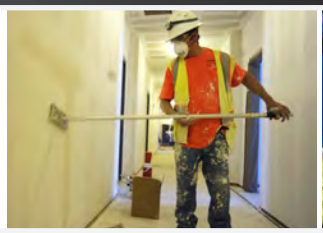
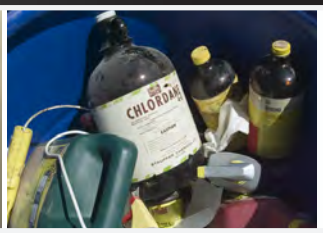
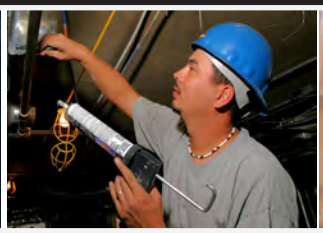
Capacitación en Comunicación de Riesgos

Curso en cumplimiento de la norma 29 CFR1910.1200

MANUAL del Participante

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Este programa de capacitación fue desarrollado originalmente para CPWR - El Centro para la Investigación y Capacitación en Construcción por Mizula, LLC de Hollis, NH y Lippy Group, LLC de Baltimore, MD. Esta versión actual del programa de capacitación, que incorpora hojas de datos de seguridad actualizadas, fue producida por CPWR - El Centro para la Investigación y Capacitación en la Construcción.

Expresiones de Gratitud:

CPWR desea agradecer a las siguientes personas y organizaciones por su contribución a este trabajo:

- James August, MPH
- Jonathan Rosen, CIH
- Mike Cooper, CIH, CSP, MPH
- Andrew Kingston
- Darrel VanWagner
- Bruce Lippy, Ph.D., CIH, CSP
- Bernard Mizula, CIH

Tabla de Contenido

Capacitación en Comunicación de Riesgos

En cumplimiento de la norma 29 CFR1910.1200

Para romper el hielo

Dentro de su grupo (o con toda la clase) hable sobre las sustancias químicas a las que está expuesto en su trabajo y sobre el daño que ocasionan. ¿Conoce algún incidente provocado por una sustancia química?

Este curso consta de 8 secciones:

1. Introducción del curso
2. Aspectos generales de la norma de comunicación de riesgos (HCS)
3. Análisis de los efectos comunes sobre la salud
4. Aspectos químicos
5. Medición y límites de exposición
6. Otras maneras de comunicar riesgos
7. Control de riesgos
8. Emergencias y primeros auxilios

Al terminar este curso, usted podrá:

Figura 1. Instructor de albañilería revisando una ficha de datos de seguridad.

1. Hablar de los cinco elementos principales de la norma de comunicación de riesgos de OSHA (Hazcom).
2. Describir los derechos que le otorga la norma de comunicación de riesgos (Hazcom) de OSHA.
3. Identificar los nuevos símbolos de etiquetado de OSHA y explicar lo que significa cada uno de ellos.
4. Describir las cuatro vías de penetración de las sustancias químicas en el cuerpo. Por cada una de las vías, dar un ejemplo de una sustancia conocida por penetrar a través de ella.
5. Especificar tres maneras de buscar información sobre las sustancias químicas que se pueden encontrar en su lugar de trabajo.
6. Describir distintos métodos para controlar la exposición a sustancias químicas y ordenarlos según el nivel de protección que ofrecen a los trabajadores.
7. Usar una hoja de datos de seguridad de un producto, determinar si es inflamable, si es más pesado que el aire y si tiene un Límite de exposición permisible (PEL)* de OSHA.

*Todas las siglas que se utilizan en esta traducción son siglas en inglés.

Sección 1: Introducción del Curso

La norma de comunicación de riesgos de OSHA (Hazcom) le otorga el derecho de entender los riesgos químicos que puede encontrar en el trabajo, y aprender las maneras de protegerse.

Lo que este curso no incluye

Este curso no incluye capacitación para limpiar derrames ni emanaciones.

Si usted cree que está en una situación de emergencia, siga el plan para casos de emergencia de su empleador, dispóngase a evacuar el área y notifíquele a la persona autorizada para responder. Si su empleador no tiene un plan para casos de emergencia, dígale a sus compañeros de trabajo que abandonen el área y notifique al primer supervisor que pueda.

Este curso tampoco da instrucción sobre los riesgos químicos específicos de su lugar de trabajo. Eso es responsabilidad de su empleador.

La capacitación sobre la norma Hazcom lo preparará para buscar y usar información sobre las sustancias químicas que puede encontrar en su trabajo. Además, lo preparará para identificar derrames y emanaciones y para saber cómo dar aviso al personal cualificado en casos de emergencia.

Actividad 1: Compruebe el conocimiento que tiene su grupo sobre Hazcom

Duración de la actividad: 10 minutos (5 para el trabajo en grupo y 5 para informar los resultados)

Objetivo: El objetivo de esta actividad es permitirle al instructor determinar qué nivel de conocimiento tienen los asistentes.

Tarea: Trabajar en grupo para responder las preguntas. El instructor analizará las respuestas correctas.

Verdadero o Falso

1. La norma obliga a todos los empleadores a dar a sus empleados información sobre las sustancias químicas peligrosas a las que están expuestos. _____
2. Los empleadores tienen la obligación de dar a los trabajadores una hoja de datos de seguridad (SDS) en el turno laboral que corresponda. _____
3. Los que iniciaron la norma de comunicación de riesgos de OSHA fueron los importadores, fabricantes y distribuidores de sustancias químicas porque les preocupaba la responsabilidad que pudiera recaer sobre ellos. _____
4. Los empleadores están obligados a ofrecer anualmente capacitación en comunicación de riesgos. _____

Llene el espacio en blanco usando las respuestas a la derecha.

5. ¿Cuántos trabajadores mueren cada año por causa de lesiones ocupacionales? _____
6. ¿Cuántos trabajadores mueren cada año por causa de enfermedades ocupacionales causadas por exposición química? _____
7. ¿Cuántas normas exclusivamente químicas hace cumplir OSHA? _____
8. ¿Cuántos productos químicos se usan en el lugar de trabajo? _____

Respuestas

a. 500
b. 5,000
c. 10,000
d. 50,000
e. > 50,000

Cada día alrededor de cuatro trabajadores de la construcción mueren en el trabajo.

El siguiente mapa ilustra las muertes en obras de construcción en el año 2025 según los datos recabados por CPWR:

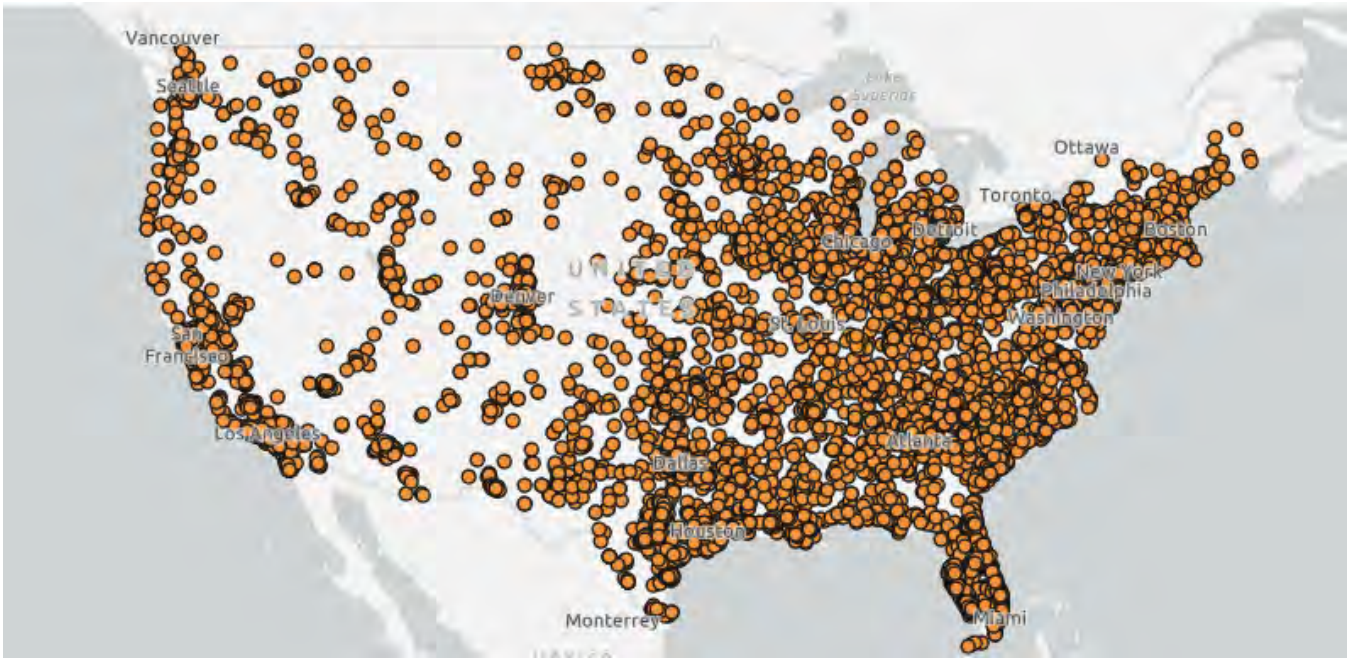

Figura 2

Sección 2: Resumen de la norma de Comunicación de Riesgos.

¿Qué motivó a OSHA a establecer la norma Hazcom en 1983?

En 1952 y 1969, el río Cuyahoga ardió en fuego. Para ser más exactos, al menos 13 incendios habían sido reportados en el río Cuyahoga a principios de 1868. El incendio más grande del río ocurrió en 1952 y causó más de un millón de dólares en daños a barcos y un edificio administrativo que se encontraba a la orilla del agua. Muchos incendios adicionales se registraron antes del 22 de junio de 1969, cuando uno de ellos acaparó la atención de la revista Time, que describía a Cuyahoga como el río que “supura, no fluye” y en el cual una persona “no se ahoga, se descompone”. El incendio de 1969 del río Cuyahoga ayudó a promover una gran cantidad de actividades de control de la contaminación del agua, que dieron origen a la Ley de Agua Limpia (Clean Water Act) y la creación de la Agencia de Protección Ambiental (Environmental Protection Agency) del gobierno federal de Estados Unidos. (Fuente: Wikipedia)

Sindicatos y grupos ambientalistas se pusieron a la cabeza de la lucha para la protección contra las sustancias químicas peligrosas.

En 1977, 60 trabajadores de una planta química en California que fabricaba el pesticida DBCP (1,2-dibromo-3-cloropropano) manifestaron síntomas de esterilidad. Durante los periodos de almuerzo y receso, los empleados conversaban sobre los problemas de comenzar una familia. Empezaron a observar que ninguno de los empleados de un área en particular podía tener hijos. Los afectados fueron a ver al médico y los resultados indicaron que todos padecían de esterilidad. Varios años antes, un investigador de la Universidad de California había encontrado que el DBCP era un peligro para la reproducción. Esa información era del dominio público, pero a los trabajadores nunca se les informó de la existencia de ese riesgo. Ellos tuvieron la dicha de que los efectos no fueron de largo plazo. El caso del DBCP abrió paso a las audiencias legislativas que dieron lugar a que el estado de California aprobara un nuevo decreto del Código Laboral de California en 1981. El decreto se conoce comúnmente como la Regulación de Comunicación de Riesgos (Hazard Communication Regulation). La nueva regulación exigía que el Departamento de Relaciones Industriales de California creara una lista de sustancias peligrosas. Además, exigía que los fabricantes prepararan hojas de datos de seguridad de materiales (SDS) para las sustancias peligrosas fabricadas por ellos y que proporcionaran una copia de las SDS a los empleadores que les compraban las sustancias peligrosas.

Las leyes estatales relativas al “derecho de saber” dieron origen a la primera norma Hazcom de OSHA en 1983

¿Por qué es importante la norma de comunicación de riesgos? (Hable del tema con su grupo.)

32 millones de trabajadores están potencialmente expuestos a sustancias químicas, según OSHA.

Aproximadamente un cuarto de las enfermedades y lesiones que se originan en el trabajo son provocadas por sustancias químicas, según la Organización Internacional del Trabajo.

Hazcom fue la segunda norma más citada en el año fiscal 2017. Se registraron 4,176 citaciones.

La Hazard Communication Standard, también se conoce como:

- Hazcom o HCS
- Norma de Comunicación de Riesgos, Norma sobre Comunicación de Riesgos, Norma de Comunicación de Peligros
- Right to Know o Derecho de saber
- OSHA 29 CFR 1910.1200
- OSHA 29 CFR 1926.59 (construcción)

OSHA describe la HCS como una norma orientada en gran medida al rendimiento que da a los empleadores la flexibilidad de adaptar las reglas a las necesidades propias de cada lugar de trabajo, en lugar de tener que cumplir requisitos específicos y rígidos. La Norma de Comunicación de Riesgos (HCS) está basada en un concepto sencillo: los trabajadores tienen la necesidad y el derecho de conocer la identidad de las sustancias químicas a las que se ven expuestos y los riesgos asociados con ellas. También necesitan conocer qué medidas de protección están disponibles para evitar los efectos adversos. La HCS está diseñada para dar a los empleados la información que necesitan.

El conocimiento adquirido a través de la HCS ayuda a los empleadores a facilitar un lugar de trabajo más seguro para sus trabajadores. Cuando los empleadores tienen información sobre las sustancias químicas que se están utilizando, pueden tomar medidas para reducir la exposición, pueden sustituirlas por otros materiales menos dañinos y establecer prácticas laborales adecuadas. Estos esfuerzos ayudan a evitar enfermedades y lesiones en el trabajo por causa de las sustancias químicas.

La HCS trata sobre la evaluación de los riesgos y la comunicación de los hallazgos a los trabajadores. La evaluación requiere el juicio profesional de expertos en la materia. Por eso, la HCS está hecha para que los empleadores no tengan la necesidad de evaluar los riesgos de esas sustancias. Los empleadores no son los que producen ni importan las sustancias químicas, son los que las usan. La determinación del riesgo es responsabilidad de los productores e importadores de los materiales, quienes a su vez tienen la obligación de ofrecer la información de los riesgos a los empleadores que compran sus productos.

Los empleadores (que no producen ni importan sustancias químicas) solo tienen que fijarse en las partes de la regla que tienen que ver con establecer un programa en el lugar de trabajo y comunicar la información a sus trabajadores. Este curso es una guía general para ese tipo de empleador que puede ayudar a determinar las exigencias de la norma. El curso no es para sustituir los requisitos reglamentarios, sino más bien es como un resumen de los pasos que un empleador puede seguir en cumplimiento de esos requisitos.

