume of the largest container, whichever is greater" mean?

A: As an example, consider storing four 55-gallon drums:

- Four drums x 55 gallons per drum = 220 gallons
- 10% of all = 10% of 220 gallons = 22 gallons

OR

- Volume of the largest container = 55 gallons

In this case, you would need 55 gallons of containment capacity.

Sources

Environmental Protection Agency Use and Management of Containers
Environmental Protection Agency Tank Systems
Institute of Hazardous Materials Management
Occupational Safety and Health Administration Hazard Communication Standard

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

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Trenching and Excavation Standards – Quick Tips

OSHA recognizes excavating as one of the most hazardous activities of a construction operation. OSHA revised Subpart P-Excavations, of 29 CFR 1926.650, .651, and .652 to make the standard easier to understand, permit the use of performance criteria where possible, and provide construction employers with options when classifying soil and selecting employee protection methods.

Excavating and trenching are defined as two separate items within the OSHA regulations. Excavating is any man-made cut, cavity, trench or depression in an earth surface formed by earth removal. Trenching is defined as a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less (measured at the bottom of the excavation), the excavation is also considered a trench.

Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres or other hazardous conditions. The designated competent person shall be able to demonstrate the following:

1. Training, experience and knowledge of:
    - Soil analysis

    - Use of protective systems
    - Requirements of 29 CFR Part 1926, Subpart P
2. Ability to detect:
    - Conditions that could result in cave-ins
    - Failures in protective systems
    - Hazardous atmospheres
    - Other hazards including those associated with confined spaces
3. Authority to take prompt corrective measures to eliminate existing and predictable hazards and stop work when required.

An inspection shall be conducted and documented by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated. The following list specifies the frequency and conditions requiring inspections:

- Daily and before the start of each shift
- As dictated by the work being done in the trench
- After every rainstorm
- After other events that could increase hazards, e.g. snowstorm, windstorm, thaw, earthquake, etc.
- When fissures, tension cracks, sloughing, undercutting, water seepage, bulging at the bottom or other similar conditions occur
- When there is a change in the size, location or placement of the spoil pile
- When there is any indication of change or movement in adjacent structures

Where a competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

Trenches of 4-foot or more in depth should be provided with a

fixed means of egress. Spacing between ladders or other means of egress must be such that a worker will not have to travel more than 25-feet laterally to the nearest means of egress. Ladders must be secured and extend a minimum of 36-inches above the landing. Metal ladders should be used with caution, particularly when electric utilities are present.

OSHA categorizes soil and rock deposits into four types as follows:

1. **Stable rock** is a natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed. Most of the time it is identified by a rock name such as granite or sandstone. Determining if a deposit is of this type may be difficult unless it is known whether cracks exist and whether or not the cracks run into or away from the excavation.
2. **Type A soils** are cohesive soils with an unconfined compressive strength of 1.5 tons per square foot or greater. These types of soils are often clay, silt clay, sandy clay, clay loam and in certain cases, silty clay loam and sandy clay loam.
3. **Type B soils** are cohesive soils with an unconfined compressive strength greater than 0.5, but less than 1.5 tons per square foot. Examples of types of soils within this category are angular gravel silt, silt loam and/or previously disturbed soils unless otherwise classified as type C soil.
4. **Type C soils** are cohesive soils with an unconfined compressive strength of 0.5 tons per square foot or less. Granular soils like gravel, sand and loamy sand, submerged soil, soil form which water is freely seeping and submerged rock that is not stable fall into the type C soil category.
5. **Layered geological strata** are soils that are configured in layers of several different soil types/categories. This type of soil condition must be classified on the basis of the soil type within the various layers that is the weakest of the soil type/layers. Each layer may be classified individually if a more stable layer lies below the less

stable layer, eg., where a type C soil rests on top of stable rock.

