Cleanroom Safety Meeting Kit – Spanish

QUÉ ESTÁ EN RIESGO

En el caso de los productos sensibles y valiosos, la sala blanca es el centro de la producción. Cualquier contaminación por sustancias como el polvo, los microorganismos o el humo puede perturbar los delicados procesos de producción y afectar negativamente a la calidad del producto.

CUÁL ES EL PELIGRO

PELIGROS EN LOS ENTORNOS DE LAS SALAS BLANCAS

- Esclusas de aire
- Puertas de paso
- Salas con batas
- Control de la estática
- Entornos sellados
- Controles de humedad y temperatura
- Almohadillas adhesivas en el suelo
- Sistemas de supresión de incendios
- Trabajadores que utilizan respiradores personales motorizados o ERAs

LA IDENTIFICACIÓN DE PELIGROS COMIENZA EN LA FASE DE DISEÑO

El trabajo de identificación de riesgos debe ser exhaustivo. **Debe tener en cuenta la construcción de la propia sala, el equipo utilizado y las materias primas que se introducen en ella.**

De hecho, el proceso debe comenzar en la fase de diseño de la propia sala. Y esto requerirá la ayuda de un experto, porque establecer una separación tan estricta entre la sala blanca y la zona exterior crea peligros para ambos espacios.

Pensemos, por ejemplo, en el sistema de filtración. Se necesitarán

filtros HEPA, lo que implica un mantenimiento regular, pruebas, cambios de filtro programados, supervisión y mantenimiento de registros. También hay que tener en cuenta de dónde procede el aire de reposición (el aire que sustituye al que se expulsa de las instalaciones de la sala blanca) y los posibles riesgos respiratorios que se pueden introducir con él.

Los resbalones, los tropezones y las caídas son una de las causas habituales de lesiones de los trabajadores. Las alfombras adhesivas son un gran mecanismo para controlar las partículas, pero si se deja una sin anclar puede convertirse en un peligro de tropiezo.

El acceso y la salida limitados también son un factor, especialmente en un escenario de rescate. Las barras antipánico en las puertas pueden facilitar la salida de la sala blanca en caso de emergencia. Lo mismo ocurre con las salidas de emergencia. Y las alarmas de incendio y de atmósfera contaminada pueden salvar vidas.

La sala blanca puede contaminarse si un trabajador lleva una mascarilla al revés. Por ello, es importante que los trabajadores estén debidamente capacitados para distinguir la diferencia y estar atentos. Lo mismo ocurre con los monos: una capacitación adecuada puede ayudar a los trabajadores a evitar la contaminación. Los brazos y las piernas de los monos nunca deben tocar el suelo de la sala blanca.

COMO PROTEGERSE

GESTIÓN DE LA SEGURIDAD EN UNA SALA BLANCA

Una vez completado el inventario de peligros de la sala y del trabajo que se realiza en ella, es el momento de asegurarse de que los procesos de gestión de la seguridad los abordan de forma exhaustiva. Esto incluye:

- Una política de seguridad de la sala blanca
- Procedimientos identificados de trabajo, entrada y salida de la sala blanca

- Mapas de flujo de trabajo o de procesos para todos los aspectos de la sala y del trabajo
- Descripciones claras de los puestos de trabajo y documentos de trabajo para el trabajo que se realiza en la sala
- Educación y capacitación, incluidas las sesiones informativas diarias sobre la seguridad, específicas para las cuestiones relacionadas con la sala blanca.
- Una lista de tareas, revisada al menos una vez al mes y siempre que se produzca un cambio
- Un sistema de notificación de fallos e incidentes
- Un calendario de inspecciones
- Una cadena de mando clara y un proceso de notificación de errores, omisiones e incumplimientos
- La compra, el uso y la eliminación de los EPP (incluidos los elementos periféricos, como las alfombras adhesivas).
- Un sistema que garantice la existencia de un sistema de filtración de aire adecuado y su mantenimiento periódico
- Pruebas de detección de partículas en el aire
- Un sistema de gestión de la tasa de cambios de aire por hora
- Sistemas para gestionar un espacio confinado o una situación de trabajador solitario (para las jurisdicciones en las que la sala blanca entra en estas categorías)

CONSEJOS PARA LA SEGURIDAD EN LA SALA BLANCA

El personal debe llevar protecciones completas, como capuchas, monos especialmente diseñados, cubiertas para los zapatos o botas especiales, y cualquier otra cosa que sea necesaria para realizar tareas delicadas. Deben utilizarse gafas de seguridad cuando se trabaje con productos químicos. Deben utilizarse mascarillas y protectores faciales para los procesos delicados que puedan provocar la rotura de cristales o explosiones. Utilice siempre guantes para manipular productos químicos peligrosos y para evitar la contaminación de la piel. Algunos procesos requieren un respirador, así que asegúrese de tener la capacitación y la cualificación necesarias para utilizarlos si es necesario.

Los procesos en las salas blancas pueden implicar a menudo la

manipulación de productos químicos como ácidos, bases, disolventes, agentes cancerígenos y criogénicos posiblemente peligrosos. Comprenda los materiales presentes y su uso y conozca los procedimientos adecuados de manipulación y eliminación de residuos. Si entra en contacto con un producto químico de este tipo, aclare la zona con agua durante 15 minutos y quítese la ropa afectada. El ácido fluorhídrico puede ser especialmente peligroso si entra en contacto con los ojos o la piel. Esta sustancia puede quemar los tejidos e incluso los huesos, lo que puede ser muy destructivo. Como ya se ha dicho, aclare cualquier zona afectada con agua y busque ayuda médica.

Los procesos químicos deben realizarse bajo campanas de humos o en bancos húmedos si suponen un riesgo de derrame. Los productos químicos deben estar cuidadosamente etiquetados y almacenados. Todos los productos químicos y las mezclas deben limpiarse adecuadamente, y los residuos peligrosos deben eliminarse.

Es útil conocer la disposición de la sala blanca y saber dónde se encuentra el equipo de seguridad necesario, como duchas de seguridad, extintores, estaciones de lavado de ojos e interruptores de cierre de emergencia. Es bueno saber qué indican las señales y alarmas de emergencia, y dónde evacuar en caso necesario. Familiarícese con el equipo de control de gases peligrosos y con las alarmas que puedan indicar condiciones de aire peligroso.

CONCLUSIÓN

El mantenimiento de la seguridad y el cumplimiento de las estrictas normas de un entorno controlado de sala blanca requieren una capacitación exhaustiva e inspecciones rutinarias. Lo que hace que el mantenimiento de las normas de seguridad sea un reto es la imprevisibilidad de las cosas que pueden salir mal y, en última instancia, contaminar una sala limpia.

Cleanroom Safety Stats and Facts – Spanish

HECHOS

A continuación, se enumeran cuatro factores básicos que contribuyen a la contaminación a través de los técnicos y/u operadores de las salas blancas:

1. **Higiene:** Las pequeñas variaciones en la higiene personal pueden suponer una gran diferencia en lo que respecta a la contaminación potencial dentro de un entorno altamente controlado. Si las manos y/o la cara de una persona no están completamente limpias, hay un número mucho mayor de partículas potencialmente dañinas que se filtran por debajo de la ropa de protección, incluyendo caspa, pelo y piel suelta.
2. **La ropa interior:** Aunque las prendas de protección especiales contribuyen en gran medida a reducir la contaminación, la posibilidad puede reducirse aún más si los operarios prestan atención al tipo de ropa de calle que eligen para trabajar. Los tejidos como la franela, el ante, el terciopelo y otros que se desprenden o forman "píldoras" introducen riesgos adicionales en el ambiente. Si no están presentes en primer lugar, no hay posibilidad de que estos materiales se escapen de las prendas de la sala blanca y provoquen contaminación.
3. **Humo residual:** No es lo mismo que el humo de segunda mano, el humo residual consiste en partículas que quedan en los pulmones y que se emiten lentamente al aire después de que alguien fume un cigarrillo o un puro. Si los empleados fuman durante los descansos o el tiempo libre, el humo residual puede convertirse en un posible contaminante incluso en las salas blancas más estériles. Pedir a los fumadores que hagan gárgaras o se enjuaguen la boca ayudará a disminuir este riesgo potencial. Sin embargo, la mejor solución es utilizar

mascarillas que impidan que el humo residual, así como otras partículas del aliento exhalado, entren en el entorno controlado.

4. **Actitud del operador:** No es un factor físico, pero es igual de importante, la actitud que tienen los técnicos y operarios en relación con la probabilidad de causar contaminación en algún momento. Los empleados que no entienden por qué tienen que seguir ciertos procedimientos, o simplemente no les importa, son más propensos a pasar por alto los protocolos necesarios y, eventualmente, causar que algo vaya mal.

ESTADÍSTICAS

- Según la Oficina Nacional de Equilibrio Medioambiental (NEBB), la principal causa de contaminación en las salas blancas es el personal. De hecho, los operarios y técnicos de las salas blancas son responsables de entre el 70% y el 80% de los problemas de contaminación de las salas blancas.

- 6.000 lesiones mortales en el lugar de trabajo al año
- 50.000 muertes por exposición a sustancias químicas
- 6 millones de lesiones no mortales

- Por término medio, los fabricantes de productos farmacéuticos gastan aproximadamente 3,1 millones de dólares al año para remediar los sucesos de contaminación. El coste de una alerta, o interrupción, puede oscilar entre 1.000 y 10.000 dólares y el coste de una sola acción, o investigación, puede oscilar entre 10.000 y 60.000 dólares.
- Las retiradas de productos dañados y contaminados pueden costar millones a las empresas, con más de 1.734 retiradas de medicamentos comunicadas por la Administración de Alimentos y Medicamentos de EE.UU. (FDA).

Cleanroom Safety Fatality File

The Clean Room’s Dirty Secret

By all measures, Armida Mesa was an unlikely candidate for breast cancer. She is Latina (Hispanic women have a lower rate of the disease than most ethnic groups); she has given birth to two sons (childbearing also lowers susceptibility); she doesn’t smoke or drink; and neither her mother nor any of her seven sisters has any history of the disease. Why Mesa beat the odds and was diagnosed with cancer in 1984 at age 40 will never be known for certain.

Mesa, now 57, believes she knows why she got sick-and why her co-worker Suzanne Rubio died of breast cancer at age 36, and why several more of her acquaintances also developed cancer. They all worked at an IBM semiconductor plant in San Jose, California, making the silicon chips that run computers, cell phones, and other high-tech products. Now, along with 250 other semiconductor workers and their families, Mesa is trying to prove that the toxic mixture of chemicals used in high-tech factories has caused cancer in workers and birth defects in their children-and that their employers knew of the hazards but did not act to protect them.

Cleanroom Safety Infographic

ANATOMY OF A CLEANROOM SUIT

Hood

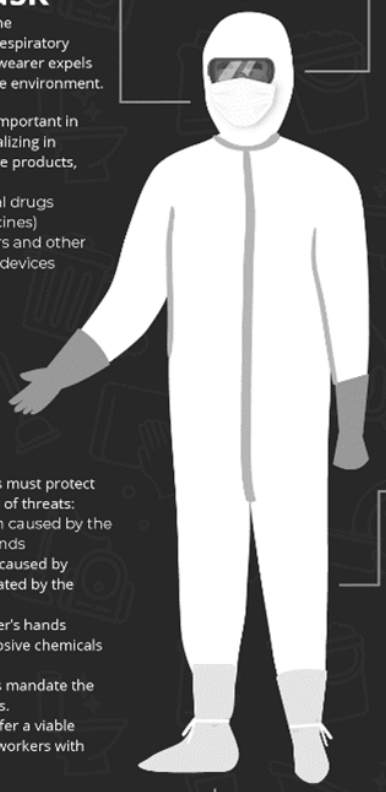
- Hoods are required for cleanrooms where full-body apparel is needed.
  - A well-designed and properly secured hood prevents particles generated by bodily movement from entering the cleanroom.
- Hoods are often mandated in ISO Class 3, 4, 5, 6 and 7 cleanrooms.