OSHA tiene una norma Hazcom dirigida a la construcción, la norma 1926.59, pero es idéntica a la 1910.1200.

La norma completa dice así: “Los requisitos aplicables al trabajo de la construcción conforme a esta sección son idénticos a los estipulados en la 1910.1200”.

OSHA revisó esta norma para que formara parte del Global Harmonization System (GHS), que entró en vigor el 25 de mayo de 2012.

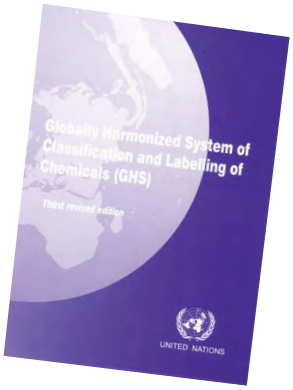

Figura 3

El GHS, adoptado en un principio por el Subcomité del Sistema globalmente armonizado de clasificación y etiquetado de productos químicos (GHS, en inglés) en diciembre de 2002, es una iniciativa que persigue establecer un consenso internacional sobre los criterios para clasificar los riesgos químicos, con distribución internacional, y para crear requisitos uniformes para las hojas de datos de seguridad. Es una práctica común para definir y clasificar riesgos y comunicar información en las etiquetas y las hojas de datos de seguridad. Existen 16 secciones en las hojas de datos de seguridad. El GHS sirve de base para establecer programas de seguridad química completos y en todo el territorio nacional. El público al que va dirigido incluye trabajadores, consumidores, trabajadores del transporte y especialistas en casos de emergencia.

OSHA permitió un período de introducción gradual para los requisitos.

- 1º de diciembre de 2013: los empleadores deben ofrecer a los trabajadores capacitación en las nuevas etiquetas y el nuevo formato de las hojas de datos de seguridad o SDS
- 1º de junio de 2015: fabricantes, importadores y empleadores deben poner todas las disposiciones en práctica, excepto:
- 1º de diciembre de 2015: deben usarse etiquetas de envío/transporte conforme al Sistema globalmente armonizado de clasificación (GHS)
- 1º de junio de 2016: los empleadores deben implementar sus programas de Hazcom actualizados

¿Por qué se creó el GHS?

¿Cuáles son los cinco elementos clave de la norma Hazcom de OSHA?

1. Los empleadores deben contar con un programa Hazcom escrito.
2. Los recipientes deben estar etiquetados y las etiquetas deben seguir un formato uniforme.
3. Las sustancias peligrosas deben tener sus SDS correspondientes en el lugar de trabajo.
4. Los trabajadores deben ser capacitados.
5. Los empleadores deben mantener un inventario actualizado de las sustancias químicas.

Los programas Hazcom deben estar constituidos de todas las partes siguientes:

Figura 4

Programa escrito de comunicación de riesgos, primer requisito indispensable de la Norma Hazcom de OSHA, 1910.1200 (e)

¿Qué es un programa Hazcom?

Los empleadores deben elaborar, impartir y mantener en el lugar de trabajo un programa completo (y escrito) de comunicación de riesgos. El programa es el método que el empleador puede utilizar para cumplir los requisitos de un reglamento en particular, en este caso, el reglamento de comunicación de riesgos conocido como Hazcom. Los trabajadores tienen el derecho de revisar el programa Hazcom durante las horas de trabajo y hacer todas las preguntas que surjan. Un programa escrito de comunicación de riesgos asegura que todos los empleadores puedan recibir la información que necesitan para informar y capacitar a sus trabajadores correctamente, además de diseñar y poner en práctica programas de protección de los trabajadores. También ofrece toda la información de riesgos necesaria a los empleados con el objeto de que puedan participar y dar su apoyo a las medidas de protección existentes en sus lugares de trabajo.

Con frecuencia, hay más de un empleador involucrado al mismo tiempo en una obra de construcción. En ese caso, todos los empleadores deben compartir información entre ellos para estar al tanto de las sustancias químicas utilizadas. Un dato importante que hay que recordar es que la norma Hazcom da a los trabajadores el derecho de tener información sobre las sustancias químicas que se encuentran en su área de trabajo, no solo en el trabajo que están haciendo.

El programa escrito Hazcom debe estar disponible en la obra y debe incluir la siguiente información:

- Una lista de todas las sustancias químicas peligrosas existentes en el lugar
- Los métodos que el empleador utilizará para informar a los trabajadores sobre las etiquetas y las SDS
- Los métodos que el empleador utilizará para informar a los empleados sobre los riesgos de las tareas no rutinarias
- Los métodos que el empleador utilizará para dar a otros empleadores acceso a las SDS dentro de la obra, cuando se trate de obras con múltiples empleadores

En obras con múltiples empleadores, como sucede en la mayoría de las obras de construcción, los programas de comunicación de riesgos deben:

- Explicar cómo se facilitarán las SDS a otros empleadores
- Ofrecer una lista de los métodos que unos empleadores utilizarán para informar a otros empleadores sobre las medidas tomadas para proteger a los trabajadores durante condiciones de operación normales y emergencias previsibles
- Explicar cómo unos empleadores informarán a otros empleadores sobre los sistemas de etiquetado que serán utilizados

Hazcom otorga derechos a los trabajadores.

Según lo conferido por la norma Hazcom de OSHA, usted tiene derecho de:

- Analizar el programa escrito
- Recibir información referente a sustancias peligrosas
- Hacer que su médico o representante sindical reciba información en su nombre
- Ejercer sus derechos sin temor a sufrir represalias ni despido

Las etiquetas, el segundo requisito indispensable de la norma Hazcom de OSHA, se pueden encontrar en la sección 1910.1200(f)

OSHA exige ahora que todas las etiquetas tengan todos los cuatro elementos mencionados a continuación, además de la identificación del producto y la identificación del proveedor:

Figura 5

1. **Palabra de advertencia** (*signal word*) significa una palabra utilizada para indicar el nivel relativo de la gravedad del riesgo y alerta al lector de la etiqueta sobre un riesgo potencial. Las palabras de advertencia utilizadas en inglés son “danger” y “warning” (en español: peligro y advertencia). La palabra “danger” se utiliza para los riesgos más serios, mientras que “warning” se usa para los menos serios.
2. **Declaración del riesgo** (*hazard statement*) quiere decir una declaración asignada a una clase y una categoría de riesgo que describe la naturaleza del peligro de una sustancia química, y puede ser, en algunos casos, el grado de riesgo.
3. **Pictogramas de riesgo** (*hazard pictograms*) quiere decir un diseño que puede ser un símbolo u otros elementos gráficos, como un borde, un diseño de fondo o un color, que tiene el propósito de comunicar información específica sobre los riesgos de una sustancia química. Esta norma tiene asignados ocho pictogramas para aplicarse a una categoría de riesgo.
4. **Consejos de prudencia** (*precautionary statement*) quiere decir una frase que describe las medidas recomendadas que deben tomarse para reducir al mínimo o prevenir los efectos adversos que pueden resultar de la exposición a una sustancia química peligrosa o por causa de almacenamiento o manejo inadecuados.

Las etiquetas deben tener información adicional.

1. Identificación del producto es el nombre o el número utilizado para una sustancia química peligrosa en una etiqueta o en la SDS
2. Identificación del proveedor es el nombre, la dirección y el número de teléfono del fabricante o importador de la sustancia química u otra parte interesada
3. Información complementaria es cualquier información adicional

Una o dos palabras de advertencia son exigidas en las etiquetas para recalcar el riesgo. ¿Cuál comunica la mayor gravedad?

☐ Danger (en español, peligro) ☐ Warning (en español, advertencia)

Las etiquetas también deben contar con consejos de prudencia para describir cómo evitar un daño. Ejemplo de este tipo de consejo:

- “Only use non-sparking tools” (Usar solo herramientas que no generen chispas)
- “Store in a cool, well ventilated and locked place” (Guardar en un lugar fresco, bien ventilado y cerrado bajo llave)
- “Do not breathe vapors” (No inhalar los vapores)
- “Wear protective gloves” (Usar guantes protectores)

Veamos la Figura 6. Etiqueta de ejemplo proporcionada por OSHA

Figura 6

Existen 9 símbolos llamados pictogramas que vamos a estudiar.

Figura 7

La fila superior son riesgos físicos y la fila inferior son riesgos para la salud, excepto por el pictograma ambiental final.

Cualquier cosa que eche en un recipiente, deberá ser etiquetada a menos que la vaya a usar de inmediato y la mantenga bajo control.

Figura 8

Nombre del pictograma	Pictograma	Sustancias químicas incluidas
Llama		Inflamables Reaccionan espontáneamente (autoreactivas) Pirofóricos Se calientan espontáneamente Emiten gas inflamable Peróxidos orgánicos
Oxidante		Oxidantes
Signo de exclamación		Irritantes Sensibilizadores cutáneos Toxicidad aguda (dañina) Efectos narcóticos Irritante de las vías respiratorias
Bomba explotando		Explosivos Reaccionan espontáneamente (autoreactivos) Peróxidos orgánicos
Corrosión		Corrosivos
Botella de gas		Gases bajo presión
Peligro para la salud		Carcinógeno Sensibilizadores respiratorios Toxicidad para la reproducción Toxicidad en órganos específicos Mutagenicidad Toxicidad por aspiración
Calavera y tibias cruzadas		Toxicidad aguda (grave)
Contaminante para el medio ambiente		Forma parte de GHS, pero no de la norma 1910.1200. OSHA no tiene jurisdicción sobre asuntos medioambientales

Ejercicio en grupo: unir los pictogramas con sus significados

Sin ver la página anterior, escriba la letra correcta del pictograma que corresponde a cada categoría química.

_____ Inflamables

_____ Efectos narcóticos

_____ Oxidantes

_____ Reaccionan espontáneamente

_____ Se calientan espontáneamente

_____ Irritantes

_____ Peróxidos orgánicos

_____ Explosivos

_____ Gases bajo presión

_____ Carcinógenos

_____ Sensibilizadores cutáneos

_____ Toxicidad aguda (dañina)

_____ Irritación de las vías respiratorias

_____ Reaccionan espontáneamente

_____ Corrosivos

_____ Sensibilizadores respiratorios

_____ Toxicidad para la reproducción

_____ Toxicidad en órganos específicos

_____ Mutágenos

Las hojas de datos de seguridad (SDS), el tercer requisito indispensable de la norma Hazcom de OSHA 1910.1200 (g)

Las hojas de datos de seguridad deben seguir un formato de 16 secciones, en cumplimiento de la norma ANSI Z400.1.

Figura 9

1. La identificación incluye: la identificación del producto, el nombre del fabricante o distribuidor junto con el número de teléfono y el número para casos de emergencia. También incluye una lista del uso recomendado para el producto y por último, las restricciones.
2. La identificación de los riesgos incluye todos los peligros que puede originar la sustancia química.
3. La composición y la información sobre los ingredientes describen las distintas sustancias químicas que componen el producto y cualquier declaración de secreto comercial.
4. Las medidas de primeros auxilios describen los síntomas importantes, los efectos sobre la salud ya sea inmediatos o no inmediatos y el tratamiento requerido.
5. Las medidas para combatir incendios describen la manera adecuada de extinguir un incendio, el equipo y los peligros químicos derivados del fuego.
6. Las medidas para enfrentar emanaciones accidentales explican los procedimientos para casos de emergencia, el equipo de protección y los métodos adecuados de contención y limpieza.
7. La manipulación y el almacenamiento describen las precauciones de manejo y almacenamiento seguros, incluso ante la presencia de otras sustancias químicas no compatibles con el producto.
8. Los controles de exposición y la protección personal describen los Límites de exposición permisible (Permissible Exposure Limits, PEL) de OSHA, los Valores umbrales límite (Threshold Limit Values, TLV) junto con los controles de ingeniería adecuados y el equipo de protección personal.
9. Las propiedades físicas y químicas indican las características del producto como densidad de vapor, punto de inflamabilidad o límites explosivos.
10. La estabilidad y reactividad se refieren a la estabilidad de la sustancia química y la posibilidad de reacciones peligrosas.
11. La información toxicológica describe las maneras en que la sustancia química puede introducirse en el cuerpo y los distintos efectos que esto puede tener sobre la salud.
12. La información ecológica se refiere al daño que la sustancia química puede producir en el medio ambiente, pero OSHA no se ocupa de este aspecto.
13. Las consideraciones de eliminación razonan los posibles daños que pueden ocurrir

cuando se desecha una sustancia química. Este es un aspecto que está fuera del alcance de OSHA.

14. La información de transporte tiene que ver con los riesgos potenciales que pueden surgir al transportar la sustancia química (OSHA no se ocupa de este aspecto).
15. OSHA no hace cumplir la información normativa.
16. Otra información trata sobre la fecha en que la SDS fue preparada o la última revisión efectuada.

Siempre que el empleador reciba una SDS nueva o modificada que podría tener un efecto sobre la salud, deberá notificarle en los 30 días posteriores.

OSHA exige que, “Tal información debe darse a los empleados oportunamente (en un máximo de 30 días después de recibirla) si la nueva información indica que existen riesgos considerablemente mayores o medidas necesarias para proteger la salud del empleado, en comparación con los riesgos citados en la hoja de datos de seguridad de materiales divulgada anteriormente”.

Actividad: Análisis de una SDS

Duración de la actividad: 15 minutos (10 para el trabajo en grupo y 5 para informar los resultados)

Objetivo: El objetivo de esta actividad es practicar el análisis de una SDS. Una SDS es una de las herramientas principales de la comunicación de riesgos. Esta actividad le permitirá analizar una SDS de una sustancia química que se encuentra comúnmente en las obras de construcción. En el Apéndice B se pueden encontrar cinco SDS.

Tarea: Tómese unos minutos para analizar y conocer la SDS que le han asignado. Junto con su grupo, trabaje para responder las siguientes preguntas sobre la SDS provista. Elija a un representante del grupo para que, en nombre de todos, dé las respuestas al resto de la clase.