The OSHA regulation identifies the following types of test equipment and several methods to be used for evaluation of soil types:

1. Pocket Penetrometers are a direct reading, spring-operated instruments used to determine the unconfined compressive strength of saturated cohesive soils. Once pushed into the soil, an indicator sleeve displays the reading. This type of instrument reads out in either tons per square foot or kilograms per square centimeter.
2. Plasticity or wet thread test is conducted by molding a moist sample of the soil into a ball and attempting to roll it into a thin thread, approximately 1/8-inch diameter by 2 inches in length. The soil sample is held by one end. If the sample does not break or tear, the soil is considered cohesive.
3. Visual test is a qualitative evaluation of conditions around the site. In a visual test, the entire excavation site is observed, including the soil adjacent to the site and the soil being excavated. If the soil remains in clumps, it is cohesive; if it appears to be coarse-grained sand or gravel, it is considered granular. The evaluator shall also check for any signs of vibration.

During a visual test, the evaluator should check for crack-line openings along failure zones that would potentially indicate tension cracks. Evaluator should also look for existing utilities that indicate that the soil has previously been disturbed, and observe the open side of the excavation for indications of layered geologic structuring.

The evaluator should also look for signs of bulging, boiling or sluffing, as well as for signs of surface water seeping from the sides of the excavation or from the existing water table. If there is standing water in the cut, the evaluator shall check for quick conditions. In addition, the area adjacent to the excavation shall be checked for signs of foundations or other intrusions into the

failure zone and the evaluator should check for surcharging and the spoil distance from the edge of the excavation.

The specific terminology and definitions to the various terms used throughout the specific excavating and trenching regulations are detailed within the OSHA standards that pertain to this topic.

Grainger offers several soil testing devices (penetrometers) that are required by OSHA for all excavation sites where trenching takes place.

Source

OSHA

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Mold Remediation, Prevention and PPE – Quick Tips

Introduction

Mold is everywhere around us—outside in soil, wood and rotting

plants, and inside on carpet, drywall, wallpaper and insulation. Outside molds carry out nature's work by breaking down decaying organic material such as dead plants, fallen trees or dead animals. Inside, mold growth can cause an array of health concerns. However not all mold is harmful; without mold we would not have certain food and medicines like cheese or penicillin. Mold is one category of non-green, plant-like organisms (along with mildew, mushrooms, rusts, smuts and yeast) that fall within the fungus family. All fungal matter shares the common characteristic of being capable of growth without sunlight. Because of this, mold can be found almost anywhere, and can grow on almost anything as long as moisture and oxygen are present. Many types of mold exist with approximately 1,000 known species found in the United States, and over 100,000 species worldwide.

Health Effects

Currently, there are no federal standards or American Conference of Governmental Industrial Hygienists (ACGIH) established threshold limit values (TLVs) for airborne concentrations of mold or mold spores. According to the Environmental Protection Agency's (EPA's) Mold Remediation in Schools and Commercial Buildings resource, allergic reactions to mold are common. Mold can produce allergens that can trigger allergic reactions, asthma attacks or produce potent toxins and/or irritants. Hypersensitivity pneumonitis (lung inflammation) has also been linked to mold exposure. People with the greatest risk of health effects from mold exposures are the elderly, the very young and expectant mothers, as well as individuals with mold allergies, asthma and other chronic respiratory ailments.

Prevention

Mold growth frequently occurs when excessive moisture or water accumulates indoors. There is no feasible way to eliminate all molds and mold spores indoors, so the most effective way to control indoor mold growth is to control moisture. In buildings where mold is a problem, the mold must be remediated and the sources of moisture identified and eliminated.

It is important to dry water-damaged areas and items within 24 to 48 hours to prevent mold growth from starting. Water-damaged porous or absorbent materials, such as ceiling tiles, wallboard, cellulose and fiberglass insulation, should be discarded and replaced. Discard non-valuable books and papers. Be sure to photocopy important paperwork before discarding the originals. Use a water extraction vacuum to remove water from carpeting. Then use dehumidifiers and fans to accelerate the drying process. Carpet that becomes moldy usually must be replaced. Nonporous surfaces can be vacuumed or wiped with mild detergent and allowed to dry completely.