Face Mask

- Masks minimize the concentration of respiratory particles that the wearer expels into the immediate environment.
- This is especially important in cleanrooms specializing in extremely sensitive products, such as:
  - Pharmaceutical drugs (including vaccines)
  - Microprocessors and other tiny electronic devices

Goggles

- They primarily serve to prevent eyebrow hairs, skin cells and other contaminants from falling into product or onto sensitive surfaces.
- These are also intended to protect the wearer's eyes from chemicals and other hazards.
- Goggles specially made for cleanroom use typically come with a number of features to accommodate these environments:
  - Anti-fog lenses
  - Anti-linting straps
- Reusable goggles are designed to withstand repeated sterilization cycles without degradation of functionality.
- Goggles are often required in ISO Class 3, 4, 5 and 6 cleanrooms.



Gloves

- Cleanroom gloves must protect against a number of threats:
  - Contamination caused by the use of bare hands
  - Contamination caused by particles generated by the glove itself
  - Injury to the user's hands caused by corrosive chemicals
- Many cleanrooms mandate the use of latex gloves.
  - Nitrile gloves offer a viable alternative for workers with latex allergies.

Frock or Coverall

- Forming the largest component of the standard cleanroom uniform, frocks and coveralls cover the torso and lower body.
  - Frocks are generally used in less restrictive cleanrooms.
  - Coveralls, which have less air permeability, are generally for more restrictive cleanrooms.
- These are also intended to protect the wearer's eyes from chemicals and other hazards.
- This apparel should include cleanroom-friendly features such as:
  - Electrostatic discharge (ESD) protection
  - Anti-linting fabric
  - Flame and arc flash resistance
  - Comfort—to reduce perspiration that can enter the atmosphere

Boots

- In addition to providing comfort, cleanroom boots provide several important benefits.
  - Properly fitted boots prevent particulate matter from escaping into the immediate environment.
  - Ankle straps ensure a tight fit.
- Several sole options are available, including:
  - Molded soles - These are flat and comfortable to wear.
  - Hypalon soles - These are made from chemical-resistant non-skid material with a polyester substrate and anti-static coating.
- Alternatively, some cleanrooms use shoe covers that can be worn over normal footwear.
  - Shoe covers can sharply reduce the risk of cross-contamination.

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

Cleanroom Safety Infographic – Spanish



Fuente: *https://papelmatic.com/*

Cleaning Products Can Lead to Asthma Meeting Kit – Spanish

QUÉ ESTÁ EN RIESGO

Los adultos tienen asma causada o agravada por las sustancias que utilizan o a las que están expuestos en el trabajo. Se trata de una afección denominada “asma relacionada con el trabajo” (ART).

El ART puede desencadenar una respuesta asmática en trabajadores que ya tienen asma o incluso ser la causa de un asma de nueva aparición.

CUÁL ES EL PELIGRO

El asma está causada o desencadenada por sustancias denominadas asmágenos o sensibilizadores. Cuanto más se expone el cuerpo a un asmágeno/sensibilizador, más sensible se vuelve a él y, con el tiempo, se desarrollan síntomas de asma cada vez que se produce la exposición.

COMO PROTEGERSE

EL DESARROLLO DEL ASMA

En la actualidad existen hasta 300 asmágenos documentados, muchos de los cuales se encuentran en productos de limpieza tanto industriales como domésticos. **La única forma de tratar el ART es retirar la sustancia, o al trabajador, del lugar de trabajo.**

Algunas alergias respiratorias pueden ser provocadas por las fragancias, que son mezclas químicas complejas utilizadas habitualmente para perfumar ambientadores, limpiadores, productos de cuidado personal y otros bienes de consumo. El ART es una de las principales preocupaciones en los trabajos de limpieza. Según un estudio realizado en 2010 por el Departamento de Salud del Estado de Nueva York, los niños nacidos de mujeres que realizaron trabajos de limpieza durante el embarazo tienen un riesgo elevado de sufrir defectos de nacimiento.

CALIDAD DEL AIRE INTERIOR Y LIMPIEZA

La limpieza puede propagar los desencadenantes del asma o empeorar

la calidad del aire interior. Algunos utensilios, como los plumeros, sólo mueven el polvo, lo que puede propagar ácaros y pequeñas partículas por el aire. Algunas aspiradoras pueden tener fugas de aire, escupiendo las partículas de su alfombra de nuevo al aire.

Muchos productos de limpieza contienen aromas fuertes, sustancias químicas y compuestos orgánicos volátiles (COV) que pueden desencadenar el asma. Un estudio reveló que el uso regular de productos de limpieza era tan perjudicial como fumar varios cigarrillos al día. Algunos productos pueden eliminar algunos alérgenos y desencadenantes del asma, pero aun así pueden irritar los pulmones.

Los productos de limpieza que contienen COV y otras sustancias tóxicas pueden ser, entre otros, los siguientes

- Ambientadores;
- Blanqueador de cloro;
- Detergente y líquido lavavajillas;
- Productos químicos de limpieza en seco;
- Limpiadores de alfombras y tapicerías;
- Abrillantadores de muebles y suelos; y
- Limpiadores para hornos.

OTROS PELIGROS PARA LA SALUD QUE DESENCADENAN EL ASMA

Las fragancias naturales de los productos de limpieza, sobre todo en los ambientadores, pueden reaccionar con altos niveles de ozono procedentes de fuentes interiores (por ejemplo, de algunos aparatos de limpieza del aire) o del aire exterior para formar formaldehído, un conocido carcinógeno humano, y partículas finas peligrosas en el interior. El ozono es un gas nocivo, pero invisible, que empeora el asma y otras enfermedades pulmonares. Las partículas también son contaminantes atmosféricos comunes que pueden agravar el asma y otras enfermedades pulmonares y suponer un riesgo de infarto e ictus. Tanto el ozono como las partículas pueden poner en peligro la vida.

- Las chucherías y otros objetos pequeños en estanterías y

librerías pueden acumular polvo y desencadenar el asma. Para evitar un aumento de las partículas de polvo en el aire, retire estos objetos y guárdelos en un lugar seguro que no se convierta en una amenaza potencial para su salud pulmonar. Si tiene estos artículos a la vista, límpielos regularmente para evitar que se acumulen.

- Además de provocar dolores de cabeza, los productos de limpieza perfumados pueden exacerbar algunos síntomas de la EPOC o el asma. Estas fragancias pueden provocar dificultad para respirar, mareos y un empeoramiento del asma. Para evitar estos efectos secundarios, evite los productos de limpieza comprados en tiendas. Pero si va a comprar, busque algo sin fragancia.

MEJORES PRÁCTICAS DE LIMPIEZA

Si encuentra un producto que le provoca una reacción, deséchelo inmediatamente. Muchos de los limpiadores que usamos hoy en día y que matan el moho y las bacterias contienen pesticidas, así que lea las etiquetas. Sepa qué contienen los productos que utiliza y siga las instrucciones de seguridad. Todas las empresas deben tener y leer las hojas de datos de seguridad (SDS) de todos los productos comerciales que se utilicen, y utilizar el equipo de protección personal (EPP) adecuado.

- Utilice guantes y gafas para proteger su piel y sus ojos.
- No mezcle nunca productos de limpieza.
- Nunca utilice un limpiador a plena potencia cuando las instrucciones indiquen que debe diluirlo.
- Tenga cuidado en habitaciones pequeñas o con poca ventilación. Deje las ventanas abiertas y ponga ventiladores para que el aire circule.
- Utilice limpiadores menos tóxicos siempre que sea posible.
- El uso de mascarillas no evitará que respire los vapores de los limpiadores.
- Nunca mezcle lejía o cualquier producto que contenga lejía con cualquier limpiador que contenga amoníaco.

CONCLUSIÓN

Es mejor evitar por completo los productos de limpieza comprados en las tiendas. Incluso los etiquetados o certificados como “verdes” pueden contener ingredientes que empeoran los síntomas de la enfermedad pulmonar. Aunque estos productos reducen la exposición a las sustancias químicas, no las eliminan.

Cleaning Products Can Lead to Asthma Fatality File

Workplace exposures and the cost of occupational asthma

A 39-year-old man hired by an auto parts manufacturer had been diagnosed with asthma six years earlier but never experienced any symptoms. Although he was a smoker and obese, his health check-up revealed nothing else of concern. His work involved die design, machining, grinding, injection process simulation, and inspection. Six years after hire, a cough and difficulty breathing became a nuisance. A year later, breathing difficulties sent him to the emergency department. A year later, he died at age 47. The cause of death was work-exacerbated asthma due to exposure to styrene, a chemical which was used in the injection process.

In another case, this one reported by the National Institute for Occupational Safety and Health (NIOSH), a man in his 20s went to work for a resin manufacturer. One of his job functions was to insert fuel into a reaction vessel. The fuel contained pulverized phthalic anhydride and anhydrous maleic anhydride; two substances that have been documented as linked to asthma. This young man, in

good health at the start, developed asthma two years into his job. It was occupational asthma directly associated with the work environment.

The chemicals mentioned in these two cases are among more than 300 substances used in the workplace that are known or suspected to cause asthma in healthy employees or exacerbate asthma in employees who have received an asthma diagnosis.

Other occupational exposures that potentially cause or worsen asthma include:

- Animals and animal by-products
- Diacetyl
- Formaldehyde
- Isocyanates
- Plant-based fibers
- Latex
- Nuts
- A range of other chemicals

In addition to the ones listed, other work aspects cited in reports of occupational asthma include smoke and fumes, physical conditions such as poor ventilation, vapors and gases, and other unidentified substances.

Cleaning Products Can Lead to Asthma Infography – Spanish

¿Pueden causar asma los productos de limpieza?



Claro que sí.

Aunque usted no lo crea, los productos de limpieza utilizados en el trabajo pueden agravar el asma ya existente o causar nuevos casos de asma en trabajadores que los utilizan con frecuencia.

Cualquier empleado, sea de limpieza, oficina u hospital, puede utilizarlos ya que permiten limpiar, desinfectar y controlar el polvo o el moho en las superficies. Algunas personas pueden padecer problemas respiratorios al trabajar con estos productos o en áreas cuya limpieza requiere su utilización.

Fuente: *https://www.nj.gov/*

Cleaning Products Can Lead to Asthma Meeting Kit

Adults have asthma caused or aggravated by substances they use or are exposed to at work. This is a condition referred to as “Work Related Asthma” (WRA).

WRA can trigger an asthmatic response in workers who already have asthma or even be the cause of new-onset asthma. The asthma is

caused or triggered by substances called asthmagens or sensitizers. The more the body is exposed to an asthmagen/sensitizer it becomes more sensitive to it and over time asthma symptoms develop whenever exposure occurs.

THE DEVELOPMENT OF WRA

There are currently as many as 300 documented asthmagens, with many found in both industrial and household cleaning products. **The only way to treat WRA is to remove the substance, or the worker from the workplace.**

Some respiratory allergies may be set off by fragrances, which are complex chemical mixtures commonly used to scent air fresheners, cleaners, personal care products and other consumer goods. WRA is a major concern in janitorial work. According to a 2010 study by the New York State Department of Health, children born to women who held cleaning jobs while pregnant have an elevated risk of birth defects.

INDOOR AIR QUALITY AND CLEANING

Cleaning may actually spread asthma triggers or worsen your indoor air quality. Some tools like feather dusters only move dust around, which can spread dust mites and small particles through the air. Some vacuum cleaners can leak air, spitting the particles from your carpet right back into the air.

Many cleaning products contain strong scents, chemicals, and volatile organic compounds (VOCs) that can trigger asthma. One study found that regular use of cleaning products was as harmful as smoking several cigarettes a day. Some products may remove some allergens and asthma triggers but can still irritate your lungs.

Cleaning supplies and products containing VOCs and other toxic substances can include, but are not limited to:

- Air fresheners;
- Chlorine bleach;

- Detergent and dishwashing liquid;
- Dry cleaning chemicals;
- Rug and upholstery cleaners;
- Furniture and floor polish; and
- Oven cleaners.

OTHER HEALTH DANGERS TRIGGERING ASTHMA

Natural fragrances in cleaning products, particularly in air fresheners, may react with high levels of ozone from indoor sources (for example, from some air cleaning devices) or from outdoor air to form formaldehyde, a known human carcinogen, and dangerous fine particles indoors. Ozone is a harmful, but invisible, gas that worsens asthma and other lung diseases. Particles are also common air pollutants that can worsen asthma and other lung diseases and risk heart attacks and stroke. Both ozone and particles can be life-threatening.