Trade	Task	Product	Chemical of Concern	Available Exposure Data
Carpintero	Recubrir madera	MINWAX Fast Drying Polyurethane	Hidrocarburo Alifático Ligero	61 ppm (muestra de 15 minutos)
	Encolado	Loctite PL300 Foamboard Construction Adhesive	Caliza	<0.025 mg/m^3
Pintor	Dar una mano de pintura	Sherwin Williams PRO INDUSTRIAL™ Multi-Surface Acrylic Eg-Shel	2-Butoxyethanol	0.04 to 367 ppm
Albañil (sheet metal)	Instalar ductos	3M Fastbond 900 Sealer	Etilbencina	5.0 ppm
Albañil	Reparar juntas o sellar grietas	Sikaflex Crack Flex Sealant	Isocianato	<0.001 to <0.002 ppm
Techador	Aplicar alquitrán de hulla	Tremfix Coal Tar Roofing Pitch	Sustancias volátiles del alquitrán de hulla	0.14 to 1.93 mg/m^3

1. ¿Qué efectos podría tener este producto en la salud?

2. ¿Hay probabilidad de que las exposiciones sobrepasen el Nivel de exposición ocupacional (OEL)? ¿O el Límite de exposición permisible (PEL)?

3. La hoja SDS, ¿explica adecuadamente cómo controlar los riesgos?

4. ¿Hay alguna otra sustancia química que le preocupe?

Información y Capacitación de Empleados

Figura 10

Cuarto requisito indispensable de la Norma Hazcom de OSHA, 1910.1200 (h)

Los empleadores deberán facilitar a los empleados información y capacitación efectivas sobre las sustancias peligrosas que pueden encontrarse en su área de trabajo al asignarle su primer trabajo y siempre que se introduzca un nuevo riesgo en su área de trabajo. En otras palabras, según la ley, el empleador no puede dejar trabajar a los trabajadores con una sustancia química que desconozcan por completo.

Los trabajadores deben recibir capacitación en:

- La norma de comunicación de riesgos y sus requisitos
- Cualquier operación en su área de trabajo donde se encuentren sustancias peligrosas
- Peligros físicos y de salud de las sustancias en el área de trabajo

Los trabajadores también deben recibir capacitación en:

- Los métodos y las observaciones que podrían ser usados para detectar la presencia o la emanación de una sustancia peligrosa en el área de trabajo
- Las medidas que pueden tomar para protegerse de los riesgos
- Los detalles, la ubicación y la disponibilidad del programa Hazcom escrito de su empleador
- Ubicación y disponibilidad de las SDS
- Derechos especiales de los trabajadores otorgados por la norma Hazcom
- Sistemas de etiquetado

Figura 11. Manual de SDS en una ubicación difícil de encontrar

Los trabajadores también deben recibir capacitación en las categorías generales de riesgos (corrosivos, carcinógenos, etc.) que representan las sustancias químicas usadas en el lugar de trabajo. Usted no está obligado a recibir capacitación en cada una de las sustancias químicas con las que trabaja, pero sí debe recibir capacitación relativa a las categorías generales de riesgos, ya que tienen el mismo efecto.

¿Existe un requisito de capacitación anual en Hazcom?

☐ Sí ☐ No

Sección 3: Análisis de los Efectos Comunes Sobre la Salud

Existe una gama de efectos sobre la salud que son causados por las sustancias químicas.

Asfixiantes químicos simples

Si una sustancia química desplaza tal cantidad de aire que no deja suficiente oxígeno para respirar, puede ocasionar una **asfixia simple**.

Existen muchos asfixiantes simples.

¿Cuál de estos se pueden encontrar en una obra de construcción?

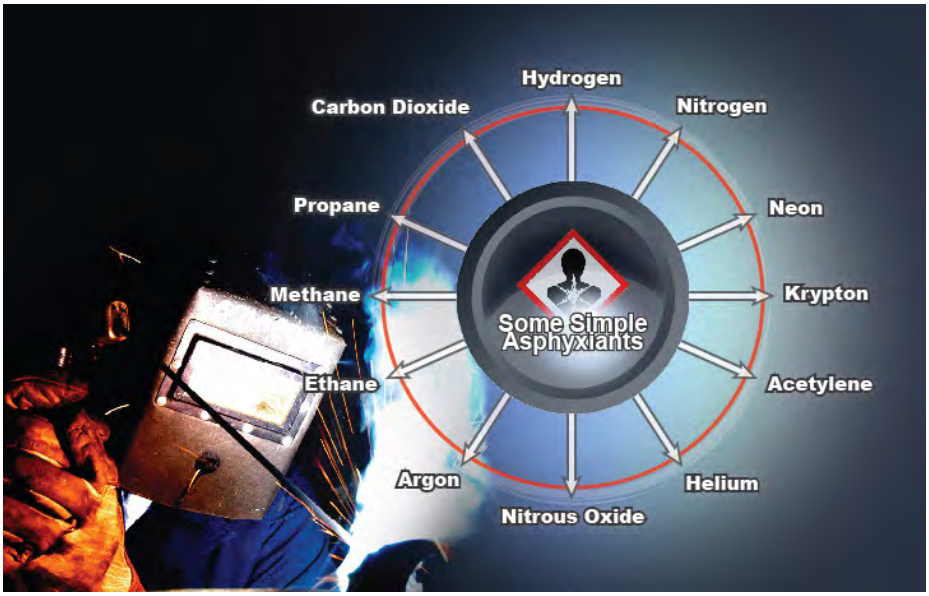

Figura 12

Figura 13. Espacio confinado.

Dos trabajadores murieron justamente en este espacio confinado en 2006. El estudio del caso realizado por la Chemical Safety Board tiene un video del incidente que se vale de un simulacro computarizado para dar explicación de las muertes. Se trata de muerte por asfixia ocurrida en la refinería Valero de Delaware City en la que dos empleados contratistas estaban preparándose para volver a colocar una tubería en un depósito de presión mientras se purgaba con nitrógeno. El primer trabajador, con la intención de recuperar un rollo de cinta adhesiva del interior del depósito, cayó desplomado por el nitrógeno. Su compañero de trabajo, el capataz, terminó asfixiado en un intento por rescatarlo.

Vínculo al estudio del caso: http: //www.csb.gov/assets/document/Valero_Case_Study.pdf

Vínculo al video: http: //www.csb.gov/investigations/detail.aspx?SID=25&Type=2&pg=1&F_All=y

Los asfixiantes químicos reducen la capacidad de la sangre para transportar oxígeno, lo que puede producir asfixia.

Algunos ejemplos

- Ácido sulfhídrico (Hydrogen sulfide)
- Monóxido de carbon (Carbon monoxide)
- Cianuro de hidrógeno (Hydrogen cyanide)

Los sensibilizadores y alérgenos desencadenan una reacción en el cuerpo tal que hasta la más mínima exposición puede ocasionar una reacción.

Los sensibilizadores y alérgenos producen una reacción en una persona. La reacción depende de la persona afectada. Una vez que la persona ha sido sensibilizada o se vuelve alérgica a una sustancia química, las exposiciones más bajas pueden causar una reacción y la reacción puede agravarse.

Nombrar algunos ejemplos de sensibilizadores o alérgenos

En el espacio a continuación, nombre varias sustancias que pueden ocasionar una reacción alérgica.

Respuestas de la pregunta anterior:

- El aislamiento en aerosol que contiene isocianatos
- Pinturas con base de aceite
- Polvo de madera
- Roble venenoso (poison oak) y hiedra venenosa (plantas de la familia Rhus)

Los corrosivos pueden causar graves daños en el cuerpo.

Los corrosivos se usan ampliamente en la fabricación de productos químicos y en la construcción. Conviene entender bien los productos con los que está trabajando (como grabar concreto con ácido fluorhídrico) antes de comenzar a trabajar.

- Los ácidos y las bases son productos químicos corrosivos
- Los corrosivos pueden dañar la piel, los ojos y el aparato respiratorio
- La magnitud del daño en la piel depende de la cantidad de tiempo que permanezca el corrosivo en la piel y de su concentración.

Figura 14

Los mutágenos pueden provocar cambios genéticos y producir defectos de nacimiento u otros problemas en generaciones futuras.

Nombrar algunos ejemplos de mutágenos

- Radiación ionizante
- Ácida sódica
- Bromo

¿Qué son los teratógenos?

Figura 15

Los teratógenos son compuestos que pueden dañar el feto en desarrollo, causando defectos de nacimiento o la muerte. El peor caso de exposición a teratógeno ha sido el de una población en la Bahía de Minamata en Japón, descubierto en 1956. En este caso, se utilizó mercurio de metilo como catalista en un proceso químico en la fábrica química de Chisso Corps, que vertió el producto continuamente de 1932 a 1968 en la Bahía de Minamata.

El plomo también ha demostrado ser un teratógeno potente, causante de discapacidades de aprendizaje y otros problemas en niños que habitan en casas que tienen pintura con base de plomo. El Dr. Herbert Needleman realizó un estudio innovador usando dientes de leche de niños pequeños para identificar un grado alto de plomo y los siguió por años. El estudio encontró una tasa alta de abandono escolar, problemas de comportamiento y roces con la ley.

Este es un vínculo en Wikipedia sobre su trabajo:

http://en.wikipedia.org/wiki/Herbert_Needleman

Las sustancias químicas que producen cáncer deben aparecer en la SDS incluso si la cantidad es de solo 0.1 por ciento del producto.

Los carcinógenos son compuestos que producen cáncer. Algunas sustancias químicas son conocidas por ser carcinógenos comprobados o supuestos. De otras sustancias, solo se sospecha que son carcinógenas. Los fabricantes están obligados a nombrar todo carcinógeno en sus productos, incluso si la cantidad es apenas del 0.1% del producto. NIOSH dice que no se conoce un nivel seguro de exposición a los carcinógenos de modo que los empleadores y trabajadores deben tratar de que la exposición sea CERO.

Los siguientes son algunos carcinógenos conocidos y supuestos:

- Asbesto (asbestos)
- Benceno (benzene)
- Berilio (beryllium)
- Cadmio (cadmium)
- Emanaciones de asfalto (supuestas)
- Sílice (silica)

Los efectos de las sustancias químicas sobre el cuerpo dependen de muchos factores.

Existen muchos factores que pueden incidir en cómo una sustancia química o una combinación de productos químicos puede perjudicar a los trabajadores. Por lo tanto, lo mejor es reducir las exposiciones químicas en la medida de lo posible. La que sigue es una lista pequeña de los factores que inciden en el efecto de una sustancia química sobre el cuerpo:

- La forma física de la sustancia química
- Cómo las sustancias químicas penetran en el cuerpo (vía de penetración)
- La dosis
- La toxicidad química
- La reacción personal a la sustancia química (edad, sexo, raza, peso, etc.)

El verdadero veneno es la dosis.

"Todas las sustancias son venenosas; no hay una que no lo sea. La dosis correcta es lo que diferencia el remedio del veneno". Paracelso (1493-1541)

Un químico suizo del siglo dieciséis llamado Paracelso nos legó la regla más básica de la toxicología: "El verdadero veneno es la dosis". Prácticamente todas y cada una de las sustancias sobre la Tierra (incluso el agua y la vitamina C) pueden causar la muerte si su concentración en el estómago o la corriente sanguínea llega al grado nocivo.

Figura 16. Retrato de Paracelso

La curva de respuesta a una dosis ilustra cómo la gente responde a las sustancias químicas tóxicas

Durante los estudios de efectos químicos, se prepara una curva de respuesta a una dosis para un efecto específico dentro de una población. La mayoría de las curvas de respuesta a las dosis adoptan una forma de "S" característica, tal como se muestra en la imagen.

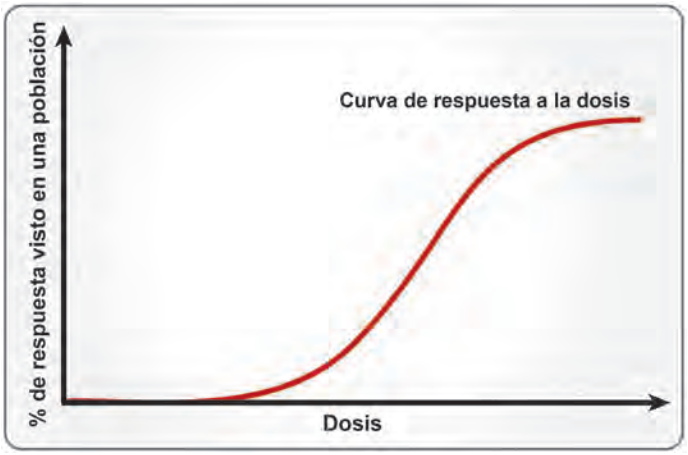

Figura 17. Curva de respuesta a la dosis.

Por ejemplo, veamos una sustancia muy común, la cafeína. Si una persona consume 10 gramos de una sola vez, sería fatal. Sin embargo, la cafeína es una sustancia común y corriente que se encuentra en los alimentos y bebidas que se consumen a diario.

¿Qué podría afectar el detrimento de una persona por causa del alcohol junto con el número de bebidas alcohólicas consumidas? ¿Hay también diferencias individuales para los efectos ocasionados por sustancias químicas en el trabajo?

¿Cómo penetran las sustancias químicas en el cuerpo?

Las sustancias químicas constituyen un riesgo solamente cuando hay exposición. Existen cuatro vías principales por las que las sustancias químicas pueden penetrar en el cuerpo. El tipo más común de exposición es a través de la respiración (inhalación). La persona inhala la sustancia química que luego se introduce a los pulmones, desde donde pasa a la corriente sanguínea. Realizamos aproximadamente de 20 a 25 mil inhalaciones en un día, lo cual significa un volumen total promedio de 10,000 a 14,000 litros (de 13 a 18 yardas cúbicas) de aire en un día.

El segundo tipo más común de exposición química en el lugar de trabajo es la absorción a través de la piel. En el caso de determinadas sustancias químicas, una vez que se absorbe a través de la piel, pasa a la corriente sanguínea.