Moisture Control

Identify and repair leaky plumbing, roofs and other sources of water in a timely fashion to prevent moisture and mold growth. The EPA suggests you can minimize mold growth by reducing indoor humidity to below 60% and ideally between 30 and 50%. This can be done by venting bathrooms, kitchens, dryers and other moisture-generating sources to the outside; using air conditioners and dehumidifiers; increasing ventilation; and using exhaust fans whenever cooking, dishwashing and cleaning.

Also, reduce the potential for condensation on cold surfaces like windows, piping, exterior walls, roofing and floors by adding insulation. Do not install carpeting in areas where there is a continuous moisture problem, such as near drinking fountains, sinks or on concrete floors with leaks or frequent condensation.

Contamination Identification

A visual inspection is the most important initial step in identifying a possible contamination problem. The extent of any water damage and mold growth should be visually assessed. This assessment is important in determining mold remediation strategies.

Ventilation systems should also be visually checked, particularly for damp filters, but also for damp conditions elsewhere in the system and overall cleanliness. Ceiling tiles, gypsum wallboard,

cardboard, paper and other porous surfaces should be given careful attention during a visual inspection.

The use of special equipment to view spaces in ductwork or behind walls, and/or by using a moisture meter to detect moisture in building materials, may be helpful in identifying hidden sources of mold growth and the extent of water damage.

Remediation

The EPA's remediation guide for schools and commercial buildings offers detailed recommendations for a variety of mold removal scenarios and is a tremendous resource for anyone facing a mold problem.

Mold should be cleaned as soon as it appears. OSHA considers small remediation areas, less than 30 square feet (sq. ft.), of mold, which can be cleaned using a detergent/soapy solution or an appropriate household cleaner and allowed to dry completely. For larger areas (30-100 sq. ft.), there are commercial products that can be used for cleaning, disinfecting and sanitizing. Mold-resistant coatings are also available for use on insulation materials and inside duct work. A HEPA vacuum can be used to clean items such as furniture, concrete, carpeting or books after the material has been thoroughly dried.

According to OSHA, for small areas of mold growth, an N95 respirator, non-vented goggles and long gloves compatible with the chemicals used for surface cleaning should be worn. For larger mold remediation jobs, or in situations where high levels of airborne dust or mold spores are likely or long-term exposures are expected, the EPA suggests a full-face, powered air purifying respirator (PAPR) along with disposable coveralls, gloves and shoe covers. The cleaned area should be thoroughly dried. Dispose of any sponges or rags that were used to clean the mold, along with the used personal protective equipment (PPE).

If the mold returns quickly or spreads, it may indicate an underlying problem, such as a leak or excessive humidity. Any underlying water problems must be fixed to successfully eliminate

mold problems from reoccurring. If mold contamination is extensive, an experienced remediation professional may need to be consulted.

Sources

EPA – Mold Remediation in Schools and Commercial Buildings
EPA – Mold Resources
OSHA- A Brief Guide to Mold in the Workplace

OSHA Quick Card™ Mold
OSHA Fact Sheet Mold Hazards during Disaster Cleanup

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PPE for Spill Cleanup – Quick Tips

Employees who are engaged in emergency spill response operations no matter where they occur are covered by the Occupational Safety and Health Administration's (OSHA's) Hazardous Waste Operations and Emergency Response (HAZWOPER) standard, 29 Code of Federal Regulations (CFR) 1910.120. As first steps in limiting worker

exposure to spill hazards, engineering controls and administrative (work practice) controls must first be considered. If circumstances prohibit the use of engineering controls or work practices, or these measures do not sufficiently reduce worker exposures, OSHA mandates that personal protective equipment (PPE) be used.

Once the need for PPE is established, a careful evaluation of the hazards is necessary so selections can be made to minimize the risk to the user. For chemical situations, this includes knowing the chemical(s) involved, level of exposure (or potential exposure), physical state (liquid, solid or gas), and physiological effect(s) (toxic, carcinogen, asphyxiate, corrosive, etc.). However, when responding to a spill, much of this information is not known. In situations like this, the highest level of protection is needed.