- Knick-knacks and other small items on shelves and bookcases can collect dust and trigger asthma. To prevent an increase in dust particles in the air, remove these items and store them somewhere they’re safe and won’t become a potential threat to your lung health. If you do keep these items on display, dust them regularly to prevent build-up.
- In addition to causing headaches, scented cleaning products can exacerbate some symptoms of COPD or asthma. These scents can cause shortness of breath, dizziness and worsened asthma. To avoid these side effects, steer clear of store-bought cleaners. But if you do go to buy, look for something without any fragrance.

BEST CLEANING PRACTICES

If you find a product that is causing a reaction, dispose of it immediately. Many of the cleaners we use today that kill molds and bacteria contain pesticides, so read the labels. Know what is in the products you are using and follow the safety instructions. All

businesses should have and read the Safety Data Sheets (SDS) on every commercial product that is in use, and use the proper Personal Protective Equipment (PPE).

- Wear gloves and goggles to protect your skin and eyes.
- Never mix cleaning products.
- Never use a cleaner at full strength when the instructions say to dilute it.
- Be careful in small rooms or rooms with poor ventilation. Leave windows open and bring in fans to keep the air circulating.
- Use less toxic cleaners whenever possible.
- Using dust masks will not prevent you from breathing fumes from cleaners.
- Never mix bleach or any bleach-containing product with any cleaner containing ammonia.

FINAL WORD

It’s best to avoid store-bought cleaners altogether. Even those labeled or certified “green” can still contain ingredients that make lung disease symptoms worse. Though these products do reduce exposure to chemicals, they don’t completely eliminate them.

Cleaning Products Can Lead to Asthma Stats and Facts

FACTS

1. Cleaning products can be toxic for people with asthma as they often contain chemical compounds that can inflame the airways, leaving people prone to an asthma attack.

2. Cleaning products can cause long-term lung damage for people with asthma.
3. Fumes from cleaning products used at work can make existing asthma worse.
4. Products such as bleach, glass cleaner, detergents and air fresheners exacerbated asthma-related symptoms for the women, and their reduced lung function lasted until the morning after exposure, in some cases getting worse with time.
5. Many common household cleaners contain chemicals that provoke or worsen asthma or COPD symptoms, making cleaning uncomfortable and potentially dangerous.

STATS

- Many of the children with asthma had significant asthma risk factors besides VOCs: 77% had at least one parent with an allergy problem and 57% had at least one parent with asthma.
- Seventy-seven percent of the asthmatic children had a genetic tendency to have allergic reactions such as asthma or allergies; 51% of the children without asthma had this tendency.
- Children who had lived in a home with a fume-emitting heater during the first year of their life were 47% more likely to have hyperresponsive airways, wheezing, and had twice the risk of developing asthma compared with children not exposed to fume-emitting heaters early in life.
- Exposure to cleaning products caused children to be 35 percent more likely to have chronic difficulty breathing. In addition, they were 49 percent more likely to have chronic allergies.

Cleaning Products Can Lead to Asthma Stats and Facts – Spanish

HECHOS

1. Los productos de limpieza pueden ser tóxicos para las personas con asma, ya que suelen contener compuestos químicos que pueden inflamar las vías respiratorias, dejando a las personas propensas a un ataque de asma.
2. Los productos de limpieza pueden causar daños pulmonares a largo plazo a las personas con asma.
3. Los humos de los productos de limpieza utilizados en el trabajo pueden empeorar el asma existente.
4. Productos como la lejía, el limpiacristales, los detergentes y los ambientadores exacerbaron los síntomas relacionados con el asma de las mujeres, y su reducción de la función pulmonar duró hasta la mañana siguiente a la exposición, empeorando en algunos casos con el tiempo.
5. Muchos limpiadores domésticos comunes contienen sustancias químicas que provocan o empeoran los síntomas del asma o la EPOC, lo que hace que la limpieza sea incómoda y potencialmente peligrosa.

ESTADÍSTICAS

- Muchos de los niños con asma tenían importantes factores de riesgo de asma además de los COV: El 77% tenía al menos un padre con problemas de alergia y el 57% tenía al menos un padre con asma.
- El 77% de los niños asmáticos tenía una tendencia genética a tener reacciones alérgicas como el asma o las alergias; el 51% de los niños sin asma tenía esta tendencia.
- Los niños que habían vivido en un hogar con un calefactor que emitía humos durante el primer año de su vida tenían un

47% más de probabilidades de tener vías respiratorias hiperreactivas, sibilancias y tenían el doble de riesgo de desarrollar asma en comparación con los niños que no estaban expuestos a calefactores que emitían humos al principio de su vida.
- La exposición a los productos de limpieza hizo que los niños tuvieran un 35 por ciento más de probabilidades de tener dificultades respiratorias crónicas. Además, tenían un 49 por ciento más de probabilidades de padecer alergias crónicas.

Cleaning Products Can Lead to Asthma Fatality File – Spanish

La exposición en el lugar de trabajo y el coste del asma ocupacional

A un hombre de 39 años contratado por un fabricante de piezas de automóviles se le había diagnosticado asma seis años antes, pero nunca había experimentado ningún síntoma. Aunque era fumador y obeso, su examen médico no reveló nada más preocupante. Su trabajo consistía en el diseño de matrices, el mecanizado, el rectificado, la simulación del proceso de inyección y la inspección. Seis años después de ser contratado, la tos y la dificultad para respirar se convirtieron en una molestia. Un año más tarde, las dificultades respiratorias le enviaron al servicio de urgencias. Un año después, falleció a la edad de 47 años. La causa de la muerte fue un asma exacerbada por el trabajo debido a la exposición al estireno, una sustancia química que se utilizaba en el proceso de inyección.

En otro caso, éste comunicado por el Instituto Nacional de

Seguridad y Salud en el Trabajo (NIOSH), un hombre de 20 años fue a trabajar a un fabricante de resina. Una de sus funciones era introducir combustible en un recipiente de reacción. El combustible contenía anhídrido ftálico pulverizado y anhídrido maleico anhídrido; dos sustancias que se ha documentado que están relacionadas con el asma. Este joven, que gozaba de buena salud al principio, desarrolló asma a los dos años de estar trabajando. Se trataba de un asma ocupacional directamente asociada al entorno laboral.

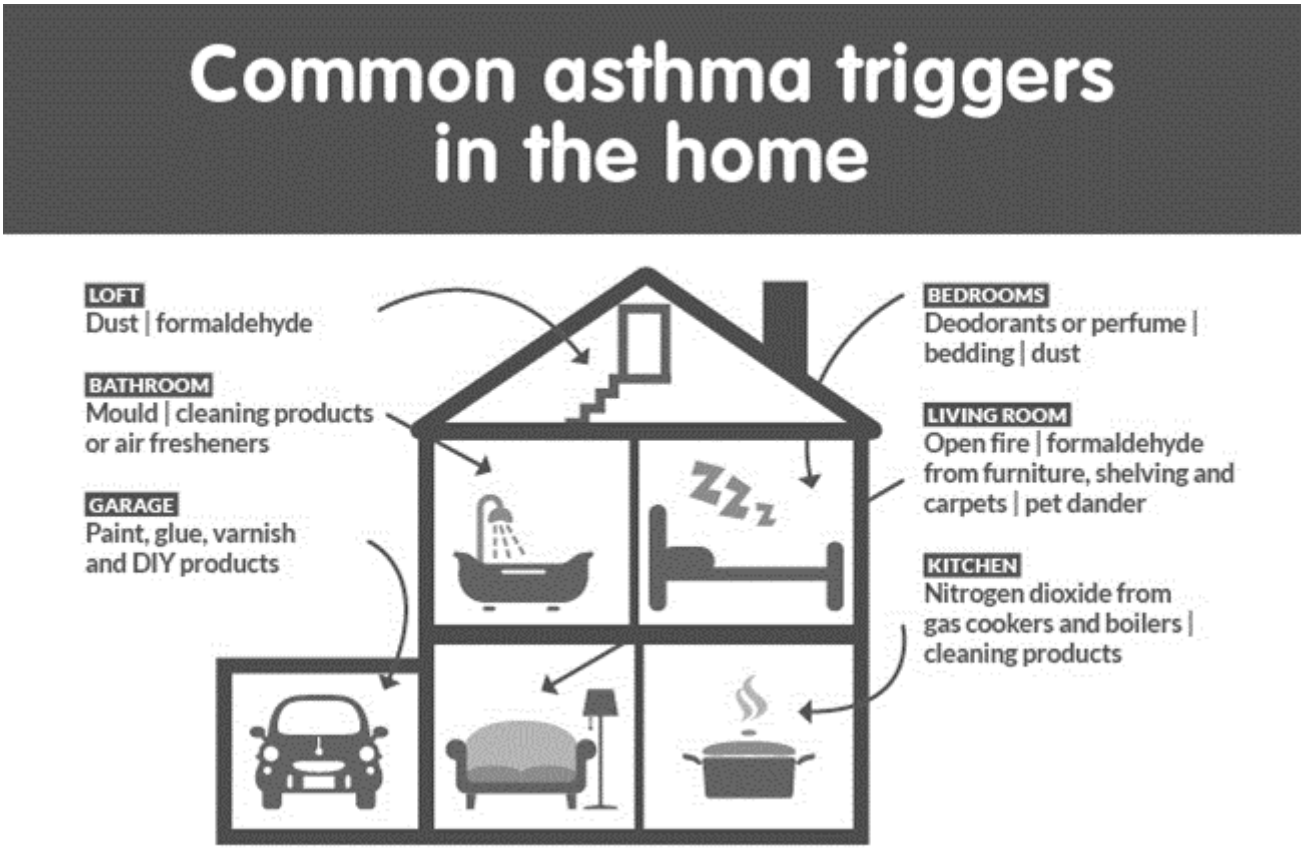
Los productos químicos mencionados en estos dos casos se encuentran entre las más de 300 sustancias utilizadas en el lugar de trabajo de las que se sabe o se sospecha que causan asma en los empleados sanos o que agravan el asma en los empleados que han recibido un diagnóstico de asma.

Otras exposiciones laborales que pueden causar o empeorar el asma son

- Animales y subproductos animales
- Diacetilo
- Formaldehído
- Isocianatos
- Fibras vegetales
- Látex
- Nueces
- Una serie de otras sustancias químicas

Además de los enumerados, otros aspectos del trabajo citados en los informes sobre asma ocupacional son el humo y los vapores, las condiciones físicas como la mala ventilación, los vapores y los gases, y otras sustancias no identificadas.

Cleaning Products Can Lead to Asthma Infography



Source: *https://www.eco3premierclub.com*

SPANISH: BBP – Bloodborne Pathogens

Course Description

This course teaches employees how to identify common bloodborne pathogens in the workplace, how they are transmitted, engineering and work practice controls used to prevent contact with, and infection from, body fluids, and what to do if exposure occurs.