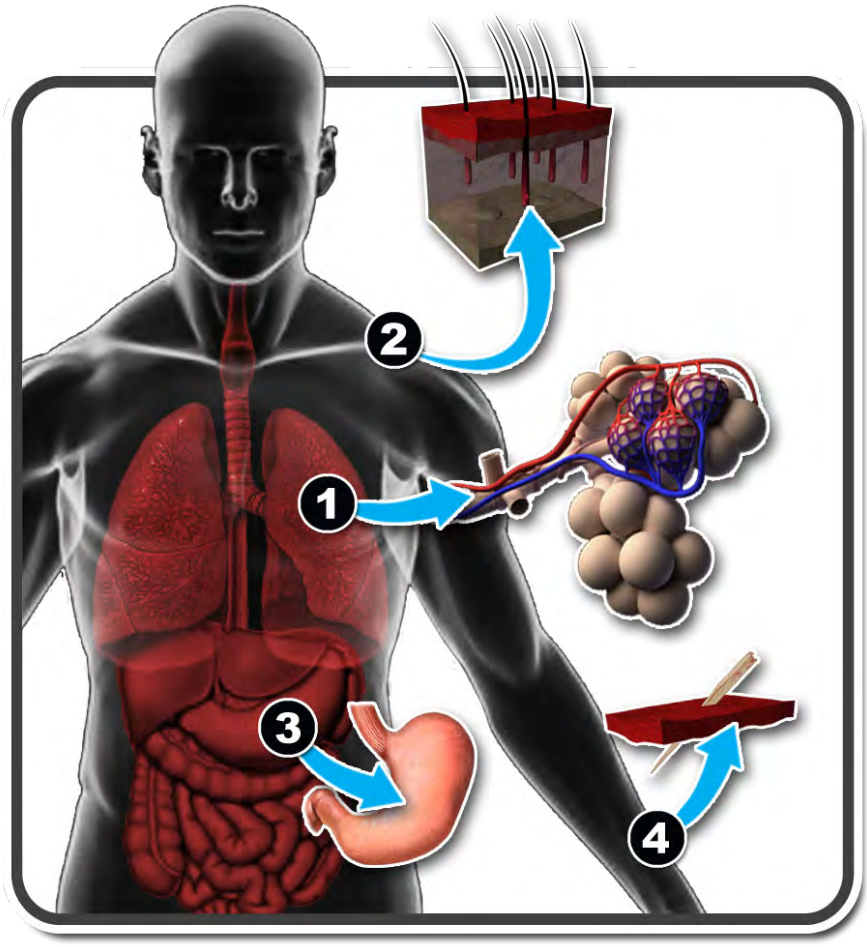

Figura 18. Hay cuatro rutas principales en las que los químicos pueden entrar a tu cuerpo.

El tercer tipo más común de exposición química es a través de la ingestión, por la cual la sustancia química se introduce en el cuerpo a través de la boca y es absorbida a través del aparato digestivo. Para reducir al mínimo la vía de ingestión, deben observarse prácticas de higiene como lavarse las manos y la cara antes de comer y beber.

El cuarto tipo más común de exposición química es a través de la inyección, es decir, la sustancia química se introduce al cuerpo mediante un objeto punzante, como una aguja, un clavo o una rebarba.

1. La inhalación es la vía de penetración principal

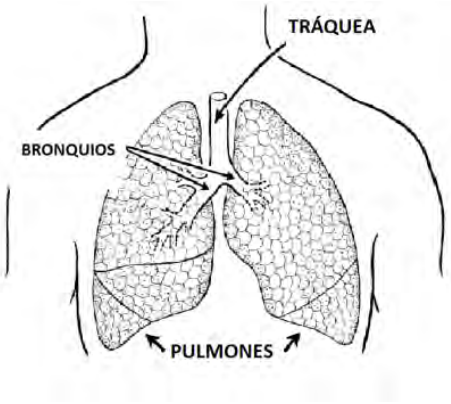

Figura 19

Los pulmones son una vía crítica de penetración para la exposición a sustancias químicas peligrosas en el lugar de trabajo. Si uno pudiera tomar un par de pulmones promedio y esparcirlos, cubrirían un área del tamaño de una cancha de tenis (140 m2). Esto quiere decir que el área dentro de los pulmones donde las sustancias químicas pueden interactuar con el tejido es enorme.

Los pulmones también son una consideración importante por el gran volumen de aire (y contaminantes en el aire) que pasa a través de ellos continuamente, así como las membranas delgadas en la región de intercambio de gas (alvéolos).

- Los gases y vapores pueden llegar a lo más profundo de los pulmones
- El tamaño de las partículas y gotas repercute en el lugar donde se asienta la sustancia química en el aparato respiratorio
- Y el punto donde se asienta la sustancia química dentro del aparato respiratorio influye en los síntomas y las enfermedades

2. La absorción es la siguiente vía más común

La piel tiene un revestimiento protector de aceites que actúa como una barrera natural. La grasa soluble puede traspasar la piel y ser absorbida por la corriente sanguínea. Cantidades significativas de sustancias químicas tienen más probabilidades de ser absorbidas cuando un área grande de piel está en contacto directo con un líquido, rocío o polvo por un largo periodo de tiempo. Para algunas sustancias altamente tóxicas, algunos niveles peligrosos pueden ser absorbidos cuando la piel entra en contacto con gases o vapores. El cianuro de hidrógeno es un ejemplo de un gas que puede ser absorbido. Una vez dentro de la corriente sanguínea, las sustancias químicas circulan por el cuerpo y pueden dañar otros órganos. Sin embargo, otras sustancias químicas, tales como los corrosivos, pueden afectar la piel por contacto directo. Una piel lesionada o muy mojada puede permitir el paso de sustancias hacia la corriente sanguínea. Una sustancia química concentrada traspasará con mayor facilidad la barrera de la piel.

Las sustancias químicas también pueden ser absorbidas a través de las membranas mocosas en los ojos o la nariz.

- Si las sustancias químicas entran en contacto con la capa exterior de su cuerpo, existe la posibilidad de que lo penetren
- Algunas áreas tienen más riesgos que otras, como el área de los ojos, del aparato reproductivo y la frente.
- Las heridas abiertas pueden aumentar la absorción
- Las propiedades químicas afectan la absorción

¿Tienen todas las áreas de la piel la misma protección?

☐ Sí ☐ No

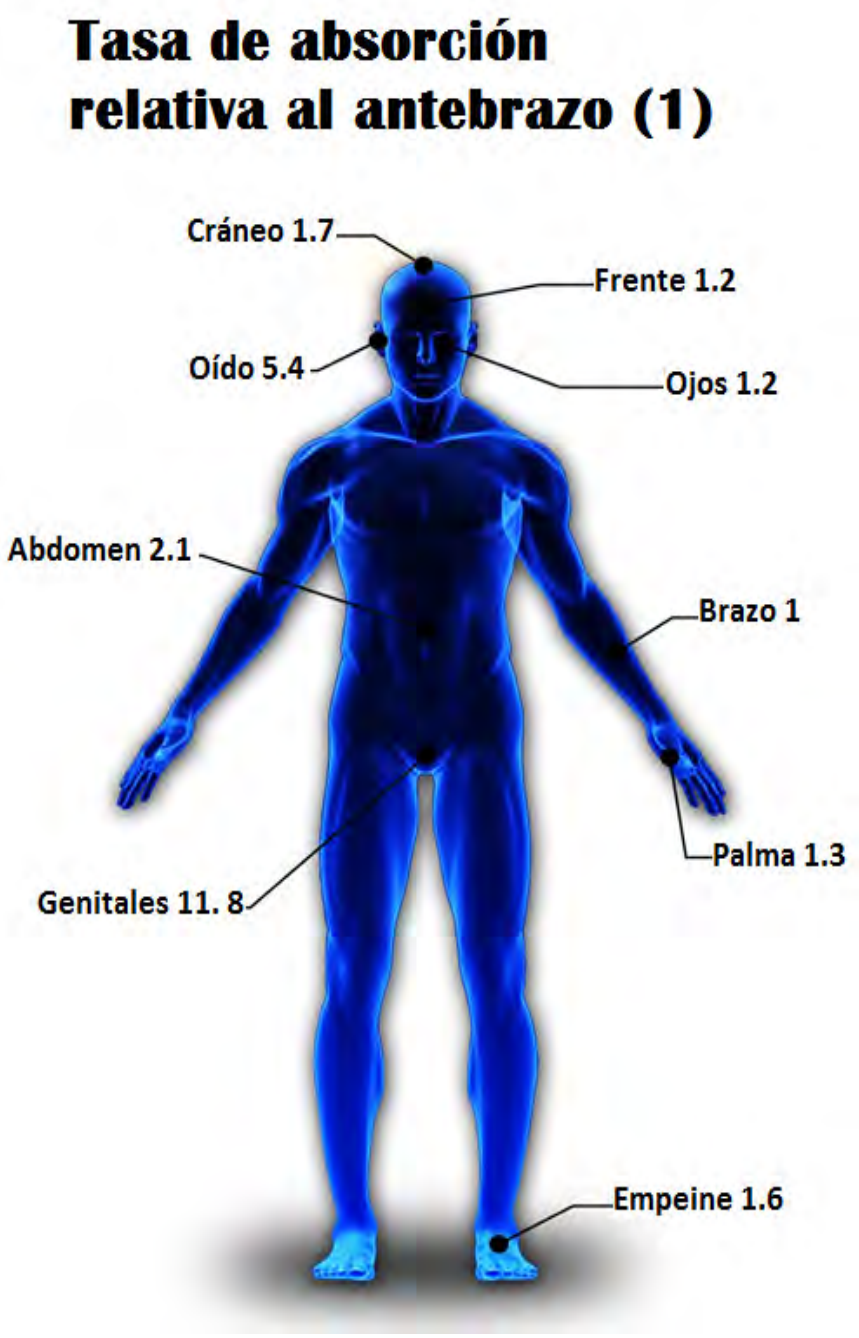
Tasa de absorción relativa al antebrazo (1)
Cráneo 1.7
Frente 1.2
Oído 5.4
Ojos 1.2
Abdomen 2.1
Brazo 1
Palma 1.3
Genitales 11. 8
Empeine 1.6

Figura 20

3. Ingestión

Las sustancias químicas que se tragan son absorbidas por el aparato digestivo

Figura 21. Los trabajadores toman un almuerzo en “Ground Zero”.

Muchas sustancias pueden ingresar al cuerpo a través de la boca y el aparato digestivo. Esta es una vía de penetración menos común que el aparato respiratorio o la piel. Las manos de una persona podrían estar cubiertas de un polvo tóxico (digamos, plomo) o la persona podría después comer, fumar o aplicarse algún producto cosmético y sin querer “comerse” el polvo.

4. Inyección

Los trabajadores de la construcción tienen altas probabilidades de sufrir una inyección accidental de sustancias químicas

Figura 22. Clavo que sobresale de la madera.

Nombre varias formas en que los trabajadores podrían absorber, inhalar, ingerir o inyectarse sustancias químicas. Escriba sus respuestas a continuación.

Las exposiciones químicas son agudas o crónicas. ¿Cuál es la diferencia?

La exposición aguda es una dosis alta en poco tiempo o en un instante. Las exposiciones agudas pueden provocar una enfermedad o una lesión que se manifiesta de inmediato o a los pocos días. En general, los efectos desaparecen después de que la exposición finaliza. Sin embargo, algunas veces, la exposición puede provocar una enfermedad permanente como el asma o la muerte de células como en el caso de la radiación ionizante. Un ejemplo de un efecto agudo es el polvo del cemento Portland que produce irritación de la garganta.

- Exposición alta durante un tiempo corto (desde un instante hasta unos días)
- Una vez que cesa la exposición, el daño puede ser reversible… o no

Exposición crónica es una dosis repetida, desde baja hasta media de una sustancia química que puede producir una enfermedad de evolución lenta, durante meses o años o se manifiesta años después de la exposición. La asbestosis y el cáncer son ejemplos de enfermedades crónicas.

- Exposición baja durante un tiempo prolongado (años)
- Puede provocar una enfermedad u otros efectos irreversibles

¿Qué padecimientos crónicos pueden ser provocados por el acabado de cemento?

¿Qué es un periodo de latencia? Nombre un ejemplo clásico

Escriba la respuesta aquí:

¿Cuál es la diferencia entre daño local y daño sistémico?

Algunas sustancias químicas ocasionan daño en el lugar mismo donde ocurre la exposición, como en el caso de una quemadura de ácido. Otras sustancias químicas pueden tener un efecto sistémico sobre el cuerpo, como ocurre con el plomo o el alcohol. Y otras pueden tener ambos efectos, como el alcohol y los disolventes orgánicos que se usan en el trabajo.

Muchas sustancias químicas pueden tener efectos únicos cuando se combinan en el cuerpo.

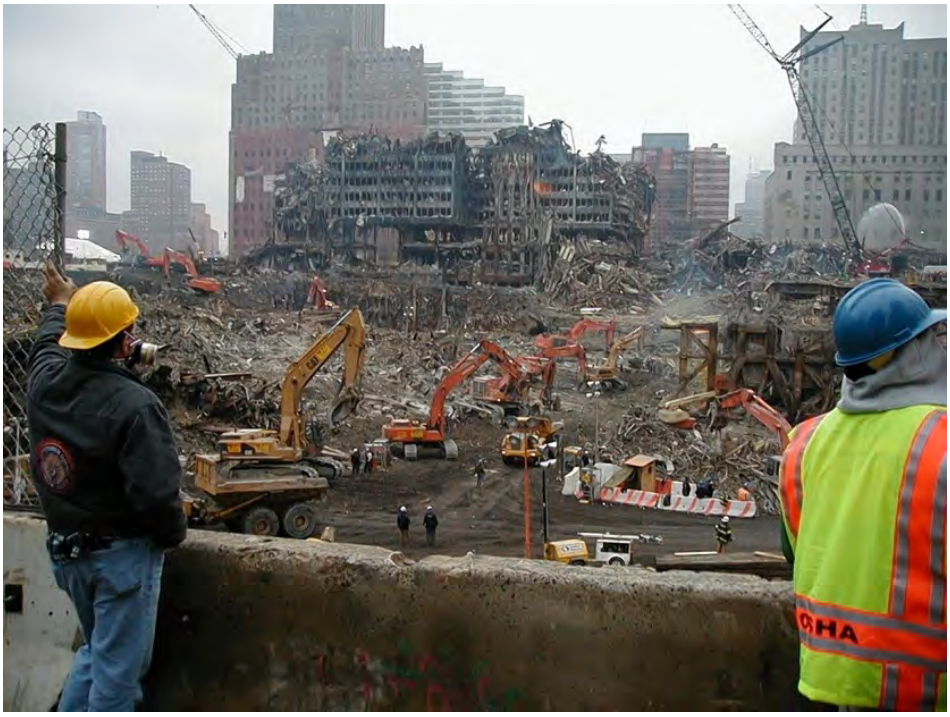

Figura 23. World Trade Center limpiar.

Ejemplos:

- Alcohol y disolventes
- Asbesto y humo de cigarrillos
- Exposición en la limpieza del World Trade Center

Sección 4: Generalidades de los Riesgos Químicos

Como se mencionó en la sección anterior, la capacitación de trabajadores en diferentes categorías de riesgos es obligatoria.

Todas las sustancias químicas se encuentran en uno de tres estados.