Levels of Protection

To help users choose a total PPE package for spill cleanup, the Environmental Protection Agency (EPA) Office of Emergency and Remedial Response determined four levels of chemical risks. These levels range from unknown or highly hazardous, which requires complete protection, to non-hazardous, which requires basic work attire only. Appendix B (non-mandatory) to 29 CFR 1910.120 provides guidelines that employers can use to begin the selection of appropriate PPE. Although the Appendices to 29 CFR 1910.120 are non-mandatory, paragraph 1910.120(g)(3)(i) states “Personal protective equipment (PPE) shall be selected and used which will protect employees from the hazards and potential hazards they are likely to encounter as identified during the site characterization and analysis.”

Level A protection is required when the greatest potential for exposure exists and when the highest level of skin, respiratory and eye protection is required.

Required:

- Positive pressure, full face-piece self-contained breathing

apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA, approved by the National Institute for Occupational Safety and Health (NIOSH).
- Totally-encapsulating chemical-protective suit.
- Gloves, inner and outer, chemical-resistant.
- Boots, chemical-resistant, steel toe and shank.

Optional (as applicable):

- Long underwear.
- Hard hat (under suit).
- Disposable protective suit, gloves and boots (depending on suit construction, may be worn over totally-encapsulating suit).

Level B protection is designed to offer the highest level of respiratory protection, but a lesser level of skin protection.

Required:

- Positive pressure, full face-piece self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA, approved by NIOSH.
- Hooded chemical-resistant clothing (overalls and long-sleeved jacket; coveralls; one or two-piece chemical-splash suit; disposable chemical-resistant overalls).
- Gloves, inner and outer, chemical-resistant.
- Boots, outer, chemical-resistant, steel toe and shank.

Optional (as applicable):

- Boot-covers, outer, chemical-resistant (disposable).
- Hard hat.
- Face shield.

Level C features the same type of clothing as level B, but has a lower level of respiratory protection. An air-purifying respirator is used in place of a self-contained breathing apparatus (SCBA). This level is used when the chemical(s) and the airborne concentration(s) are known and it has been established that an air-purifying respirator is appropriate protection for the hazard.

The following constitute Level C equipment:

Required:

- Full-face or half-mask, air purifying respirators (NIOSH approved).
- Hooded chemical-resistant clothing (overalls; two-piece chemical-splash suit; disposable chemical-resistant overalls).
- Gloves, inner and outer, chemical-resistant.

Optional (as applicable):

- Boots (outer), chemical-resistant steel toe and shank.
- Boot-covers, outer, chemical-resistant (disposable).
- Hard hat.
- Escape mask.
- Face shield.

Level D offers the lowest level of protection and is used when no potential or actual hazard exists. It offers minimal protection for nuisance exposure—generally a work uniform. The following constitute Level D equipment:

Required:

- Boots/shoes, chemical-resistant steel toe and shank.

Optional:

- Boot-covers, outer, chemical-resistant (disposable).
- Safety glasses or chemical splash goggles.
- Hard hat.
- Escape mask.
- Face shield.

Suit Material Selection

After the appropriate level of PPE for spill cleanup has been determined, the choice of chemical protective clothing (CPC) material must be considered. The more important factors in selecting the appropriate CPC are chemical resistance and suit

design.

The effectiveness of the CPC to resist chemicals is generally measured by permeation testing. Permeation is the process by which a chemical moves through a sample of protective clothing material at a molecular level. Permeation testing tells us two things: breakthrough time and permeation rate. Permeation tests are conducted by following ASTM F739 Test Method for Permeation by Liquids and Gases. Breakthrough time is the time it takes the test chemical to pass from the outside surface of the sample to the inside surface of the sample. Permeation rate is the speed at which the test chemical passes through the sample once breakthrough has occurred. The ASTM F739 method only tests a swatch of the actual CPC fabric. This means that the potential for permeation through a zipper, seam, etc. is not determined. Chemical resistance data is available from many manufacturers and distributors. Unpublished data may be supplied by manufacturers upon request.