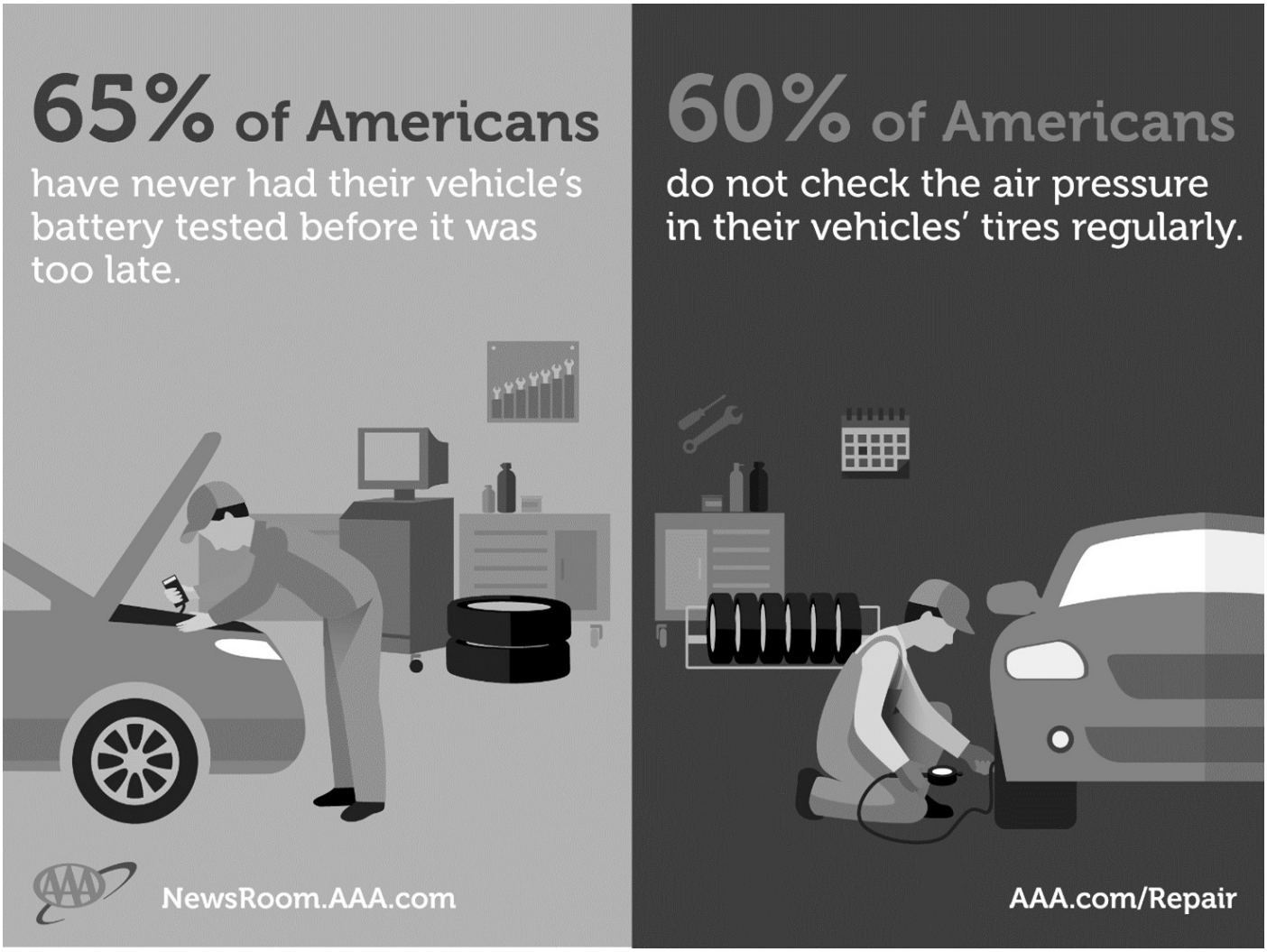
(Spanish Version)

Auto Transmission Repair Work Picture This – Spanish



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

Auto Transmission Repair Work Picture This



Source: *https://www.rallye-stars.com*

HazCom Employer's Guide

Step 2: Identify Responsible Parties

What You NEED To Do

As an employer, you need to identify a single person that is responsible for "owning" the HazCom program. Too many cooks in the kitchen make it very difficult to stay on top of legislated and industry requirements. This person, should be responsible for the following:

• Creating and maintaining an inventory of all hazardous chemicals stored or used within their area of responsibility.

• Ensuring that all hazardous chemicals/products are properly labeled, and that these labels are not removed or defaced.

• Maintaining copies of Safety Data Sheets (SDS) for each hazardous chemical in the workplace, and ensuring that the SDSs are readily available to employees.

• Identifying employees under their supervision who may be exposed to hazardous chemicals under normal operating conditions or in a foreseeable emergency based on hazard assessment.

• Informing employees of: Any operations in their work area where hazardous chemicals are present; the location and availability of the written Hazard Communication Plan; the chemical inventory; SDS; and the requirements of the Hazard Communication Standard.

• Providing employees with training regarding hazards or practices specific to their work area at the time of their assignment and whenever a new hazard is introduced into their work area.

• Maintaining training records through the online database or with Department Supervisors.

• Determine the required personal protective equipment (PPE) for the procedures and materials in use in their area.

• Ensure the proper PPE is made available to employees.

• Ensure the employees are trained in the use of PPE, the PPE is properly maintained, and the employees wear the appropriate PPE where necessary/required.

• Develop safe procedures for work in their areas, as well as written procedures for emergencies.

• Inform outside contractors of chemical (or other) hazards that they may be exposed to while working at your location, while also informing them of the location of the SDSs.

• Inform employees about proper performance of non-routine tasks.

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What Are My Responsibilities?

The answer to that question depends on who you are, and what you do.

Manufacturer/Importer Responsibilities

Manufacturer/Importer Responsibilities

If you manufacture or import chemicals, you're responsible for classifying the hazards of those chemicals. Appendixes A and B of the Standard contain instructions you'll need to do this. Based on that classification, you must then use information included in Appendix C to determine what hazard information, including signal words and pictograms, you'll need to include on labels for all chemical products you ship downstream.

You also need to develop SDSs for all chemical products you import or manufacture. There are 3 circumstances in which you're required to supply SDSs. First, you must supply them with initial shipments of chemical products to downstream users. Second, you must include a new SDS with the next shipment after you revise the SDS for any reason. Third, you must send an SDS whenever requested to do so by a downstream user.

As a manufacturer or importer, you're at the top of the supply chain, and everyone downstream depends upon the accuracy of the shipped labels and SDSs you supply. That's why it's especially important that you get it right!

Distributor Responsibilities

Distributor Responsibilities

The HazCom Standard defines a "distributor" as "a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to employers." Basically, this means that you're a distributor if you receive chemical products

from a primary manufacturer, and then ship them to users downstream.

You're responsible for including shipped labels and SDSs with the chemicals you ship downstream. That means you should stay on top of the chemical suppliers who ship to you in order to make sure they're sending you accurate hazard information for the products they supply.

Employer Responsibilities

Employer Responsibilities

Employers are the end-users of chemicals, and have the important responsibility to ensure that their own employees have the information they need about the hazards of chemicals in the workplace. Remember the discussion about the "bad ole days" before there was a HazCom standard – what a dangerous time it was for workers? OSHA developed employer requirements under the HazCom Standard to help reduce the potential for those situations.

The very beginning of the HazCom standard requires employers to have a "comprehensive HazCom program." But what does that mean, exactly? To meet OSHA's requirements, an employer needs to include these 5 components in their plan:

- *A Written Hazard Communication Program*. Consider this your "playbook" for managing HazCom at your site. That's why it's so important that your program is "site specific." Resist the temptation to just download any old template from the internet and put your company's name and address on it. You need to lay out the details of *your* chemical hazards, *your* storage practices, *your* workplace labeling system (more on that later!) and *your* training program. You also need to make sure this program is accessible to all of your employees, and that they know where to find it.
- *Chemical Inventory List*. Just like the name implies, this is a list of all of the chemical products in your workplace for which you are required to maintain SDSs. You can probably

see the reason why this is a required element – you can't communicate the hazards of chemicals in the workplace to your employees if you don't know what chemicals you have. As you bring new chemicals into the workplace, make sure that the chemical inventory list is kept up to date.

- *Proper Labels and Warnings*. Employers must ensure that shipped labels on incoming containers are not removed or defaced. But there are plenty of containers in the workplace other than the initial shipped containers – including transfer buckets, spray bottles, drip pans beneath equipment, and reservoirs for hydraulic oil and coolant within machines – and OSHA requires you to make sure those containers are labeled, too! Your system for labeling and communicating the hazards of chemicals in these kinds of secondary containers is called workplace labeling.
- *SDSs and Right–to-Know Access.* The whole purpose of the HazCom Standard is to protect workers who are exposed to hazardous chemicals. It shouldn't be a surprise that one of the most central responsibilities of an employer is to ensure their workforce can access the SDSs for chemicals they work with during their workshifts. The key is that they must have access to the exact documents for the exact chemicals they work with, which means you have to maintain the SDS for the chemicals provided by the manufacturer, rather than "generic" SDSs. You also can't have any barriers to access. For example, if you keep your SDS library in a supervisor's office, and that supervisor then goes to lunch and locks her office door, employees would not be able to obtain the SDS in the event of an emergency. A cloud-based SDS management system can help provide the 24/7 you and your workforce need.
- Of course, none of the efforts you make to manage HazCom will bear fruit if your employees don't understand the Standard, or the specific details of your HazCom program. That means you'll need to train them, and more importantly, you'll need to verify that they've understood their training.

Shipping and Receiving

HazCom & Shipping and Receiving

Although S&R employees may not directly use chemicals to perform their job duties, a basic understanding of the known and potential company chemical hazards should be provided. This is necessary in the event containers get damaged during transport or through movement within the building, as well as in storage.

You may have a well-trained chemical response team which cleans up leaking or spilled containers, but your shipping and receiving workers are the first-line of defense in the facility in this regard. And further, storage of many chemicals certainly requires knowledge of incompatible products and conditions to avoid.

As a result, make sure the S&R employees know:

- Pictograms and hazard warnings on labels, packages and placards
- Health and physical hazards classes of common chemicals that may be received or shipped
- Safe handling of flammable liquids and compressed gas cylinders
- Initial response to chemical spills or leaking or broken containers (for example, should they clear the area and summon the chemical response team? Do they know how to call these team members? Are there chemicals that if spilled or leaking, require an automatic limited or full facility evacuation?)
- Incompatible materials, both in spills and in storage
- The health and physical hazards of incompatible materials
- Proper selection and use of PPE that may be necessary when shipping or storing products

In addition to these topics, safe transportation of chemicals and use of secondary containers should be reviewed.

And occasionally, workplaces receive chemicals in error. A driver pulls away and a drum is accidentally left behind sitting on the

dock, and it is not yours. This product could be one that your facility is not familiar with. Until the foreign chemical can be removed from the workplace, it may present a new hazard if it's leaking, or even in normal storage. S&R should be aware how to respond to these events.

Temporary Workers

HazCom and Temporary Workers

Your responsibilities also vary depending on the employment contract of the workers in question.

Typically, the staffing agency and the host employer share training responsibilities for temporary workers. Generic training on the basics of HazCom is often provided to workers by the staffing agency. However, depending on the nature of the site-specific requirements of the workplace or the anticipated job duties, the staffing agency's training may not be sufficient to protect temporary workers fully.

As a recommended practice, work closely with staffing agencies and review the nature and types of training provided. In many cases, you'll need to supplement temporary worker HCS training. As OSHA states, "Many OSHA standards include specific safety and health training requirements to ensure that workers have the required skills and knowledge to safely perform their work." Hazard communication is one such standard that often requires specific information to be relayed to the temporary worker.

As with your other employees, ensure your temporary workers understand:

- How to read SDS, pictograms, and hazard warnings on labels, packages and placards.
- Where to get additional information, such as the location of SDS and supervisors to ask about chemical hazards.
- Health and physical hazards classes of common chemicals they will have exposure to.

- Safe handling and storage of chemicals on the job.
- Signs of exposure to chemicals.
- Selection and use of PPE needed for chemical handling.
- What to do in the event of a chemical emergency, such as a spill or first aid event.

Maintenance Workers

HazCom and Maintenance Workers

Of all employees groups, maintenance often present the biggest challenges in compliance, especially when it comes to chemical exposure. Typically, in small to medium-sized companies, these workers handle a variety of tasks, and your maintenance crew can create or repair almost anything.

This may mean they are using chemicals in non-traditional or inappropriate ways, perhaps welding in the plant near flammable products, or using multiple (and possibly incompatible) chemicals without sufficient ventilation or respirators.

And depending on the nature of your company structure, maintenance workers may also purchase chemicals and bring them into the plant without any tracking process. This can create issues with compliance, as well as safety and health. Safety Data Sheets and chemical inventories often don’t reflect these purchases, and hazards associated with these chemicals might not be included in HCS training.