Las sustancias químicas, o materiales peligrosos, vienen en todos los estados, formas y tamaños. Cuando se reconocen los estados en los que se pueden encontrar las sustancias químicas, el trabajador se puede dar una idea de cómo pueden ser un riesgo para él mismo y para sus compañeros de trabajo. Los estados son tres: sólido, líquido y gaseoso. Incluso la misma sustancia química puede tener estados diferentes, dependiendo de las condiciones ambientales tales como la presión y la temperatura. Por ejemplo, en condiciones normales, el agua es un líquido entre 32o F y 212o F. A menos de 32o F es un sólido (hielo) y a más de 212o F es un gas (vapor). Gran parte de esta información se puede encontrar en la SDS o en la etiqueta de un producto, pero no siempre.

Cada estado químico puede tener diferentes “tipos” o categorías. Escriba un ejemplo de una categoría después de cada estado.

1. Sólido Ej: _____
2. Líquido Ej: _____
3. Gaseoso Ej: _____

Además de determinar si una sustancia química está en estado sólido, líquido o gaseoso, también podemos ver las formas más comunes en que se presentan los productos químicos como muestra la siguiente lista:

Sólidos	Líquidos	Gases
• Polvos • Fibras • Humos	• Aerosoles • Niebla • Geles • Adhesivos	• Acetileno • Oxígeno • Monóxido de carbono • Nitrógeno

Sólidos

Figura 24. Polvo de lijado

Existen muchos sólidos a los que podría estar expuesto si trabaja en la construcción. Tómese un momento para pensar en todos los materiales de construcción que utiliza en el trabajo donde el “polvo” puede circular en el aire, llegar a su zona de respiración y de esa manera penetrar en su cuerpo.

El trabajo de mezclar cemento, concreto, mortero (mezcla) o lechada de cemento, además de cortar, limar o triturar cualquier material (incluso barrer el piso) podría generar una gran cantidad de polvo.

Si entiende que los materiales sólidos con los que trabaja pueden llegar a su zona de respiración, el conocimiento del riesgo puede motivarlo a tomar medidas para protegerse.

Líquidos

Los líquidos pueden entrar en contacto directo con la piel o los ojos y dañar el área de contacto o ser absorbidos por el cuerpo. Los líquidos pueden ser rociados y formar nieblas o evaporarse y generar vapores que se pueden inhalar. Las nieblas se pueden asentar en la piel y ser absorbidas o se pueden asentar en alimentos o bebidas contaminándolos. Cada vez que usa un líquido o un gel, la piel y los ojos están en riesgo de exponerse. Las pinturas, los adhesivos y los combustibles pueden formar vapores y llegar a su zona de respiración.

Gases y vapores

Figura 25. Vapores y polvo del asfalto.

Los gases son sustancias químicas que se encuentran en la fase gaseosa a temperatura ambiente (70o F). Los vapores se evaporan a partir de sustancias que son líquidas o sólidas a temperatura ambiente. **Los gases y vapores que un trabajador respira pueden alcanzar los pulmones y causar daño.**

Es importante entender estas propiedades físicas de las sustancias químicas.

Al entender algunas propiedades físicas de las sustancias químicas entenderá mejor cómo una sustancia actúa sobre el medio ambiente y por lo tanto tendrá mejor oportunidad de protegerse. Veamos la densidad de vapor, por ejemplo. Puede ser que le toque limpiar un componente mecánico en un espacio confinado con un disolvente orgánico que posee una densidad de vapor alta. Puede dar por hecho que comenzará a asentarse hacia el piso a medida que se va evaporando. ¿Cómo puede este conocimiento ayudarle a protegerse? Puede suponer que sin una buena ventilación, los vapores orgánicos quedan atrapados en el espacio y se acumulan a niveles que pueden ser nocivos.

Las propiedades físicas importantes que deben considerarse son:

- **pH (poder corrosivo)**
  La escala de pH es una manera sencilla de definir ácidos y bases. La escala asigna un número del 0 al 14 a una solución. Cualquier solución con un pH menor que 7 es un ácido. Cualquier sustancia con un pH mayor que 7 es una base. Una solución con un pH de 7 es neutra. **Con los corrosivos, la concentración es crítica:**

  Ácido acético:

  90% de la solución destruye la piel (pH<2),

  6% es el vinagre que usamos para las ensaladas (pH~4.5)

- **Presión de vapor (VP) (volatilidad de la sustancia química)**
  La presión de vapor es una medida que determina cuánto vapor desprende una sustancia química a una temperatura dada. Entre más alta la presión de vapor, más probabilidades de que la cantidad de sustancia química en el aire (encima del líquido) sea significativa. La presión de vapor se mide viendo con qué “fuerza” el vapor de un material “empuja” contra los lados de un recipiente cerrado. Entre más calor se aplique a un líquido, mayor será la presión de vapor producida. La medida se expresa en milímetros de mercurio (mmHg). La presión de vapor se determina generalmente para la sustancia química a temperatura ambiente. Entre más alta la temperatura, más alta será la presión de vapor. Si una sustancia dada tiene una presión de vapor alta, más llenará el aire de esa sustancia, comparada con una sustancia con una presión de vapor baja.

Presión de vapor baja — menos de 1 mmHg @ 68° F Moderate vapor Pressure — entre 1 y 10 mmHg @ 68° F High Vapor Pressure — por encima de 10 mmHg @ 68° F

¿Qué dice la presión de vapor del ácido sulfúrico sobre los riesgos de un derrame?

Presión de vapor del ácido sulfúrico = 0.001 mm Hg

- **Punto de inflamabilidad (Fl.P.)**
  Es la temperatura mínima de un líquido a la cual se desprende suficiente vapor para formar una mezcla inflamable con aire cerca de la superficie del líquido. En otras palabras, la temperatura a la cual se puede vaporizar suficiente combustible como para producir una explosión o incendio.

¿Cuál es la unidad para medir el punto de inflamabilidad?

Ejercicio en clase sobre el punto de inflamabilidad (opcional)

Con los recursos que tenga disponibles, busque y registre el punto de inflamabilidad para las sustancias químicas que aparecen a continuación y ordénelas desde la más inflamable hasta la menos inflamable.

Si tiene acceso a Internet, puede usar lo siguiente:

- The NIOSH Pocket Guide: http://www.cdc.gov/niosh/npg/

Sustancia química	Punto de inflamabilidad	Orden de inflamabilidad
Combustible diesel		
Gasolina		
Benceno		
Trementina		

- **Ingredientes de un incendio (tetraedro)**
  Inflamabilidad es la capacidad que tiene un sólido, líquido o gas de encenderse y producir una llama. Se necesitan cuatro elementos en proporciones específicas para que se dé la combustión: combustible, oxígeno, calor y reacción en cadena. La relación se ilustra a través del tetraedro del fuego, el cual se puede extinguir eliminando uno solo de los elementos indicados.

  

  Figura 26. **Tetraedro de fuego.**

  Antes, esto se llamaba el triángulo de fuego, pero se añadió la reacción en cadena porque la reacción debe continuar para que el incendio pueda alimentarse. Imagínese un momento que enciende un encendedor pequeño debajo de un madero de 2 por 4. Hay calor, oxígeno y combustible, pero no hay reacción en cadena. Si el madero del que hablamos estuviera enterrado en aserrín, la reacción progresaría porque las proporciones serían correctas.

- **Límites explosivos**
  La gama o el límite en el que los vapores se pueden mezclar lo suficiente en el aire como para comenzar a arder. Cada sustancia química (que puede quemarse) tiene un límite explosivo alto y uno bajo (UEL y LEL respectivamente). Si un combustible está dentro de la gama inflamable y hay suficiente oxígeno y una fuente de ignición, se producirá una explosión o fuego.

Ejercicio opcional: busque y tome nota del límite explosivo alto y bajo para estas sustancias químicas

Sustancia química	Límite explosivo bajo %	Límite explosivo alto %
Queroseno		
Gasolina		
Cloruro de metileno (quitapintura de muebles)		

- **Densidad de vapor (VD) y densidad de gas relativa (RgasD)**
  La densidad de vapor indica si el vapor de un líquido sube o baja en el aire. La densidad de vapor se mide en comparación con el aire (aire = 1). Si una sustancia química tiene una densidad de vapor mayor que uno, quiere decir que el vapor tendrá la propensión de descender al suelo, y desplazarse como si fuera un líquido, acumulándose en charcos y charquitos en lugares bajos. El material podría no ser tóxico, aunque podría acumularse en áreas bajas o espacios confinados a un nivel lo suficientemente alto como para causar una atmósfera explosiva o para reemplazar el oxígeno en el aire.

¿Cuál es la regla que se aplica a la densidad de vapor para la mayoría de las sustancias químicas que se pueden encontrar en una obra de construcción?

☐ Más pesada que el aire ☐ Más liviana que el aire

Estas no son todas las propiedades físicas de las sustancias químicas, sino las que más afectan la salud y seguridad de los trabajadores. Muchas de ellas se pueden identificar en una SDS de una sustancia química o en la guía de bolsillo titulada National Institute for Occupational Safety and Health (NIOSH) Pocket Guide.

Sección 5: Medición y Límites de Exposición

Ahora veremos la medición de las sustancias químicas, las unidades de medida y los límites de exposición.

¿Por qué monitorear?

Una de las exigencias de capacitación en Hazcom es estudiar cómo se monitorea el aire. Si usted está en una obra y está recibiendo capacitación en Hazcom, se le debe informar, mediante el curso de capacitación, que la obra tiene la capacidad de monitorear las exposiciones químicas que podrían ocurrir. Si tiene alguna pregunta sobre el monitoreo del aire, no dude en contactar a su supervisor, representante sindical o el profesional de salud y seguridad de la obra.

Existen dos tipos de monitoreo: el que se hace en tiempo real y las muestras que se envían a un laboratorio.

El equipo de prueba en tiempo real puede dar una medida de exposición química inmediata.

- Gases combustibles
- Vapores y gases tóxicos.
- Oxígeno

Figura 27

Pero OSHA exige que se tome una muestra de la zona de respiración de un trabajador.

El monitoreo personal determina la exposición específica del empleado.

El reconocimiento de estas unidades podrá ayudarle a comprender los resultados de la exposición.

Las unidades de medidas comunes incluyen:

- Partes por millón (ppm)
- Partes por mil millones (ppb)
- Miligramos por metro cúbico (mg/m3)
- Por ciento (%)
- Fibras por centímetro cúbico (fibras/cc)

Lo que se llama partes por millón (“ppm”) es una cantidad muy pequeña; un ejemplo es 4 gotas de tinta en un bidón de 55 galones. Lo que se llama partes por mil millones (en inglés, billion o “ppb”) es un mil veces menos que la ppm.

El gramo es una medida de peso.

- 1 clip = 1 gramo
- Miligramo (mg) = la milésima parte de un gramo (1,000a.)
- Microgramo (µg) = la millonésima parte de un gramo (1,000,000a,)


Figura 28

Centímetro cúbico es una medida de volumen.

Un dedal contiene alrededor de 3 centímetros cúbicos de aire.


Figura 29

OSHA ha establecido PEL o Límites de exposición permisible, pero lo que es sumamente importante recordar es que...

- La mayoría de los límites se derivan de los Valores umbrales límite (TLV) establecidos por la American Conference of Governmental Industrial Hygienist (ACGIH) celebrada en 1968
- Los Valores umbrales límite (TLV) que rigen hoy en día son generalmente más bajos
- Los Límites de exposición recomendados por NIOSH (REL) son generalmente más bajos
- La mayoría de las sustancias químicas no tienen asignados límites de exposición

¿Cuáles son los principales límites de exposición?

Los límites de exposición son una manera de comparar la exposición de un trabajador en el trabajo con un límite que se supone que es “seguro” porque fue obtenido de un estudio científico. Se puede decir que muchos límites de exposición son demasiado bajos y la mayoría de las sustancias químicas no tienen establecido un límite de exposición. Sin embargo, es todo lo que hay para ayudar a proteger a los trabajadores. Algunos límites de exposición sirven de pauta (por lo general son más protectores) y algunos otros son obligados por la ley (aunque no son tan protectores como las pautas). A continuación se muestran tres límites de exposición principales que se usan para proteger a los trabajadores.

- Los PEL: Límites de exposición permisible de OSHA. Los PEL son exigidos por la ley.
- Los TLV: Valores umbrales límite de la ACGIH
- Los REL: Límites de exposición recomendados por NIOSH

La mayoría de los límites de exposición se basan en un promedio de ocho horas de trabajo.

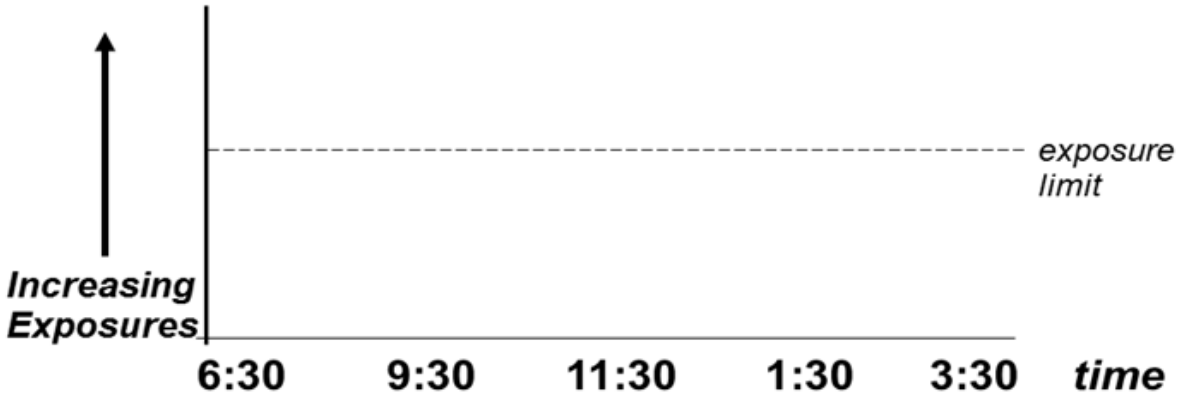

Figura 30

Los límites de exposición se basan en promedios de 8 o 10 horas, en topes (los que no se pueden exceder) o en 15 minutos de exposición máxima. Las exposiciones deben mantenerse por debajo de los PEL de OSHA. La mayoría de los límites de exposición se refieren a la exposición a través del aire. Algunas sustancias químicas tienen topes que no se pueden exceder. Los límites de exposición no toman en cuenta la exposición de múltiples sustancias químicas.