Suit design deals with how a garment is put together. Seams are an important aspect of suit design. Two pieces of material can be joined by either stitching or welding. The stitching process can create pin holes that may allow penetration of chemicals. Welded seams involve cementing or welding tape over the stitched seam. The welded seam offers a higher level of protection against exposure to contaminants.

Choosing a Glove Material

As with CPC, chemical resistance and the physical characteristic of a glove material are important. Different glove materials resist different chemicals, so no one glove is suited for all chemical exposures. A glove that is well-suited for one application may prove dangerous for another. Glove material selection must be based on the glove manufacturer’s chemical resistance guide. The actual chemical compatibility of a given glove material can vary from manufacturer to manufacturer. Another factor to consider is chemical combinations. Glove permeation guides generally list test data for pure chemicals only, not mixtures. In the non-mandatory Appendix B to the PPE standard 29

CFR 1910 subpart I, OSHA recommends the following for chemical mixtures:

“11(c) For mixtures and formulated products, (unless specific test data are available), a glove should be selected on the basis of the chemical component with the shortest breakthrough time, since it is possible for solvents to carry active ingredients through polymeric materials. For further information on chemical combinations, check the Safety Data Sheet provided by the manufacturer.”

Choosing Protective Eye and Face Protection

Eye and face protective equipment is available in several styles, sizes and materials. It is very important to match the proper protection to your work application. OSHA’s regulation 29 CFR 1910.133 requires the use of eye and face protection when workers are exposed to eye or face hazards such as flying objects, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation. OSHA’s regulation 29 CFR 1910.132(c) requires all PPE to be of safe design and construction for the work to be performed. To satisfy this requirement, the majority of eye and face protection in use today is designed, tested and manufactured in accordance with the American National Standard for Occupational and Educational Personal Eye and Face Protection Devices ANSI Z87.1-2010 or 2015 standard.

Goggles offer the most complete protection because they form a seal around the eye area preventing tiny dust particles, chemical splashes and vapors from irritating the eyes. There are two types of goggles: vented and non-vented (vented can be either indirect or direct). Non-vented goggles are just that, lenses and frames with no holes for air to seep through. They offer a higher level of protection against vapors and fumes, and can be used to keep harmful vapors out of sensitive eyes. Indirect-vented goggles are capped to allow air to move freely in and out without allowing splash or particles in. They offer the same impact protection as the direct-vented goggles. Lens fogging can be a problem. You may want to consider an anti-fog lens coating to alleviate any

potential problems. Direct-vented goggles offer protection from impact only. They fit snugly around the eye area to prevent flying objects from striking your eyes. They also offer more comfort because they allow air to flow in and out to reduce the chance of fogging.

ANSI Z87.1-2015 defines a face shield as “a protector intended to shield the wearer’s face, or portions thereof from certain hazards, as indicated by the face shield’s markings.” A protector is a complete device—a product with all of its components in their configuration of intended use. Although it would seem that face shields meeting the performance criteria of the 2015 standard can be used as standalone devices, all references in the modified Eye and Face Protection Selection Tool refer to “face shields worn over goggles or spectacles.”

Chemical resistant face shield visors are constructed from several types of materials. These materials include polycarbonate, propionate, acetate, and polyethylene terephthalate glycol (PETG). It is important to select the proper visor for the work environment.

Polycarbonate material provides the best impact and heat resistance of all visor materials. Polycarbonate also provides chemical splash protection and holds up well in extremely cold temperatures. Polycarbonate is generally more expensive than other visor materials.

Acetate provides the best clarity of all the visor materials and tends to be more scratch resistant. It also offers chemical splash protection and may be rated for impact protection.

Propionate material provides better impact protection than acetate while also offering chemical splash protection. Propionate material tends to be a lower price point than both acetate and polycarbonate.

Polyethylene terephthalate glycol (PETG) offers chemical splash protection and may provide impact protection. PETG tends to be the most economical option for face shield choices.