There are several ways to prevent these types of inadequacies in the HazCom program, including:

- Provide additional HCS training for maintenance workers to reiterate the safe usage of various chemical products, as well as general and job-specific HCS information on labeling, secondary containers, and SDS.
- Perform Job Safety Analysis (JSAs) for routine, and especially, non-routine maintenance duties. For example, the

annual cleaning and preventative maintenance of the boiler, should have JSAs to discover potential chemical hazards, as well as other hazards.
- Create a tracking system to ensure all chemicals purchased are included in the written HCS program and inventory. Instruct maintenance workers on this system.
- Frequently examine the storage of chemical products in the maintenance shop, to ensure they are stored safety and appropriately. Retrain workers, if needed, on this topic.

OSHA's Hazard Communication Standard Ensures the Worker's "Right to Know"

Hazard Communication is meant to be a program that is regularly and consistently used, as it provides several layers of safety for your workers. HazCom compliance is the responsibility of everyone who has known (or potential) exposure to chemical hazards. But this is only possible if everyone understands how to apply the standard to their duties.

HazCom and Training

The HCS shouldn't be gathering dust on the shelf, nor should the HazCom training be a one-and-done method. The foundational aspects of HazCom are an ongoing, daily process for all workers who have known or potential exposure to chemicals in the course of their job duties.

However, often that is not the case. Employees may not grasp the relevance of HazCom in meaningful ways which protect them from chemical health hazards or protect the facility from physical hazards, like fire. OSHA has stated, "An employer's training program is to be a forum for explaining to employees not only the hazards of the chemicals in their work area, but also how to use the information generated in the hazard communication program." In short, workers must know *how to use* what they've learned.

Of course, training for HazCom is required initially, before

workers are exposed to chemical hazards, and additionally, if a new health or physical hazard is introduced. But as HazCom training is not compulsory on an annual basis, workers can easily forget the material and the elements of the standard that keep them safe.

Clearly employers must focus HCS on the workers with obvious hazards, such as those mixing or directly handling chemicals. But other employees in your company likely have potential HCS exposure, too. And some workers might have unusual chemical exposures, by virtue of their job functions.

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HazCom Employer's Guide Step 5: Substitution Plan

What You NEED To Do
Eliminating chemical hazards in the workplace removes the risks they pose. The next best is substituting the hazardous chemical for something non-hazardous or less hazardous. These activities can reduce the costs and work associated with storing and disposing of chemicals and training and equipping employees. It can also reduce liabilities and costs from downtime due to accidents and occupational injuries and illnesses. It is important when substituting chemicals to select safer alternatives and not just swap one harmful agent for another, which could do even more harm to employees and downstream users of products. Download a worksheet for how to select chemical substitutes.

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Chemicals in the workplace lead to over 190,000 illnesses and 50,000 deaths annually in the United States. These shocking statistics, referenced by OSHA on its chemical substitution web

page, stem from a 2006 California Policy Research Center report entitled “Green Chemistry in California: A Framework for Leadership in Chemicals Policy and Innovation.”

Statistics aside, there is a global growing awareness that more can and should be done to safeguard employees, our communities, and the environment from the effects of hazardous chemicals. Chemical substitution has been identified as one of the primary tools for achieving those ends, and on that front, OH&S professionals are uniquely positioned to take the lead.

Understand the Push Toward Chemical Substitution and the Potential Benefits.

There are myriad reasons for transitioning away from hazardous chemicals to safer alternatives. On a basic level, it conforms to the hierarchy of controls, which posits that there is an order in which hazards should be dealt with, with the most effective controls considered first and the least effective controls used when necessary. The controls in order of effectiveness are:

- Elimination
- Substitution
- Engineering controls
- Administrative controls
- Personal protective equipment (PPE)

Looking at these controls through the lens of chemical safety, the order makes sense. Eliminating chemical hazards in the workplace removes the risks they pose. Next best is substituting the hazardous chemical for something non-hazardous or less hazardous. These activities can reduce the costs and work associated with storing and disposing of chemicals and training and equipping employees. It can also reduce liabilities and costs from downtime due to accidents and occupational injuries and illnesses.

It is important when substituting chemicals to select safer alternatives and not just swap one harmful agent for another, which could do even more harm to employees and downstream users of products.

If a company is unable to remove the hazard entirely or minimize it, then it should look next at engineering controls, which physically change the workplace to remove the hazard or place a barrier between the hazard and the worker. Next, it should look at administrative controls that require employer/employee actions to align with new processes that seek to mitigate risks. If a hazard cannot be controlled by the methods described above, then an employer may have to resort to PPE, which is generally considered the least effective method of control.

The benefits of chemical substitution go beyond safety, and a strong business case can be made that chemical substitution benefits include improvements to productivity through gained efficiencies, as demonstrated by the American Industrial Hygiene Association (AIHA) in a 2008 study, “Demonstrating the Business Value of Industrial Hygiene.” These efforts, the study concluded, positively contribute to a company’s bottom line.

Proof of the business case can be seen in the marketplace today: Local, state, federal, and international regulations are mandating the move toward safety alternatives; consumers are demanding safer products and services and are rewarding companies that provide it, and communities are holding business more accountable for their actions; larger downstream companies are mandating safer chemicals and tighter hazard communication protocols from upstream suppliers. In today’s marketplace, sustainability is good business.

Carry Out the Transition to Safer Chemical Alternatives.

OSHA has outlined seven steps it recommends for making the transition successful. Those steps are:

1. Form a team and develop a plan.
2. Examine current chemical use.
3. Identify alternatives.
4. Assess and compare alternatives.
5. Select safer alternatives.

6. Pilot (test) the alternative.
7. Implement and evaluate the alternative.

More specifically, OSHA recommends:

- Getting the right mix of stakeholders together to ensure a comprehensive and successful implementation. With this team, set goals, tasks, and timelines.
- Performing a chemical inventory, making sure to include all chemicals to which employees are exposed and that a safety data sheet is on hand for each.
- Prioritizing chemicals for substitution based upon their intrinsic hazards and potential for exposure. A good electronic SDS management tool can make it easier to search safety data sheets for chemicals of concern, even at the ingredient level. Extremely hazardous chemicals as identified by the EPA, OSHA, and other agencies should be at or near the top of the list.
- Locating alternatives that could replace the chemical in question, including using steps outlined in the hierarchy of controls to abate the chemical hazard.
- Making an informed decision by analyzing the comparable hazard footprints of the alternatives under consideration, including data about hazards, performance, costs, and other factors, and then selecting the best option. The best option will likely include a number of trade-offs, some of which may require new protections to safeguard employees, even though safety as a whole improves.
- Testing and evaluating to ensure that the piloted improvement achieves desired results without complicating matters. This final step is never really finished because chemical hazard abatement is an ongoing process, and new technologies and chemical alternatives are being developed at an accelerated pace.

Why is Substitution Important?

Why is Substitution Important?

Substitution of currently-used materials with less hazardous materials is one of the most effective ways of eliminating or reducing exposure to materials that are toxic or pose other hazards. A hazard is the source of danger or injury. A hazard includes any chemical or material that has the ability or a property that can cause an adverse health effect or harm to a person under certain conditions. Risk, on the other hand, is the probability or chance that exposure to a chemical hazard will actually cause harm to a person or cause an adverse effect.

Other occupational hygiene methods for controlling employee exposure to chemicals include elimination, isolation, enclosure, local exhaust ventilation, process or equipment modification, good housekeeping, administrative controls and personal protective equipment. All these methods reduce or eliminate the risk of injury or harm by interrupting the path of exposure between the hazardous material and the worker. Substitution removes the hazard at the source.

Why Should the Substitute Product be Chosen Very Carefully?

Why Should the Substitute Product be Chosen Very Carefully?

Extreme care must be taken to ensure that one hazard is not being exchanged for another, especially one that could even be a more serious hazard. Before deciding to replace a chemical, one must know what risks the chemical poses to the employees, the environment, the equipment and facilities. If the risks are serious, then alternatives should be considered. A thorough understanding of the potential risks associated to the alternative solution is necessary.

The selection of a substitute can be a very complex process. In

large organizations the selection process may involve a committee with representatives from engineering, purchasing, industrial hygiene, safety, maintenance, research and development, environmental control, waste management, shipping, and the supervisors and workers who directly work with the product. In smaller organizations, one person may carry out many of these functions.

[What are Some Major Considerations to Look at When Considering the Suitability of Potential Substitutes?]

What are Some Major Considerations to Look at When Considering the Suitability of Potential Substitutes?

1. **Effectiveness.** Will the product meet the technical requirements (e.g., solubility, drying time) for the job or process?
2. **Compatibility.** The substitute must not interfere or react with the process, the other products, or the equipment.
3. **Existing Control Measures**. Existing control methods may not adequately control the substitute (e.g., a less toxic substitute may evaporate more rapidly and the existing ventilation system may not adequately capture the vapors).
4. **Waste Disposal**. Will the current waste disposal system meet technical and regulatory requirements when dealing with any new waste created by using the substitute?
5. **Hazard Assessment**. A hazard assessment should be done to decide whether to substitute a chemical or product with a different one.

[What are Some Points to Consider When Doing a Hazard Assessment?]

What are Some Points to Consider When Doing a Hazard Assessment?

Use safety data sheets (SDSs) and other sources of chemical information to compare the hazards of various products. For easier comparison, set up a table with the following categories for each potential substitute. The important properties to compare are:

1. **Vapor Pressure**. Vapor pressure is an indicator of how easily a chemical evaporates into the air. Exposure by inhalation is the primary route of exposure for many products; therefore, the vapor concentration in the air largely influences the potential degree of exposure. If a solvent is not very volatile (does not evaporate easily), the potential for exposure by inhalation may be very low.
2. **Short Term Health Effects.** Biological effects or adverse health effects caused by short-term exposures to high concentrations of a chemical may not be the same as those resulting from low level, long-term exposures. For example, two closely related aromatic hydrocarbons, benzene and toluene, have similar acute toxic properties but only benzene causes cancer following long-term or chronic exposure. Recommended occupational exposure limits such as the American Conference of Government Industrial Hygienist's (ACGIH) Threshold Limit Values (TLVs) must **not** be used in the comparison of materials since the basis for establishing these values varies from substance to substance (e.g., protection from irritation, becoming unconscious, or impairment of health). The TLV booklet clearly states that the TLVs are **not** a relative index of toxicity.
3. **Long-Term Health Effects**. Long term health effects such as chronic lung disease may be more significant than short term health effects.
4. **Skin Toxicity**. Both the potential for direct irritation and allergic sensitization must be examined. One also must consider that, besides breathing in chemicals, some solvents (and even some solvent vapors) can also be absorbed through intact skin. This route of exposure can contribute

significantly to the overall uptake of chemicals in the body.

5. **Sensitization of the Respiratory System**: If repeated exposure to the chemical by inhalation can cause hypersensitive reactions, like an asthma attack, then special exposure control methods and workplace practices should be set up and maintained.
6. **Cancer-Causing Potential and Reproductive Effects.** If there is sufficient evidence that a compound could cause cancer or reproductive effects in humans, special handling precautions need to be considered.
7. **Physical Hazards**. Fire and explosion are sometimes the greatest hazards from a product. Properties that must be examined include vapor pressure, autoignition temperature, flash point, flammability limits, and reactivity.

Although substitution is the most direct method of reducing hazards, it is not always practical. A very careful evaluation must be done before any substitution plan to ensure that the new, alternative chemical does not pose a greater hazard than the currently used product. For example, a less environmentally harmful substance may actually pose a more significant risk for the health of the workers.

What is an Example of the Steps to Take When Investigating a New Product?

What is an Example of the Steps to Take When Investigating a New Product?

The Health and Safety Executive (HSE) in the United Kingdom recommends a seven step process when considering substitution*. These steps include:

1. **Identifying hazards and assessing risks.** This step involves deciding whether the current substance or process is a hazard. Is there a significant risk involved in storing,

using or disposing of a substance? A hazard is defined as "the potential a substance or process has to harm someone or damage the environment." Risk is "how likely this is to happen."