Sección 6: Otras Formas de Comunicar los Peligros

Tipos de sistemas de etiquetado

Existen distintos tipos de sistemas de etiquetado que deben estar en uso para ayudarle a reconocer cuando las sustancias químicas están presentes en el área de trabajo. Estos sistemas de etiquetado son:

- HMIS
- NFPA 704 M
- Placas del Departamento de Transporte
- Etiquetas de productos

Figura 31

Figura 32

Sistema de identificación de materiales peligrosos (HMIS)

La codificación de colores del HMIS clasifica los riesgos y recomienda el equipo de protección personal (PPE).

El Sistema de identificación de materiales peligrosos (HMIS) usa etiquetas rectangulares que pueden encontrarse tanto en recipientes de almacenamiento voluminoso o en pequeños recipientes en una obra. El sistema HMIS se ocupa de cuatro temas. Para la salud, inflamabilidad y reactividad, se asigna un número del 0 al 4 basado en la gravedad de los riesgos, igual que el de la NFPA. Entre más alto es el número, más grave es el peligro. La cuarta designación es para el equipo de protección personal o PPE. Las recomendaciones del PPE se refieren al uso normal y podrían no ser adecuadas para una emergencia. Aunque los

efectos crónicos sobre la salud generalmente no están clasificados, podrían estar indicados después de la clasificación del riesgo para la salud o por medio de advertencias escritas en la sección blanca que aparece en la parte superior de la etiqueta.

Las etiquetas del HMIS también contienen el nombre del producto e información de riesgos más específica que puede ser:

- Vías de penetración
- Riesgos para la salud
- Órganos específicos y efectos
- Riesgos físicos

La figura de diamante "704 M" de la NFPA se usa ampliamente.

Creada para dar una advertencia rápida a los bomberos sobre los potenciales riesgos químicos en un incendio, el sistema de etiquetado de la National Fire Protection Association (NFPA) ofrece información importante para los trabajadores de la construcción. Sin embargo, el uso de las etiquetas de la NFPA no es exigido por OSHA. La etiqueta de la NFPA es una figura de diamante formada por otros cuatro diamantes más pequeños en distintos colores: rojo (inflamabilidad), azul (riesgo para la salud), amarillo (riesgo de reactividad) y blanco (peligros específicos). Los cuadros rojo, azul y amarillo contienen una clasificación de riesgo del 0 al 4, que indica la severidad del riesgo, siendo 4 la más peligrosa. El cuadro blanco está reservado para indicar riesgos específicos, como el riesgo de mezclar con agua o radiación.

Figura 33. NFPA 704 M Diamond

Tomando la sustancia química de esta muestra, conteste:

1. ¿Cuál es el riesgo o peligro más grande: de salud, incendio o reactividad?

2. ¿Cuál es el peligro específico?

El Departmento de Transporte exige que los vehículos que transportan sustancias químicas peligrosas lleven placas informativas.

El Departmento de Transporte (DOT) exige que los camiones y tráilers, los vagones de tren y muchos navíos marinos lleven visible las placas que indican los riesgos de los materiales transportados. Las etiquetas (que generalmente son más pequeñas) van adheridas a los paquetes, bidones y otros envases pequeños transportados o almacenados. Las placas y etiquetas son adicionales a los requisitos de OSHA.

Placas de HAZMAT

Las placas son elementos fijos en forma de cuadro de un tamaño de 10 ¾ pulgadas apoyados sobre su vértice, con lo cual forman un diamante (rombo). Se colocan en los cuatro lados de todo vehículo que transporte una cantidad de materiales peligrosos y que esté obligado a llevar placas.

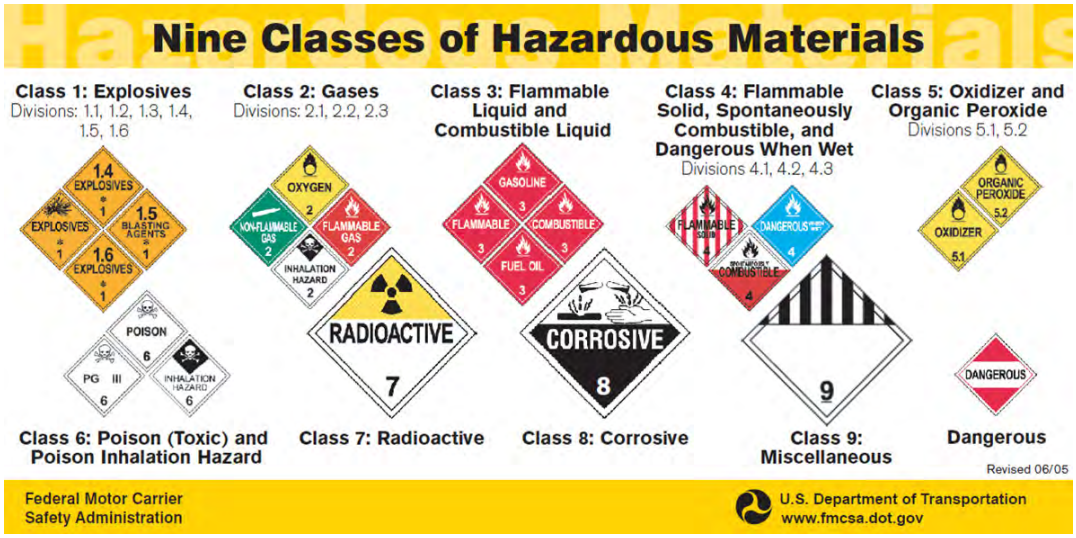

Figura 34

Las placas ofrecen información de reconocimiento de distintas maneras:

- Color de fondo
- Símbolo en la parte superior
- Texto que indica la clase de riesgo o el número de identificación en el centro
- El número de las Naciones Unidas que identifica el peligro en la parte inferior

Para el transporte, los pictogramas tendrán los colores de fondo y de símbolos usados en la actualidad.

Sección 7: Control de Riesgos

La jerarquía de controles puede protegerlos contra las sustancias químicas peligrosas

La jerarquía de controles es una lista de métodos, que van desde el más deseable hasta el menos deseable y que enfatiza el control de un riesgo propiamente donde se origina. Esto se logra dando preferencia a la eliminación completa del riesgo; luego viene el uso de controles de ingeniería. Estas estrategias deben usarse primero, siempre que se pueda, porque tienen menos propensidad al error humano y porque perturban menos y son menos incómodas para que la gente las use y para la gente que trabaja en la zona. Pero independientemente del método usado, recuerde que la efectividad debe monitorearse periódicamente.

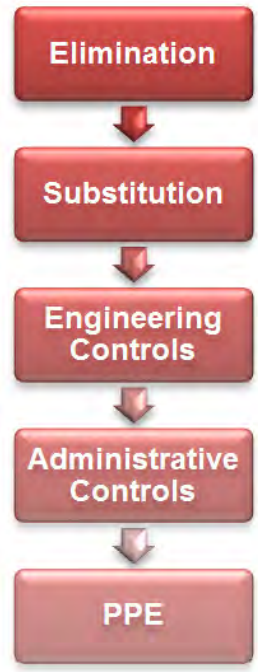

Figura 35

La idea en general es poder diseñar o rediseñar el lugar de trabajo de modo que se adapte a las necesidades de los trabajadores. Capacitar a los trabajadores y proporcionar el equipo de protección personal necesario es una necesidad, pero crear un lugar de trabajo seguro y sano es, en última instancia, el objetivo primordial. Para alcanzar ese objetivo, es necesario emplear métodos tales como sustituir sustancias químicas o procesos dañinos por otros que sean menos dañinos, diseñar estaciones de trabajo para causar menos daño a los trabajadores e integrar la salud y la seguridad del lugar de trabajo en las etapas de diseño de los lugares de trabajo y del desarrollo de los procesos de trabajo.

Eliminar o sustituir sustancias químicas por otras menos dañinas.

¿Hay alguna sustancia química que podría eliminar o sustituir en su trabajo? ¿Será posible hacer esa sustitución? Las sustancias químicas y los trabajos ecológicos pueden ser una buena manera de sustituir o eliminar los riesgos. **Sin embargo, cabe señalar que el hecho de que algo sea "ecológico", no siempre quiere decir que es seguro.**


Figura 36. Estudiante de Job Corp utilizando una espuma en aerosol a base de soja.

Figura 37

- **Hardiplank: 10-50% sílice**
- **Weatherboard (tabla de chilla): 45-55% sílice**

Las tablas de fibra de cemento son de un material parecido al concreto usado en tejas para los tejados, paneles, material de base para pisos y revestimiento exterior de paredes. Es fuerte, duradero, resistente al moho y a la intemperie y no es combustible. Sin embargo, es potencialmente peligroso para los trabajadores debido a su composición de sílice cristalino. Los trabajadores que cortan con este material o trabajan con él de tal forma que producen polvo, corren el riesgo de verse expuestos al sílice. Los trabajadores que están cerca de donde se realiza trabajo con ese material, también podrían verse afectados por el riesgo del sílice.

WISHA es el grupo encargado de hacer cumplir la ley de salud y seguridad industrial de Washington (Washington Industrial Safety and Health Act). Unos datos de inspección de WISHA demostraron que 5 de 7 trabajadores que usaban sierras circulares al aire libre en paneles de fibra de cemento para el revestimiento de paredes habían sufrido una exposición de sílice por encima de lo aceptable según los TLV de la ACGIH.

Use controles de ingeniería para reducir las exposiciones químicas.

Existen controles de ingeniería que emplean métodos de humidificación para reducir la exposición al polvo en las obras de construcción.

Figura 38

Los controles de ventilación son eficaces para la exposición del polvo en la construcción

Figura 39. Apuntando sin controles

Figura 40. Apuntando con los controles

El recurso Construction Solutions de CPWR le puede ayudar a seleccionar controles eficaces para su especialidad

http://www.cpwrconstructionsolutions.org

Figura 41. CPWR Construction Solutions

eLCOSH es una fuente valiosa de materiales de capacitación e información para los trabajadores.

http://www.elcosh.org

Figura 42. eLCOSH website.

Los controles administrativos también pueden reducir la exposición química.

Los controles administrativos consisten en cualquier procedimiento que limite significativamente la exposición diaria por medio del control o la manipulación del programa de trabajo o de la manera en que se realiza el trabajo. Los controles administrativos no son tan eficaces como los controles de ingeniería, pero muchos son rápidos y baratos en la práctica.

- Capacitación e información
- Señalización
- Mantenimiento del equipo para prevenir fugas y emanaciones
- Procedimientos de operación estándar (SOP)
- Rotación de trabajadores
- Programación de tareas cuando el uso de una sustancia química es reducido

Figura 43. La señalización es un control administrativo.

El equipo de protección personal (PPE) está de último en la lista jerárquica de controles. ¿Por qué?

El PPE es un componente exigido de la capacitación en cumplimiento de la norma Hazcom, 29 CFR 1910.1200(h)(3)(iii).

Los respiradores aprobados por NIOSH pueden proteger los pulmones contra la exposición química.

Figura 44

Después de agotar todos los controles, puede ser que lo único que quede para protegerse sea el PPE. En la mayoría de las SDS, se ofrecerá una lista de PPE recomendado, pero es posible que lo único que diga sea algo así: “Para la manipulación de sustancias químicas, use guantes y un respirador adecuados”. Pero, ¿qué significa “adecuado”? Es posible que no describan en detalle ni ofrezcan una lista del tipo de PPE que necesita. En ese caso, usted tendrá que buscar la información en alguna de las fuentes ya mencionadas o, aun mejor, quizás el higienista industrial ya haya elegido el PPE correcto para su uso.

Los empleadores deben tener un programa de protección respiratoria que incluya la aprobación médica, la prueba de ajuste y la selección correcta.

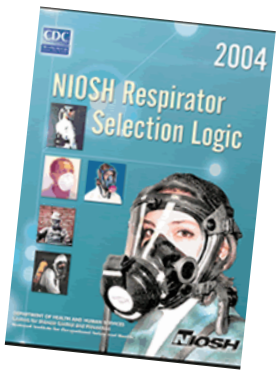

Figura 45

Siempre que use PPE, asegúrese de:

- Usar el PPE seleccionado para un riesgo determinado y que le quede como debe ser
- Ponerse el PPE solo si ha sido capacitado
- Siempre inspeccionar el PPE antes de usarlo
- NUNCA usar un PPE dañado
- Usar el PPE solamente como último recurso para controlar los riesgos.

¿Conlleva algún tipo de problema de salud o de seguridad el uso del PPE?

Sí. Los siguientes son problemas comunes:

- Acaloramiento peligroso
- Movimiento limitado
- Visión limitada
- Oído limitado
- Claustrofobia

Sección 8: Emergencias y Primeros Auxilios

Infórmese sobre los preparativos de primeros auxilios que existen en su lugar de trabajo y lea las etiquetas y las SDS antes de usar las sustancias químicas.

¿Qué pasa si encuentra una fuga?

Las diferencias entre una emergencia y una “fuga incidental” son nivel de peligro, riesgo, familiaridad y capacitación. RECUERDE: Usted no está capacitado para responder en caso de emergencia. Infórmele a su supervisor si hay algún olor inusual, fugas o emanaciones, etc. Informe a los compañeros de trabajo y abandone el área donde haya ocurrido una fuga grande o una emanación química. Para mayor información, consulte el programa de respuesta a fugas de su empleador.

Para responder a un incendio de cualquier tamaño, deberá estar capacitado. Infórmese sobre el plan de acción para combatir incendios en la obra.

Figura 45. Foto cortesía de Whiting Turner Construction Company y GW University.

¿Qué pasa si se ha visto expuesto a una sustancia química?

1. Avísele a su supervisor y su sindicato.
2. Averigüe qué sustancias químicas están involucradas.
3. Obedezca las directivas de primeros auxilios que aparecen en la SDS.
4. Obtenga ayuda médica si es necesario.
5. Llame a los encargados de salud y seguridad para evaluar la situación y la causa de la exposición antes de regresar a trabajar.

Ahora que ha tomado esta clase, ¿qué acciones tomará en su lugar de trabajo para averiguar más sobre las sustancias químicas con las que trabaja?

Fuentes de referencia

Agencia Europea de Sustancias y Mezclas Químicas (ECHA), (2001). http: //echa.europa.eu/

OSHA, (2011). 29 CFR 1910.1200. Hazard Communication Standard. http: //www.osha.gov/dsg/hazcom/standards.html

OSHA, (2008). Chemical Hazard Communication. Documento 3084.

DiNardi, Salvatore, Silk, Jennifer. (1997). The Occupational Environment-Its Evaluation and Control. AIHA Press; Capítulo 40.

United Nations, (2003). Sistema globalmente armonizado de clasificación y etiquetado de productos químicos (GHS), también conocido con el nombre de “The Purple Book”.