Sources

29 CFR 1910 Subpart I Personal Protective Equipment

29 CFR 1910.120 Hazardous Waste Operations and Emergency Response

29 CFR 1910.133 Eye and Face Protection

ANSI Z87.1-2015 American National Standard for Occupational and Educational Personal Eye and Face Protection Devices

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Construction Sites and Water Runoff – Quick Tips

It might surprise you to hear that sediment runoff rates from construction sites are typically 10 to 20 times greater than those from agricultural lands, and 1000 to 2000 times greater than those from forested lands. To address this issue, the Environmental Protection Agency (EPA) has regulations that focus specifically on construction sites and water runoff. The Federal Water Pollution Control Act prohibits the discharge of any pollutant to a

navigable water from a point source unless that discharge is authorized by a National Pollution Discharge Elimination System (NPDES) permit. Construction sites for which a NPDES permit is sought will fall into one of two categories, or phases.

Phase I

This phase addresses discharges from large construction activities disturbing five or more acres.

Phase II

Phase II affects many more entities than Phase I, because it pertains to smaller construction sites between one and five acres. Phase II can also cover construction sites under one acre if they are part of a larger common plan of development or sale with a planned disturbance of between one and five acres. To get a good sense of the requirements, a few definitions are in order.

Point source: A point source is any discernable, confined and discrete conveyance, such as a pipe, ditch, channel, tunnel, conduit, discrete fissure or container. It also includes vessels or other floating craft from which pollutants are or may be discharged. By law, the term "point source" also includes concentrated animal feeding operations, which are places where animals are confined and fed. By law, agricultural stormwater discharges and return flows from irrigated agriculture are not "point sources."

Navigable water or water of the United States: The term "water of the United States" means navigable waters, tributaries to navigable waters, interstate waters, the oceans out to 200 miles and intrastate waters which are used: by interstate travelers for recreation or other purposes, as a source of fish or shellfish sold in interstate commerce, or for industrial purposes by industries engaged in interstate commerce.

Operator: An Operator in this instance is a party or parties that have:

- Control of construction project plans and specifications

- Day-to-day operational control of those activities that are necessary to ensure compliance with a storm water pollution prevention place (SWPPP) for the site or other permit conditions

NPDES permit: This is a permit that translates general requirements of the Clean Water Act into specific provisions tailored to the operations of each person discharging pollutants.

Requirements

Phase II construction programs require operators of Phase II small construction sites to obtain an NPDES permit if the operators are discharging pollutants from a point source to waters of the United States. The NPDES permit contains limits on what can be discharged, monitoring and reporting requirements and other provisions to ensure that the discharge does not hurt water quality or people's health. These regulated entities must implement stormwater pollution protection programs or stormwater management programs using best management practices to effectively reduce the discharge of pollutants into receiving waters. There may also be additional state, tribal or local construction site water runoff programs required in certain areas.

The EPA has recommended that the NPDES permitting authorities use their existing Phase I large construction permits as a guide in developing the Phase II permits. Although the specific NPDES permitting authority may have different requirements, the Phase II permits will typically consist of three main components:

1. Submission of notice of intent: This notice of intent will include general information on the site and what is going to be done at the site.
2. Stormwater pollution prevention plan(SWPPP): Almost all NPDES permitting authorities are going to require a type of SWPPP that will detail how you are going to control the runoff.
3. Notice of termination: Once the project is completed or is taken over by another operator a notice of termination would be submitted.

Frequently Asked Questions

Q: Do I need an NPDES permit for construction site water runoff?

A: It depends on where you discharge pollutants. If you discharge from a point source into waters of the United States, you need an NPDES permit. If you discharge pollutants into a municipal sanitary sewer system, you do not need an NPDES permit, but you should ask the municipality about their permit requirements. If you discharge pollutants into a municipal storm sewer system, you may need a permit depending on what you discharge. You should ask the NPDES permitting authority.

Q: Where do I apply for a NPDES permit?

A: NPDES permits are issued by states that have obtained EPA approval to issue permits or by EPA Regions in states without such approval.

Source

Stormwater Phase II Small Construction Program Overview

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