2. **Identifying alternatives**. Investigate a wide range of options. Compare all of the hazard assessment information as previously mentioned in this document. Compare the different states of a chemical (e.g., will a granular form create less dust than a powder form?) Also consider whether the job is necessary or not (e.g., can the part be replaced rather than cleaned). If you are a supplier, you may need to select options according to your customers' needs as well as those of your own employees.
3. **Think about what could happen if you use the alternatives.** It is important that you have gathered all available information before this step so that you can make a realistic comparison of both the good and bad points. Remember that you must also consider the way employees use it and how likely it is that they may be exposed. Choosing an alternative chemical may require changes in:
    - the way the work is done,
    - the kind of equipment or parts (e.g., O-rings, gaskets or hose materials) needed to be compatible with the substitute chemical,
    - the ventilation system that may be required,
    - the disposal methods, and
    - regulatory requirements that may apply.
4. **Comparing alternatives.** In this step, compare the alternatives with each other, and with the substance or process currently being used. HSE recognizes that it is hard to compare the risks of one chemical that is very flammable with one that is very toxic. They recommend thinking of the effects in simple terms such as "Is the substitute going to explode, or poison people? Will it only affect people who work with it, or could it affect other people in the area?" Remember to consider how and where the alternative will be used.
5. **Decide whether to substitute.** This step is the most

difficult. Remember that a change in one step of a process can affect many others. Consult with the workers who will be handling the material directly for their input. It is a good practice to introduce the substitute on a trial or small quantity basis at first.

6. **Introducing the substitute.** Plan the change in material or process carefully. Remember to train and educate the workers involved.
7. **Assessing the change.** Check to see if the substitution has produced the intended results. You may find monitoring the health of the workers, monitoring the level of contaminants in the air, or fulfilling legal requirements useful parameters to measure.

Additional Resources

Additional Resources

- The MADE SAFE Hazard List of Chemicals, Materials & Ingredients
- Hazardous Chemicals Handbook
- OECD Substitution and Alternatives Assessment Toolbox
- Chemsec Marketplace

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HazCom Employer's Guide Step 8: Maintain SDS

What You NEED To Do
An important aspect of the HazCom program is to ensure that someone (e.g., the HazCom Coordinator or a designee) is responsible for obtaining and maintaining the SDSs for every hazardous chemical in the workplace. If an SDS is not received automatically from the distributor, one must be requested as soon as possible. If the request for an SDS does not produce the information needed, the local OSHA area office should be contacted for assistance.

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Paragraph (g) of HazCom 2012 states that employers must have an SDS in the workplace for each hazardous chemical they use.

If an SDS is missing, one must be requested from the distributor. To shows good faith effort to obtain an SDS, it is prudent to document the request (e.g., keep copy of the letter or e-mail; make a note regarding telephone contact). A hazardous chemical for which there is no SDS on file should not be used until the SDS is obtained.

An important aspect of the HazCom program is to ensure that someone (e.g., the HazCom Coordinator or a designee) is responsible for obtaining and maintaining the SDSs for every hazardous chemical in the workplace. If an SDS is not received automatically from the distributor, one must be requested as soon as possible. If the request for an SDS does not produce the information needed, the local OSHA area office should be contacted for assistance.

The SDSs have 16 internationally agreed upon components or sections that contain information for many different audiences (e.g., employers, workers, safety and health professionals, emergency responders, government agencies, and consumers). Consequently, the sections have been organized so that the

information of most use to exposed workers, emergency responders, and others who do not need extensive technical detail is in the beginning of the SDS (Table 5).



For example, a description of a chemical's health effects appears in Section 2 (Hazard identification), but the toxicological data upon which the determination of these effects is based appears in Section 11 (Toxicological information). All of the sections are available to any reader, but there is a difference between what is necessary for a broader audience and what might be needed by others designing protective measures or providing medical services.

The information in some of the sections is non-mandatory because they address information that involves the requirements of other government bodies, and thus they are not under OSHA's jurisdiction. Even though these sections are not considered mandatory by OSHA, the sections are still required. They provide useful information related to ecological, disposal, and transportation-specific issues under the regulatory control of other agencies.

Employers must not only maintain copies of SDSs, they must also ensure that the SDSs are readily accessible to workers during their work shifts. Some employers keep the SDSs in a binder in a central location, others provide access electronically. However, if access to SDSs is provided electronically, there must be an adequate back-up system in place in the event of a power outage, equipment failure, or other emergency involving the primary electronic system.

Familiarity with the information in each section of an SDS will enable both employers and employees to quickly access this information in case of an emergency. A section-by-section description of the information required for each part of the SDS is available in Appendix D of HazCom 2012.

OSHA also developed a QuickCard™ on SDSs (OSHA 3493) available on

the OSHA Hazard Communication website.

The SDSs must be in English, although the employer may maintain copies in other languages.

Software is available to help you easily author SDSs based on required standards, manage and maintain your collection of SDSs as well as access your safely cloud-based safety data sheets at any time.

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HazCom Employer's Guide Step 11: Retrain/Retention

What You NEED To Do
It cannot be stated enough, **your occupational health and safety responsibility to your employees is not that HazCom training is given, it is that HazCom training is understood.** Use knowledge checks and reinforce your training to make sure that employees know their responsibilities and understand what they are required to do as a part of your HazCom program. Click here to assign retraining to your employees. **BACK TO START | NEXT STEP OF 12**

OSHA Citation

Employees are to be trained at the time they are assigned to work with a hazardous chemical. The intent of this provision (1910.1200(h)) is to have information prior to exposure to prevent the occurrence of adverse health effects. This purpose cannot be met if training is delayed until a later date. The training provisions of the HCS are not satisfied solely by giving employee

the data sheets to read. An employer's training program is to be a forum for explaining to employees not only the hazards of the chemicals in their work area, but also how to use the information generated in the hazard communication program. This can be accomplished in many ways (audiovisuals, classroom instruction, interactive video), and should include an opportunity for employees to ask questions to ensure that they understand the information presented to them. Training need not be conducted on each specific chemical found in the workplace, but may be conducted by categories of hazard (e.g., carcinogens, sensitizers, acutely toxic agents) that are or may be encountered by an employee during the course of his duties. Furthermore, the training must be comprehensible. If the employees receive job instructions in a language other than English, then the training and information to be conveyed under the HCS will also need to be conducted in a foreign language.
Reference Interpretation and Compliance Letters:

- The employer must provide the 1910.1200 verbal training in a language that is comprehensible. [04/10/88]
- Training required for clean-up of hazardous waste and hazardous substances. [06/10/91]
- See Also: OSHA Instruction CPL 2-2.38D, Inspection Procedures for the Hazard Communication Standard, 29 CFR 1910.1200, 1915.99, 1917.28, 1918.90, 1926.59, 1928.21; Appendix A, CLARIFICATIONS AND INTERPRETATIONS OF THE HAZARD COMMUNICATION STANDARD (HCS).

What are the Requirements for Refresher Training or Retraining a New Hire?

What are the Requirements for Refresher Training or Retraining a New Hire?

Additional training is to be done whenever a new physical or health hazard is introduced into the work area, not a new chemical. For example, if a new solvent is brought into the workplace, and it has hazards similar to existing chemicals for

which training has already been conducted, then no new training is required. As with initial training, and in keeping with the intent of the standard, the employer must make employees specifically aware which hazard category (i.e., corrosive, irritant, etc.) the solvent falls within. The substance-specific data sheet must still be available, and the product must be properly labeled. If the newly introduced solvent is a suspect carcinogen, and there has never been a carcinogenic hazard in the workplace before, then new training for carcinogenic hazards must be conducted for employees in those work areas where employees will be exposed. It is not necessary that the employer retrain each new hire if that employee has received prior training by a past employer, an employee union, or any other entity. General information, such as the rudiments of the HCS could be expected to remain with an employee from one position to another. The employer, however, maintains the responsibility to ensure that their employees are adequately trained and are equipped with the knowledge and information necessary to conduct their jobs safely. It is likely that additional training will be needed since employees must know the specifics of their new employers' programs such as where the MSDSs are located, details of the employer's in-plant labeling system, and the hazards of new chemicals to which they will be exposed. For example, (h)(3)(iii) requires that employees be trained on the measures they can take to protect themselves from hazards, including specific procedures the employer has implemented such as work practices, emergency procedures, and personal protective equipment to be used. An employer, therefore, has a responsibility to evaluate an employee's level of knowledge with regard to the hazards in the workplace, their familiarity with the requirements of the standard, and the employer's hazard communication program.

Reference Interpretation and Compliance Letters:

- Retraining employees who have been previously trained by another employer. [05/06/88]
- Hospital technicians required to attend HCS training and a clarification of coverage of pharmaceuticals under the HCS. [09/01/89]
- Employers are responsible for training new employees on the

HCS. [05/11/88]

Assign HazCom Training Now

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HazCom Employer's Guide
Step 1: Learn the Standards

What You NEED To Do
As an employer, you are required by law to comply with the following HazCom standards: Hazard Communication, Subpart Z standards, the OSHA Process Safety Management (PSM) standard. You can have a working HazCom policy and procedure, without an incident, and not be compliant and risk fines and civil litigation. Download a model HazCom policy that is compliant and can be quickly edited to use in your workplace; however, it is also critical that you audit your policies & procedures every year, or as needed, to accommodate changes in legislation. **BACK TO START | NEXT STEP OF 12**

A Definition of Hazard Communication

The starting point for compliance is recognizing the 3 principal sources of OSHA chemical safety requirements:

1. The Hazard Communication standard, or HazCom, establishes general safety requirements to ensure that workers exposed to hazardous chemicals are aware of the dangers and how to protect themselves from them;
2. Subpart Z standards covering specific hazardous substances including asbestos, carcinogens, vinyl chloride, cadmium,

lead, benzene, ethylene dioxide, etc.; and

3. The OSHA Process Safety Management (PSM) standard requires employers that manufacture or use highly hazardous chemicals to implement special programs to prevent and respond to incidents involving those chemicals.

When employees work with chemicals, they face a number of health hazards, including irritation, and physical hazards, such as flammability and corrosion. The United States Occupational Safety and Health Administration (OSHA) stipulates that chemical manufacturers and importers must evaluate the hazards of the chemicals with which they deal and pass along that information through labels and safety data sheets. Similarly, any employer with hazardous chemicals in the workplace must design and institute a written hazard communication program, which includes labeling all containers, giving all employees access to safety data sheets, and conducting a training program for all employees who could be exposed to the hazards. OSHA's Hazard Communication Standard (HCS) specifies how to communicate information about the hazards and how to take protective measures.

The HCS ensures employees have the right to know the chemicals to which they are exposed in the workplace and their hazards. Employees not only must have access to the information, but they also must participate in employers' training programs and know how to actively and effectively protect themselves. The Hazard Communication Standard also informs employers about designing and implementing these effective protective programs for employees who could be exposed to hazardous chemicals. OSHA's overall goal is to reduce the number of chemical source illnesses and injuries in workplaces across the nation.

The standard that gave workers the right to know, now gives them the right to understand.

The Hazard Communication Standard (HCS) is now aligned with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). This update to the Hazard Communication Standard (HCS) will provide a common and coherent approach to classifying chemicals and communicating hazard information on labels and

safety data sheets. This update will also help reduce trade barriers and result in productivity improvements for American businesses that regularly handle, store, and use hazardous chemicals while providing cost savings for American businesses that periodically update safety data sheets and labels for chemicals covered under the hazard communication standard.

Hazard Communication Standard

In order to ensure chemical safety in the workplace, information about the identities and hazards of the chemicals must be available and understandable to workers. OSHA's Hazard Communication Standard (HCS) requires the development and dissemination of such information:

- Chemical manufacturers and importers are required to evaluate the hazards of the chemicals they produce or import, and prepare labels and safety data sheets to convey the hazard information to their downstream customers.
- All employers with hazardous chemicals in their workplaces must have labels and safety data sheets for their exposed workers, and train them to handle the chemicals appropriately.

Major changes to the Hazard Communication Standard

- **Hazard classification**: Provides specific criteria for classification of health and physical hazards, as well as classification of mixtures.
- **Labels**: Chemical manufacturers and importers will be required to provide a label that includes a harmonized signal word, pictogram, and hazard statement for each hazard class and category. Precautionary statements must also be provided.
- **Safety Data Sheets:** Will now have a specified 16-section format.
- **Information and training:** Employers are required to train workers on the new labels elements and safety data sheets format to facilitate recognition and understanding.