Apéndice A: Safety Data Sheets

The following pages of this appendix contain examples of material safety data sheets (MSDS's) concerning the following chemicals:

SAFETY DATA SHEET

13024/13034

Section 1. Identification

Product name : MINWAX® Super Fast Drying Polyurethane For Floors (350 VOC) Semi-Gloss

Product code : 13024/13034

Other means of identification : Not available.

Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against

Paint or paint related material.

Manufacturer : MINWAX Company
10 Mountainview Road
Upper Saddle River, NJ 07458

Emergency telephone number of the company : US/Canada: (216) 566-2917
Mexico: CHEMTREC México 01-800-681-9531. Available 24 hours and 365 days per year

Product Information Telephone Number : US/Canada: (800) 523-9299
Mexico: 01-800-71-73-123 / (52) 53-33-15-01

Regulatory Information Telephone Number : US / Canada: (216) 566-2902
Mexico: 01-800-71-73-123 / (52) 53-33-15-01

Transportation Emergency Telephone Number : US / Canada: (800) 424-9300
Mexico: SETIQ 01-800-00-214-00 / (52) 55-5559-1588 24 hours / 365 days a year

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 3
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A
SKIN SENSITIZATION - Category 1
CARCINOGENICITY - Category 2
TOXIC TO REPRODUCTION (Fertility) - Category 2
TOXIC TO REPRODUCTION (Unborn child) - Category 2
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
ASPIRATION HAZARD - Category 1

Percentage of the mixture consisting of ingredient(s) of unknown oral toxicity: 27.8%
Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 36.8%
Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 36.8%

GHS label elements

Hazard pictograms :

Signal word : Danger

Section 2. Hazards identification

Hazard statements : Flammable liquid and vapor.
Causes serious eye irritation.
May cause an allergic skin reaction.
Suspected of damaging fertility or the unborn child.
Suspected of causing cancer.
May be fatal if swallowed and enters airways.
May cause respiratory irritation.
May cause drowsiness or dizziness.
May cause damage to organs through prolonged or repeated exposure.

Precautionary statements

General : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves. Wear eye or face protection. Wear protective clothing. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Do not breathe vapor. Wash hands thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace.

Response : Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Store locked up. Store in a well-ventilated place. Keep cool.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements DELAYED EFFECTS FROM LONG TERM OVEREXPOSURE. Contains solvents which can cause permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal. WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Please refer to the SDS for additional information. Keep out of reach of children. Do not transfer contents to other containers for storage.

Hazards not otherwise classified : DANGER: Rags, steel wool, other waste soaked with this product, and sanding residue may spontaneously catch fire if improperly discarded. Immediately place rags, steel wool, other waste soaked with this product, and sanding residue in a sealed, water-filled, metal container. Dispose of in accordance with local fire regulations.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Not available.

CAS number/other identifiers

Ingredient name	% by weight	CAS number
Light Aliphatic Hydrocarbon	≥25 - ≤50	64742-47-8
Octamethylcyclotetrasiloxane	≥10 - ≤25	556-67-2
p-Chlorobenzotrifluoride	≤5	98-56-6
Decamethylcyclopentasiloxane	≤5	541-02-6
Vegetable Oil	≤5	68956-68-3
Amorphous Precipitated Silica	≤3	112926-00-8
Hydrotreated Heavy Petroleum Naphtha	<1	64742-48-9
Methyl Ethyl Ketoxime	≤0.3	96-29-7

Section 3. Composition/information on ingredients

Zirconium 2-Ethylhexanoate	≤0.3	22464-99-9
Cobalt 2-Ethylhexanoate	≤0.3	136-52-7
Med. Aliphatic Hydrocarbon Solvent	≤0.3	64742-88-7
Xylene mixed isomers	≤0.3	1330-20-7
Heavy Aliphatic Solvent	≤0.3	64742-82-1
Calcium 2-Ethylhexanoate	≤0.3	136-51-6
2-(2-Methoxyethoxy)-ethanol	≤0.3	111-77-3

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness. May cause respiratory irritation.

Skin contact : May cause an allergic skin reaction.

Ingestion : Can cause central nervous system (CNS) depression. May be fatal if swallowed and enters airways.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits (OSHA United States)

Ingredient name	Exposure limits
Light Aliphatic Hydrocarbon	**ACGIH TLV (United States, 3/2017). Absorbed through skin.** TWA: 200 mg/m³, (as total hydrocarbon vapor) 8 hours.
Octamethylcyclotetrasiloxane	None.
p-Chlorobenzotrifluoride	None.
Decamethylcyclopentasiloxane	None.
Vegetable Oil	**NIOSH REL (United States, 10/2016).** TWA: 5 mg/m³ 10 hours. Form: Respirable fraction TWA: 10 mg/m³ 10 hours. Form: Total **OSHA PEL (United States, 6/2016).** TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust
Amorphous Precipitated Silica	**NIOSH REL (United States, 10/2016).** TWA: 6 mg/m³ 10 hours.
Hydrotreated Heavy Petroleum Naphtha	None.
Methyl Ethyl Ketoxime	**AIHA WEEL (United States, 10/2011). Skin sensitizer.** TWA: 10 ppm 8 hours.
Zirconium 2-Ethylhexanoate	**ACGIH TLV (United States, 3/2017).** TWA: 5 mg/m³, (as Zr) 8 hours. STEL: 10 mg/m³, (as Zr) 15 minutes. **NIOSH REL (United States, 10/2016).** TWA: 5 mg/m³, (as Zr) 10 hours. STEL: 10 mg/m³, (as Zr) 15 minutes. **OSHA PEL (United States, 6/2016).** TWA: 5 mg/m³, (as Zr) 8 hours.
Cobalt 2-Ethylhexanoate	**ACGIH TLV (United States, 3/2017).** TWA: 0.02 mg/m³, (as Co) 8 hours.
Med. Aliphatic Hydrocarbon Solvent	**OSHA PEL (United States, 6/2016).** TWA: 100 ppm 8 hours. TWA: 400 mg/m³ 8 hours.
Xylene mixed isomers	**ACGIH TLV (United States, 3/2017).** TWA: 100 ppm 8 hours. TWA: 434 mg/m³ 8 hours. STEL: 150 ppm 15 minutes. STEL: 651 mg/m³ 15 minutes. **OSHA PEL (United States, 6/2016).** TWA: 100 ppm 8 hours. TWA: 435 mg/m³ 8 hours.
Heavy Aliphatic Solvent	None.
Calcium 2-Ethylhexanoate	None.
2-(2-Methoxyethoxy)-ethanol	None.

Occupational exposure limits (Canada)

Section 5. Fire-fighting measures

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not swallow. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits (OSHA United States)

Ingredient name	Exposure limits
Light Aliphatic Hydrocarbon	**ACGIH TLV (United States, 3/2017). Absorbed through skin.** TWA: 200 mg/m³, (as total hydrocarbon vapor) 8 hours.
Octamethylcyclotetrasiloxane	None.
p-Chlorobenzotrifluoride	None.
Decamethylcyclopentasiloxane	None.
Vegetable Oil	**NIOSH REL (United States, 10/2016).** TWA: 5 mg/m³ 10 hours. Form: Respirable fraction TWA: 10 mg/m³ 10 hours. Form: Total **OSHA PEL (United States, 6/2016).** TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust
Amorphous Precipitated Silica	**NIOSH REL (United States, 10/2016).** TWA: 6 mg/m³ 10 hours.
Hydrotreated Heavy Petroleum Naphtha	None.
Methyl Ethyl Ketoxime	**AIHA WEEL (United States, 10/2011). Skin sensitizer.** TWA: 10 ppm 8 hours.
Zirconium 2-Ethylhexanoate	**ACGIH TLV (United States, 3/2017).** TWA: 5 mg/m³, (as Zr) 8 hours. STEL: 10 mg/m³, (as Zr) 15 minutes. **NIOSH REL (United States, 10/2016).** TWA: 5 mg/m³, (as Zr) 10 hours. STEL: 10 mg/m³, (as Zr) 15 minutes. **OSHA PEL (United States, 6/2016).** TWA: 5 mg/m³, (as Zr) 8 hours.
Cobalt 2-Ethylhexanoate	**ACGIH TLV (United States, 3/2017).** TWA: 0.02 mg/m³, (as Co) 8 hours.
Med. Aliphatic Hydrocarbon Solvent	**OSHA PEL (United States, 6/2016).** TWA: 100 ppm 8 hours. TWA: 400 mg/m³ 8 hours.
Xylene mixed isomers	**ACGIH TLV (United States, 3/2017).** TWA: 100 ppm 8 hours. TWA: 434 mg/m³ 8 hours. STEL: 150 ppm 15 minutes. STEL: 651 mg/m³ 15 minutes. **OSHA PEL (United States, 6/2016).** TWA: 100 ppm 8 hours. TWA: 435 mg/m³ 8 hours.
Heavy Aliphatic Solvent	None.
Calcium 2-Ethylhexanoate	None.
2-(2-Methoxyethoxy)-ethanol	None.

Occupational exposure limits (Canada)

Section 8. Exposure controls/personal protection

Ingredient name	Exposure limits
Solvent naphtha (petroleum), medium aliph.	**CA British Columbia Provincial (Canada, 6/2017). Absorbed through skin.** TWA: 200 mg/m³, (as total hydrocarbon vapour) 8 hours. **CA Alberta Provincial (Canada, 4/2009). Absorbed through skin.** 8 hrs OEL: 200 mg/m³, (as total hydrocarbon vapour) 8 hours. **CA Ontario Provincial (Canada, 7/2015). Absorbed through skin.** TWA: 200 mg/m³, (as total hydrocarbon vapour) 8 hours.
Methyl Ethyl Ketoxime	**AIHA WEEL (United States, 10/2011). Skin sensitizer.** TWA: 10 ppm 8 hours.
Zirconium 2-Ethylhexanoate	**CA Alberta Provincial (Canada, 4/2009).** 8 hrs OEL: 5 mg/m³, (as Zr) 8 hours. 15 min OEL: 10 mg/m³, (as Zr) 15 minutes. **CA British Columbia Provincial (Canada, 6/2017).** TWA: 5 mg/m³, (as Zr) 8 hours. STEL: 10 mg/m³, (as Zr) 15 minutes. **CA Quebec Provincial (Canada, 1/2014).** TWAEV: 5 mg/m³, (as Zr) 8 hours. STEV: 10 mg/m³, (as Zr) 15 minutes. **CA Ontario Provincial (Canada, 7/2015).** STEL: 10 mg/m³, (as Zr) 15 minutes. TWA: 5 mg/m³, (as Zr) 8 hours.
Cobalt 2-Ethylhexanoate	**CA Ontario Provincial (Canada, 7/2015).** TWA: 0.02 mg/m³, (as Co) 8 hours. Form: Inorganic **CA British Columbia Provincial (Canada, 6/2017).** TWA: 0.02 mg/m³, (as Co) 8 hours. **CA Quebec Provincial (Canada, 1/2014). Skin sensitizer.** TWAEV: 0.02 mg/m³, (as Co) 8 hours. **CA Saskatchewan Provincial (Canada, 7/2013).** STEL: 0.06 mg/m³, (measured as Co) 15 minutes. TWA: 0.02 mg/m³, (measured as Co) 8 hours.

Occupational exposure limits (Mexico)

Ingredient name	Exposure limits
Solvent naphtha (petroleum), medium aliph.	**ACGIH TLV (United States, 3/2017). Absorbed through skin.** TWA: 200 mg/m³, (as total hydrocarbon vapor) 8 hours.
Zirconium 2-Ethylhexanoate	**NOM-010-STPS-2014 (Mexico, 4/2016).** TWA: 5 mg/m³, (as Zr) 8 hours. STEL: 10 mg/m³, (as Zr) 15 minutes.
Cobalt 2-Ethylhexanoate	**NOM-010-STPS-2014 (Mexico, 4/2016).** TWA: 0.02 mg/m³, (as Co) 8 hours.

Section 8. Exposure controls/personal protection

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.

Color : Not available.

Odor : Not available.

Odor threshold : Not available.

pH : Not available.

Melting point/freezing point : Not available.

Boiling point/boiling range : 138°C (280.4°F)

Flash point : Closed cup: 42°C (107.6°F) [Pensky-Martens Closed Cup]

Evaporation rate : 0.13 (butyl acetate = 1)

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Lower: 0.75%
Upper: 10.5%

Section 9. Physical and chemical properties

Vapor pressure : 0.71 kPa (5.3 mm Hg) [at 20°C]

Vapor density : 5 [Air = 1]

Relative density : 0.95

Solubility : Not available.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Kinematic (40°C (104°F)): <0.205 cm^2/s (<20.5 cSt)

Molecular weight : Not applicable.

Aerosol product

Heat of combustion : 16.259 kJ/g

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials : Reactive or incompatible with the following materials:
oxidizing materials

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Octamethylcyclotetrasiloxane	LC50 Inhalation Vapor	Rat	36 g/m³	4 hours
	LD50 Dermal	Rat	1770 mg/kg	-
	LD50 Oral	Rat	1540 mg/kg	-
p-Chlorobenzotrifluoride	LD50 Oral	Rat	13 g/kg	-
Decamethylcyclopentasiloxane	LD50 Oral	Rat	>24134 mg/kg	-
Hydrotreated Heavy Petroleum Naphtha	LC50 Inhalation Vapor	Rat	8500 mg/m³	4 hours
	LD50 Oral	Rat	>6 g/kg	-
Methyl Ethyl Ketoxime	LD50 Oral	Rat	930 mg/kg	-
Zirconium 2-Ethylhexanoate	LD50 Dermal	Rabbit	>5 g/kg	-
	LD50 Oral	Rat	>5 g/kg	-
Cobalt 2-Ethylhexanoate	LD50 Dermal	Rabbit	>5 g/kg	-
	LD50 Oral	Rat	1.22 g/kg	-
Xylene mixed isomers	LC50 Inhalation Gas.	Rat	5000 ppm	4 hours
	LD50 Oral	Rat	4300 mg/kg	-

Irritation/Corrosion

Section 11. Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
Octamethylcyclotetrasiloxane	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
Decamethylcyclopentasiloxane	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
Methyl Ethyl Ketoxime	Eyes - Severe irritant	Rabbit	-	100 microliters	-
Xylene mixed isomers	Eyes - Mild irritant	Rabbit	-	87 milligrams	-
	Eyes - Severe irritant	Rabbit	-	24 hours 5 milligrams	-
	Skin - Mild irritant	Rat	-	8 hours 60 microliters	-
	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Moderate irritant	Rabbit	-	100 Percent	-
2-(2-Methoxyethoxy)-ethanol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	500 milligrams	-

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
Amorphous Precipitated Silica	-	3	-
Cobalt 2-Ethylhexanoate	-	2B	Reasonably anticipated to be a human carcinogen.
Xylene mixed isomers	-	3	-

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Light Aliphatic Hydrocarbon	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects
p-Chlorobenzotrifluoride	Category 3	Not applicable.	Respiratory tract irritation
Hydrotreated Heavy Petroleum Naphtha	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects
Med. Aliphatic Hydrocarbon Solvent	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects
Xylene mixed isomers	Category 3	Not applicable.	Respiratory tract irritation

Section 11. Toxicological information

Heavy Aliphatic Solvent	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects
2-(2-Methoxyethoxy)-ethanol	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Light Aliphatic Hydrocarbon	Category 2	Not determined	Not determined
Hydrotreated Heavy Petroleum Naphtha	Category 2	Not determined	Not determined
Med. Aliphatic Hydrocarbon Solvent	Category 1	Not determined	Not determined
Xylene mixed isomers	Category 2	Not determined	Not determined
Heavy Aliphatic Solvent	Category 1	Not determined	central nervous system (CNS)
2-(2-Methoxyethoxy)-ethanol	Category 2	Not determined	Not determined

Aspiration hazard

Name	Result
Light Aliphatic Hydrocarbon	ASPIRATION HAZARD - Category 1
Hydrotreated Heavy Petroleum Naphtha	ASPIRATION HAZARD - Category 1
Med. Aliphatic Hydrocarbon Solvent	ASPIRATION HAZARD - Category 1
Xylene mixed isomers	ASPIRATION HAZARD - Category 1
Heavy Aliphatic Solvent	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness. May cause respiratory irritation.