HazCom Employer's Guide Step 3: Create Hazardous Chemical Inventory

What You NEED To Do
As with any other hazard, the starting point in managing chemical dangers is to identify and assess hazards at your own workplace. Specifically, you must create a hazardous chemical inventory. You've likely already done this, but if not, we've outlined how to get started below or you can download our HazCom Audit and Hazardous Material Inventory Form to get started. **BACK TO START | NEXT STEP OF 12**

How to Create a Hazardous Chemical Inventory

The first stage in complying with the OSHA Hazard Communication Standard is to create a list of all the hazardous chemicals in your workplace.

What To Look For

What you're looking for are "hazardous chemicals," which the HazCom standard defines as any "chemical which is a physical hazard or a health hazard."

"Health hazard" means a chemical for which there's statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees, which includes chemicals which are carcinogens, toxic or highly toxic

agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendix A of the standard provides further definitions and explanations; and Appendix B describes the criteria used to determine whether a chemical is considered hazardous for purposes of the standard.

"Physical hazard" means a chemical for which there's scientifically valid evidence that it's a:

- Combustible liquid;
- Compressed gas;
- Explosive;
- Flammable;
- An organic peroxide;
- An oxidizer;
- Pyrophoric;
- Unstable (reactive); or
- Water-reactive.

Where To Look

The hazardous chemicals inventory can cover either the entire workplace or different work areas. Start by looking at the physical site. Identify chemicals in containers, including pipes, but also think about chemicals generated in the work operations, OSHA explains in its guidelines. For example, welding fumes, dusts, and exhaust fumes are all sources of chemical exposures.

Also look beyond the physical stuff. Examine your purchasing records to identify the kinds of chemicals you have at your workplace. Read labels provided by suppliers for hazard information.

How To Look

The best way to prepare a comprehensive list, according to OSHA guidelines, is to survey the workplace. The guidelines also recommend that you take the "broadest possible perspective when doing the survey."

“Sometimes people think of ‘chemicals as being only liquids in containers. The standard covers chemicals in all physical forms – liquids, solids, gases, vapors, fumes, and mists – whether they are ‘contained’ or not.” The hazardous nature of the chemical and the potential for exposure are the factors which determine whether a chemical is covered. If it’s not hazardous, it’s not covered. If there is no potential for exposure (e.g., the chemical is inextricably bound and cannot be released), the rule does not cover the chemical.”

What To Do Next

Once you compile your list, verify that you have Safety Data Sheets (SDSs) for each of them. Check your files against your inventory. If any are missing, contact your supplier and request one. Make a written record documenting such requests, either by copy of a letter or a note regarding telephone conversations.

If you have SDSs for chemicals that are not on your list, figure out why. Maybe you don’t use the chemical anymore. Or maybe you missed it in your survey. Some suppliers do provide SDSs for products that are not hazardous. These do not have to be maintained by you.

6 Reasons to Create a Hazardous Chemicals Inventory

6 Reasons to Create a Hazardous Chemicals Inventory

1. OSHA Says You Have To

The HazCom standard requires employers to implement a written hazard communication program at their worksite. Under Sec. 1910.1200(e)(1)(i)), the program must include a list of hazardous chemicals at the site.

2. It’s Crucial to Hazard Assessment and Program Development

The list isn’t just a piece of paper; it’s a hazard assessment. The list is an inventory of *all* hazardous chemicals in the workplace at a given point in time. You can then group these

substances into major hazard classes, such as flammable, corrosive, toxic and reactive. By mapping out the key chemical hazards in your workplace, the inventory then becomes the point of departure for creating a written hazard communication program appropriate to deal with these hazards.

3. It Helps You Comply With SDS Requirements

The inventory is a tool that helps you comply with the requirement (Section 1910.1200(g)(1)) of ensuring that there's an appropriate, up-to-date SDS for each hazardous chemical in your workplace.

4. It Helps You Comply With Training Requirements

The inventory also helps you comply with HazCom training requirements because it maps out the hazardous chemicals to which your employees are exposed and require safety training and education to deal with..

5. Helps Identify and Correct Supply Problems

Inventories can help you identify potential hazardous chemical supply problems or inefficiencies and that you can proceed to correct. For example, the inventory might reveal an opportunity to store smaller quantities of a hazardous chemical by consolidating storage locations or to streamline your ordering process so that an employee can't inadvertently order a particular product for which ample supplies already exist in different storage sites.

6. Makes It Easier to Consider Less Hazardous Substitutes

Conducting a hazardous chemicals inventory gives you the chance to consider replacing current products with substitutes that are less dangerous to worker health and safety as well as the environment.

Conclusion: Inventory Is a Work in Progress

Keep in mind that conducting an inventory just gives you a snapshot of the hazardous chemicals in your workplace *at a given time*. Changes in operations may lead to the elimination of some

hazardous chemicals and the introduction of new ones. So establish a method for ensuring that the inventory is reviewed and updated at least once a year. In addition, develop a method for adding new chemicals the first time they're used in the workplace.

BACK TO START | **NEXT STEP**

HazCom Employer's Guide Step 4: Source SDS

What You NEED To Do
The HazCom standard requires employers to ensure that each hazardous chemical used in the workplace have a safety data sheet, or SDS. Your supplier should provide you an SDS for each chemical. You can use SDS Search to search and download any missing SDS. You may also want to download our infographic on how to read an SDS or make use of our instructor-led or online training on the Globally Harmonized System (GHS) and how to engage with SDSs. **BACK TO START** | **NEXT STEP OF 12**

What is an SDS?

Safety Data Sheets (SDSs) are summary documents that provide information about the hazards of a product and advice about safety precautions. SDSs are usually written by the manufacturer or supplier of the product. In some circumstances, an employer may be required to prepare an SDS (e.g., when the product is produced and used exclusively in that workplace).

SDSs provide more detailed hazard information about the product than the label. They are an important resource for workplaces and workers to help you learn more about the product(s) used. Use this

information to identify the hazards of the products you use and to protect yourself from those hazards, including safe handling and emergency measures.

SDSs tell users what the hazards of the product are, how to use the product safely, what to expect if the recommendations are not followed, how to recognize symptoms of exposure, and what to do if emergencies occur.

Do I Need an SDS?

Do I Need an SDS?

OSHA only requires safety data sheets (SDSs) for hazardous products or chemicals. GLT Products, along with other manufacturers are not required to provide SDSs for non-hazardous materials or products. OSHA has left it up to the producer whether or not they should provide SDSs for non-hazardous materials. Many organizations often supply SDSs for liability purposes, not for compliance. In fact, OSHA **does not encourage** manufacturers to maintain SDSs for non-hazardous products or chemicals.

HCS 2012 defines a health hazard as:

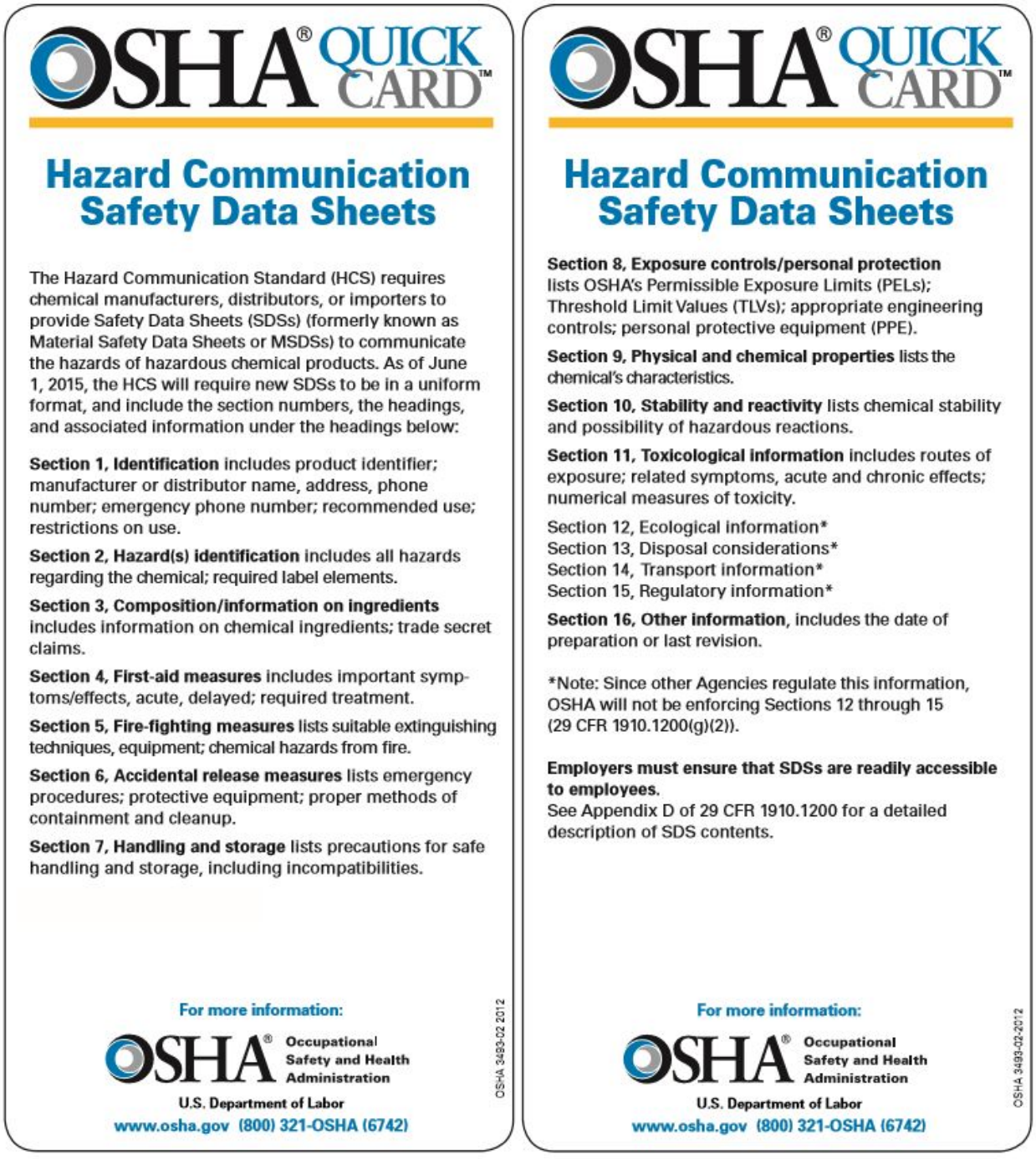
"…a chemical which is classified as posing one of the following hazardous effects: acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenicity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); or aspiration hazard. The criteria for determining whether a chemical is classified as a health hazard are detailed in Appendix A to §1910.1200 – Health Hazard Criteria.

HCS 2012 defines a physical hazard as:

"…a chemical that is classified as posing one of the following hazardous effects: explosive; flammable (gases, aerosols, liquids,

or solids); oxidizer (liquid, solid or gas); self-reactive; pyrophoric (liquid or solid); self-heating; organic peroxide; corrosive to metal; gas under pressure; or in contact with water emits flammable gas. See Appendix B to §1910.1200 – Physical Hazard Criteria.

We encourage everyone to click here to view the full details of OSHA's rules on Hazard Communication Standards.



OSHA® QUICK CARD™

Hazard Communication Safety Data Sheets

The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products. As of June 1, 2015, the HCS will require new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below:

Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements.

Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.

Section 4, First-aid measures includes important symptoms/effects, acute, delayed; required treatment.

Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.

Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.

Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.

For more information:

OSHA® Occupational Safety and Health Administration

U.S. Department of Labor

www.osha.gov (800) 321-OSHA (6742)

OSHA 3493-02 2012

OSHA® QUICK CARD™

Hazard Communication Safety Data Sheets

Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).

Section 9, Physical and chemical properties lists the chemical's characteristics.

Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.

Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

Section 12, Ecological information*
Section 13, Disposal considerations*
Section 14, Transport information*
Section 15, Regulatory information*

Section 16, Other information, includes the date of preparation or last revision.

*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15 (29 CFR 1910.1200(g)(2)).

Employers must ensure that SDSs are readily accessible to employees.
See Appendix D of 29 CFR 1910.1200 for a detailed description of SDS contents.

For more information:

OSHA® Occupational Safety and Health Administration

U.S. Department of Labor

www.osha.gov (800) 321-OSHA (6742)

OSHA 3493-02-2012

As of June 2015, the Hazard Communication Standard (HCS) now requires pictograms on labels to alert users of the chemical hazards to which they may be exposed to. Displayed below are

pictograms of the symbols that represent a distinct hazard(s). The pictogram on the label is determined by the chemical hazard classification.



The simple fact to keep in mind is that if it is a hazardous chemical or product, a safety data sheet **will be required**. If it is a manufactured product, the odds of an SDS existing may be slim.

[What information is on the SDS?]

What information is on the SDS?

The *Hazardous Products Regulations* (HPR) specifies the sections and content for the SDS. Schedule 1 within the HPR outlines the

section number and heading that must be presented in the specified order, as follows:

SDS Section and Heading		Specific Information Elements
1	Identification	• Product identifier (e.g. Product name) • Other means of identification (e.g. product family, synonyms, etc.) • Recommended use • Restrictions on use • Canadian supplier identifier+ - Name, full address and phone number(s) • Emergency telephone number and any restrictions on the use of that number, if applicable++
2	Hazard identification	• Hazard classification (class, category or subcategory) of substance or mixture or a description of the identified hazard for Physical or Health Hazards Not Otherwise Classified • Label elements: - Symbol (image) or the name of the symbol (e.g., flame, skull and crossbones) - Signal word - Hazard statement(s) - Precautionary statement(s) • Other hazards which do not result in classification (e.g., molten metal hazard)

3	Composition/Information on ingredients	• When a hazardous product is a material or substance: - Chemical name - Common name and synonyms - Chemical Abstract Service (CAS) registry number and any unique identifiers - Chemical name of impurities, stabilizing solvents and/or additives* • For each material or substance in a mixture that is classified in a health hazard class**: - Chemical name - Common name and synonyms - CAS registry number and any unique identifiers - Concentration NOTE: Confidential business information rules can apply
4	First-aid measures	• First-aid measures by route of exposure: - Inhalation - Skin contact - Eye contact - Ingestion • Most important symptoms and effects (acute or delayed) • Immediate medical attention and special treatment, if necessary
5	Fire-fighting measures	• Suitable extinguishing media • Unsuitable extinguishing media • Specific hazards arising from the hazardous product (e.g., hazardous combustion products) • Special protective equipment and precautions for fire-fighters

6	Accidental release measures	• Personal precautions, protective equipment and emergency procedures • Methods and materials for containment and cleaning up
7	Handling and storage	• Precautions for safe handling • Conditions for safe storage (including incompatible materials)
8	Exposure controls/ Personal protection	• Control parameters, including occupational exposure guidelines or biological exposure limits and the source of those values • Appropriate engineering controls • Individual protection measures (e.g. personal protective equipment)

9	Physical and chemical properties	• Appearance (physical state, colour, etc.) • Odor • Odor threshold • pH • Melting point/Freezing point • Initial boiling point/boiling range • Flash point • Evaporation rate • Flammability (solid; gas) • Lower flammable/explosive limit • Upper flammable/explosive limit • Vapor pressure • Vapor density • Relative density • Solubility • Partition coefficient – n-octanol/water • Auto-ignition temperature • Decomposition temperature • Viscosity
10	Stability and reactivity	• Reactivity • Chemical stability • Possibility of hazardous reactions • Conditions to avoid (e.g., static discharge, shock, or vibration) • Incompatible materials • Hazardous decomposition products

11	Toxicological information	Concise but complete description of the various toxic health effects and the data used to identify those effects, including: • Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact) • Symptoms related to the physical, chemical and toxicological characteristics • Delayed and immediate effects, and chronic effects from short-term and long-term exposure • Numerical measures of toxicity, including acute toxicity estimates (ATEs)
12	Ecological information***	• Ecotoxicity • Persistence and degradability • Bioaccumulative potential • Mobility in soil • Other adverse effects
13	Disposal considerations***	Information on safe handling for disposal and methods of disposal, including any contaminated packaging
14	Transport information***	• UN number • UN proper shipping name • Transport hazard class(es) • Packing group • Environmental hazards • Transport in bulk, if applicable • Special precautions
15	Regulatory information***	Safety, health and environmental regulations specific to the product

16	Other information	Date of the latest revision of the SDS

[When is the SDS Updated?]

When is the SDS Updated?

SDSs are required to be accurate at the time of sale. An SDS will be required to be updated when the supplier becomes aware of any "significant new data". The definition of "significant new data" is:

New data regarding the hazard presented by a hazardous product that change its classification in a category or subcategory of a hazard class, or result in its classification in another hazard class, or change the ways to protect against the hazard presented by the hazardous product.

This definition means that an SDS must be updated when there is new information that changes how the hazardous product is classified, or when there are changes to the way you will handle or store or protect yourself from the hazards of the product.

SDSs will be required to be updated within 90 days of the supplier being aware of the new information. If you purchase a product within this 90 day time period, the supplier must inform you of the significant new data and the date on which it became available in writing.

[As an Employer, Do I Have Responsibilities for SDSs?]

As an Employer, Do I Have Responsibilities for SDSs?

Yes. Employers will be required to make sure that all hazardous products have an up-to-date SDS when it enters the workplace. The

SDSs must be readily available to the workers who are exposed to the hazardous product, and to the health and safety committee or representative.

Employers may computerize the SDS information as long as:

- all employees have access to and are trained on how to use the computer or device,
- the computers/devices are kept in working order, and
- the employer makes a hard copy of the SDS available to the employee or health and safety committee/representative upon request.

As mentioned, in some circumstances, an employer may be required to prepare an SDS (e.g., when the product is produced and used in the workplace).

[As a Worker, When Would I Use an SDS?]

As a Worker, When Would I Use an SDS?

Always be familiar with the hazards of a product **before** you start using it. You should look at an SDS, match the name of the product on the container to the one on the SDS, know the hazards, understand safe handling and storage instructions, as well as understand what to do in an emergency.

You can think of the SDS as having four main purposes. It provides information on:

a. **Identification**: for the product and supplier.
b. **Hazards:** physical (fire and reactivity) and health.
c. **Prevention:** steps you can take to work safely, reduce or prevent exposure, or in an emergency.
d. **Response**: appropriate responses in various situations (e.g., first-aid, fire, accidental release).

For most people who work with hazardous products, you should always:

- read the name of the chemical (Section 1),
- know the hazards (Section 2),
- understand safe handling and storage instructions (Section 7), and
- understand what to do in an emergency (Sections 4, 5 and 6).

A few things to know:

- Make sure that the product is being used in the way the manufacturer intended; otherwise the advice provided on the SDS and label may not apply, or the protective measures listed may not be adequate. Section 1 of the SDS should describe the typical use of the product and may indicate restrictions. Ask your supervisor or a health and safety professional for advice if the way you use the product does not match the SDS.
- Section 2 will summarize the hazards related to the product, precautions to take, and what to do in an emergency. Understand that the SDS covers information about the potential hazards, but may not be specific about the required safe work procedures needed for your workplace (e.g., the SDS may not specify what type of respirator must be used, just that a respirator is needed). More information can be found by asking your supervisor. These decisions may require the help of a safety professional or someone with chemical safety knowledge.

Additional Resources

Additional Resources

- OSHA's Hazardous Chemicals in Labs Fact Sheet (270 K PDF download).
- OSHA's page on chemical hazards and toxic substances including recognition, evaluation, controls, standards and more.
- OSHA Occupational Chemical Database. OSHA's premier one-stop

shop for occupational chemical information. It compiles information from several government agencies and organizations. Information available on the pages includes chemical identification and physical properties, exposure limits, sampling information, and additional resources.

- Occupational Health Guidelines for Chemical Hazards. U.S. Department of Health and Human Services (DHHS), National Institute for Occupational Safety and Health (NIOSH) Publication No. 81-123, (January 1981). Provides a table of contents of guidelines for many hazardous chemicals. The files provide technical chemical information, including chemical and physical properties, health effects, exposure limits, and recommendations for medical monitoring, personal protective equipment (PPE), and control procedures.
- Where to find Safety Data Sheets on the Internet. Interactive Learning Paradigms Incorporated (ILPI). Provides links to SDS available on the Internet.

BACK TO START | **NEXT STEP**

HazCom Employer's Guide
Step 9: Hazcom Training

What You NEED To Do

OSHA's 1910.1200 Hazard Communication Standard, commonly referred to as HazCom, are rules and regulations in place to ensure workers are informed of any chemical hazards they may encounter while on the job. The HazCom standard requires organizations have proper container labeling and safety data sheets to communicate the potential dangers the chemicals pose and what to do in the event of an emergency. As such, a critical part of OSHA's HazCom requirements is that employers need to provide employees with proper training on how to remain safe when working with hazardous chemicals. Click here to assign HazCom training now.

BACK TO START | NEXT STEP OF 12

When is HazCom training required?

HazCom training should occur at the time of an employee's initial assignment, and whenever a new chemical is introduced into their work area. It is not required to be re-administered annually.

While OSHA does not specify a particular format for such training, organizations should always aim for the most effective training format for the topic at hand. It's also important to remember that in addition to employee training, HazCom standards require chemical-specific information to always be available through labels and safety data sheets.

What does HazCom training need to cover?

The training can cover categories of hazards (e.g. carcinogenicity) or specific chemicals, but OSHA outlines several key topics that need to be included. For example, employees must be trained in the methods used to detect the presence of the hazardous chemicals in the work area. This includes how to read monitoring devices, as well as the visual appearance or odor when chemicals are released.

HazCom training must also include the various hazards that may result due to unprotected exposure to chemicals. This ranges from potential physical and health hazards, to more specific combustible dust and pyrophoric gas hazards. Any hazards that are

not otherwise classified but may still pose a risk due to the presence of a chemical, must also be included. Furthermore, it is critical employees are trained in the measures they can take to protect themselves from these hazards. Any specific safety procedures that an organization has implemented to protect employees from exposure to hazardous chemicals should also be covered during HazCom training.

Finally, OSHA requires organizations to train employees in the details of their hazard communication program. Training should cover the explanation of chemical labels, the workplace's labeling system, safety data sheet (SDS), and the how employees can obtain and use appropriate hazard information.

What happens if you don't comply with HazCom standards?

Any organizations found to be noncompliant with HazCom Standards will face severe fines for endangering their employees. OSHA categorizes failure to abide by HazCom Standards as a "willful" violation, which as of 2022 can result in a fine of up to $145,027 per violation, with this number to be adjusted for inflation each year. Violations can range from improper posting of safety data sheets to inadequate employee training in hazard communication.

The most efficient way to ensure HazCom Standards are being followed is to have a system that compiles all the necessary training data to be reviewed and tracked.

Assign HazCom Training Now

BACK TO START | **NEXT STEP**

HazCom Employer's Guide Step 10: Quiz/Knowledge Checks

What You NEED To Do
Your occupational safety and health responsibility to your employees is not that HazCom training is given, it is that HazCom training is understood. Use knowledge checks and reinforce your training to make sure that employees know their responsibilities and understand what they are required to do as a part of your HazCom program. **BACK TO START** | **NEXT STEP OF 12**

Both workers and employers have a responsibility to work together when it comes to safety in the workplace.

Your responsibility as an employer doesn't stop once the training session is completed, you need to ensure the training is absorbed.

Research in cognitive science and psychology shows that **testing**, done right, can be an exceptionally effective way to **learn**. Taking **tests**, as well as engaging in well-designed activities before and after **tests**, can produce better recall of facts—and deeper and more complex understanding—than an education without exams.

Of course, all of Safety *OnDemand* training includes quizzes and knowledge checks throughout the training, but here are some additional resources you can use to conduct some HazCom quizzes:

- OSHA Pretest
- OSHA Post Test
- HazCom Questions and Answers
- OSHA HazCom Pictogram Challenge
- Hazard Communication Quizzes & Trivia
- GHS quiz: Match the pictogram to the hazard
- Hazard Communication Quiz