Skin contact : May cause an allergic skin reaction.

Ingestion : Can cause central nervous system (CNS) depression. May be fatal if swallowed and enters airways.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness
reduced fetal weight
increase in fetal deaths
skeletal malformations

Skin contact : Adverse symptoms may include the following:
irritation
redness
reduced fetal weight
increase in fetal deaths
skeletal malformations

Ingestion : Adverse symptoms may include the following:
nausea or vomiting
reduced fetal weight
increase in fetal deaths
skeletal malformations

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : Suspected of damaging the unborn child.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : Suspected of damaging fertility.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Oral	9269.8 mg/kg
Dermal	9326.9 mg/kg

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Light Aliphatic Hydrocarbon	Acute LC50 2200 µg/l Fresh water	Fish - Lepomis macrochirus	4 days
Octamethylcyclotetrasiloxane	Chronic NOEC 1.7 to 15 µg/l Fresh water	Daphnia - Daphnia magna	21 days
	Chronic NOEC 4.4 µg/l Fresh water	Fish - Oncorhynchus mykiss - Egg	93 days
Methyl Ethyl Ketoxime	Acute LC50 843000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
Xylene mixed isomers	Acute LC50 8500 µg/l Marine water	Crustaceans - Palaemonetes pugio	48 hours
	Acute LC50 13400 µg/l Fresh water	Fish - Pimephales promelas	96 hours
2-(2-Methoxyethoxy)-ethanol	Acute EC50 >930 ppm Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 7500000 µg/l Fresh water	Fish - Lepomis macrochirus	96 hours

Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Xylene mixed isomers	-	-	Readily

Section 12. Ecological information

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Octamethylcyclotetrasiloxane	-	13400	high
Decamethylcyclopentasiloxane	-	7060	high
Hydrotreated Heavy Petroleum Naphtha	-	10 to 2500	high
Methyl Ethyl Ketoxime	-	2.5 to 5.8	low
Zirconium 2-Ethylhexanoate	-	2.96	low
Cobalt 2-Ethylhexanoate	-	15600	high
Xylene mixed isomers	-	8.1 to 25.9	low
Heavy Aliphatic Solvent	-	10 to 2500	high
Calcium 2-Ethylhexanoate	-	2.96	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	IATA	IMDG
UN number	UN1263	UN1263	UN1263	UN1263	UN1263
UN proper shipping name	PAINT	PAINT	PAINT	PAINT	PAINT
Transport hazard class(es)	3 	3 	3 	3 	3 
Packing group	III	III	III	III	III
Environmental hazards	No.	No.	No.	Yes. The environmentally hazardous substance mark is not required.	No.

Section 14. Transport information

Additional information	This product may be re-classified as "Combustible Liquid," unless transported by vessel or aircraft. Non-bulk packages (less than or equal to 119 gal) of combustible liquids are not regulated as hazardous materials. **ERG No.** 128	Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2. 18-2.19 (Class 3). **ERG No.** 128	- **ERG No.** 128	The environmentally hazardous substance mark may appear if required by other transportation regulations.	**Emergency schedules** F-E, S-E

Special precautions for user : Multi-modal shipping descriptions are provided for informational purposes and do not consider container sizes. The presence of a shipping description for a particular mode of transport (sea, air, etc.), does not indicate that the product is packaged suitably for that mode of transport. All packaging must be reviewed for suitability prior to shipment, and compliance with the applicable regulations is the sole responsibility of the person offering the product for transport. People loading and unloading dangerous goods must be trained on all of the risks deriving from the substances and on all actions in case of emergency situations.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Proper shipping name : Not available.
Ship type : Not available.
Pollution category : Not available.

Section 15. Regulatory information

SARA 313

SARA 313 (40 CFR 372.45) supplier notification can be found on the Environmental Data Sheet.

California Prop. 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

International regulations

International lists : **Australia inventory (AICS)**: Not determined.
China inventory (IECSC): Not determined.
Japan inventory (ENCS): Not determined.
Japan inventory (ISHL): Not determined.
Korea inventory (KECI): Not determined.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): Not determined.
Philippines inventory (PICCS): Not determined.
Taiwan Chemical Substances Inventory (TCSI): Not determined.
Thailand inventory: Not determined.
Turkey inventory: Not determined.
Vietnam inventory: Not determined.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	*	3
Flammability		2
Physical hazards		0

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

Procedure used to derive the classification

Classification	Justification
FLAMMABLE LIQUIDS - Category 3	On basis of test data
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A	Calculation method
SKIN SENSITIZATION - Category 1	Calculation method
CARCINOGENICITY - Category 2	Calculation method
TOXIC TO REPRODUCTION (Fertility) - Category 2	Calculation method
TOXIC TO REPRODUCTION (Unborn child) - Category 2	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2	Calculation method
ASPIRATION HAZARD - Category 1	Calculation method

History

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Version : 14

Key to abbreviations :
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Notice to reader

It is recommended that each customer or recipient of this Safety Data Sheet (SDS) study it carefully and consult resources, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. This information is provided in good faith and believed to be accurate as of the effective date herein. However, no warranty, express or implied, is given. The information presented here applies only to the product as shipped. The addition of any material can change the composition, hazards and risks of the product. Products shall not be repackaged, modified, or tinted except as specifically instructed by the manufacturer, including but not limited to the incorporation of products not specified by the manufacturer, or the use or addition of products in proportions not specified by the manufacturer. Regulatory requirements are subject to change and may differ between various locations and jurisdictions. The customer/buyer/user is responsible to ensure that his activities comply with all country, federal, state, provincial or local laws. The conditions for use of the product are not under the control of the manufacturer; the customer/buyer/user is responsible to determine the conditions necessary for the safe use of this product. The customer/buyer/user

Section 16. Other information

should not use the product for any purpose other than the purpose shown in the applicable section of this SDS without first referring to the supplier and obtaining written handling instructions. Due to the proliferation of sources for information such as manufacturer-specific SDS, the manufacturer cannot be responsible for SDSs obtained from any other source.

Safety Data Sheet

Revision Number: 002.0

Issue date: 12/15/2014

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: **Loctite® PL300® Foamboard Construction Adhesive**
IDH number: 1421941
Product type: Water based adhesive
Restriction of Use: None identified
Region: United States
Company address:
Henkel Corporation
One Henkel Way
Rocky Hill, Connecticut 06067
Contact information:
Telephone: +1 (800) 624-7767
MEDICAL EMERGENCY Phone: Poison Control Center 1-877-671-4608 (toll free) or 1-303-592-1711 TRANSPORT EMERGENCY Phone: CHEMTREC 1-800-424-9300 (toll free) or 1-703-527-3887

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING: ABRASION COULD RELEASE RESPIRABLE PARTICLES OF SILICA QUARTZ, A CANCER HAZARD BY INHALATION. NORMAL USE OF THIS PRODUCT CAUSES NO SUCH RELEASE.

CAUSES SERIOUS EYE IRRITATION.

HAZARD CLASS	HAZARD CATEGORY
EYE IRRITATION	2A

PICTOGRAM(S)

Precautionary Statements

Prevention:
Wash thoroughly after handling. Wear eye and face protection.

Response:
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to remove. Continue rinsing. If eye irritation persists: Get medical attention.

Storage: Not prescribed
Disposal: Not prescribed

Classification complies with OSHA Hazard Communication Standard (29 CFR 1910.1200) and is consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Component(s)	CAS Number	Percentage*
Limestone	1317-65-3	30 - 60
Quartz (SiO2)	14808-60-7	0.1 - 1

* Exact percentage is a trade secret. Concentration range is provided to assist users in providing appropriate protections.

4. FIRST AID MEASURES

Inhalation:	No specific treatment is necessary since material is not likely to be hazardous by inhalation.
Skin contact:	Wash affected area immediately with soap and water.
Eye contact:	Immediately flush eyes with plenty of water for at least 15 minutes. If symptoms develop and persist, get medical attention.
Ingestion:	Consult a physician if necessary.
Symptoms:	See Section 11.

5. FIRE FIGHTING MEASURES

Extinguishing media:	Carbon dioxide, foam, powder Water fog.
Special firefighting procedures:	Use water spray to keep fire exposed containers cool and disperse vapors.
Unusual fire or explosion hazards:	Closed containers may rupture (due to build up of pressure) when exposed to extreme heat.
Hazardous combustion products:	Oxides of carbon. Oxides of nitrogen.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions:	Not available.
Clean-up methods:	Absorb spill with inert material. Shovel material into appropriate container for disposal.

7. HANDLING AND STORAGE

Handling:	Avoid prolonged or repeated skin contact with this material. Keep out of the reach of children.
Storage:	For safe storage, store at or above 0 °C (32°F) Keep from freezing. Store in a cool, dry area. Keep containers closed when not in use.

For information on product shelf life, please review labels on container or check the Technical Data Sheet.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous Component(s)	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Limestone	10 mg/m3 TWA Total dust.	5 mg/m3 PEL Respirable fraction. 15 mg/m3 PEL Total dust.	None	None
Quartz (SiO2)	0.025 mg/m3 TWA Respirable fraction.	2.4 MPPCF TWA Respirable. 0.1 mg/m3 TWA Respirable. 0.3 mg/m3 TWA Total dust.	None	None

Engineering controls: Use local ventilation if general ventilation is insufficient to maintain vapor concentration below established exposure limits.

Respiratory protection: No personal respiratory protective equipment normally required.

Eye/face protection: Safety goggles or safety glasses with side shields.

Skin protection: Suitable protective clothing

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: pasty
Color: Blue
Odor: Mild, acrylic
Odor threshold: Not available.
pH: 7.0 - 7.5
Vapor pressure: 15 mm hg (20 °C (68°F))
Boiling point/range: 100 °C (212°F)
Melting point/ range: Not available.
Specific gravity: 1.224
Vapor density: Heavier than air
Flash point: not applicable
Flammable/Explosive limits - lower: Not available.
Flammable/Explosive limits - upper: Not available.
Autoignition temperature: Not available.
Evaporation rate: < 0.6 (Butyl acetate = 1)
Solubility in water: Soluble
Partition coefficient (n-octanol/water): Not available.
VOC content: < 1 %; 33 g/l (calculated)
Viscosity: 280,000 - 380,000 mPa.s
Decomposition temperature: Not available.

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of storage and use.

Hazardous reactions: Will not occur.

Hazardous decomposition products: Oxides of carbon. Oxides of nitrogen.

Incompatible materials: None

Reactivity: Not available.

Conditions to avoid: Heat. Do not freeze.

11. TOXICOLOGICAL INFORMATION

Relevant routes of exposure: Skin contact

Potential Health Effects/Symptoms

Inhalation: Abrasion of cured material such as by sanding or grinding could release respirable particles of silica quartz, a cancer hazard by inhalation. Normal use of this product causes no such release.
Skin contact: May cause slight irritation to skin.
Eye contact: May cause slight irritation to eyes on contact.
Ingestion: Not expected to be harmful by ingestion. Ingestion of large amounts may produce gastrointestinal disturbances including irritation, nausea, and diarrhea.

Hazardous Component(s)	LD50s and LC50s	Immediate and Delayed Health Effects
Limestone	None	Nuisance dust
Quartz (SiO2)	None	Immune system, Lung, Some evidence of carcinogenicity

Hazardous Component(s)	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Limestone	No	No	No
Quartz (SiO2)	Known To Be Human Carcinogen.	Group 1	No

12. ECOLOGICAL INFORMATION

Ecological information: Not available.

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Dispose of according to Federal, State and local governmental regulations.

Hazardous waste number: It is the responsibility of the user to determine if an item is hazardous as defined in the Resource Conservation and Recovery Act (RCRA) at the time of disposal. Product uses, transformations, mixtures, processes, etc., may render the resulting material hazardous, under the criteria of ignitability, corrosivity, reactivity and toxicity characteristics of the Toxicity Characteristics Leaching Procedure (TCLP) 40 CFR 261.20-24.

14. TRANSPORT INFORMATION

The transport information provided in this section only applies to the material/formulation itself, and is not specific to any package/configuration.

U.S. Department of Transportation Ground (49 CFR)
Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

International Air Transportation (ICAO/IATA)
Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

Water Transportation (IMO/IMDG)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status:	All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12 (b) Export Notification:	None above reporting de minimis
CERCLA/SARA Section 302 EHS:	None above reporting de minimis
CERCLA/SARA Section 311/312:	Delayed Health
CERCLA/SARA Section 313:	None above reporting de minimis
California Proposition 65:	This product contains a chemical known in the State of California to cause cancer. This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Canada Regulatory Information

CEPA DSL/NDSL Status:	All components are listed on or are exempt from listing on the Canadian Domestic Substances List.

16. OTHER INFORMATION

This safety data sheet contains changes from the previous version in sections: New Safety Data Sheet format.

Prepared by: Mary Ellen Roddy, Sr. Regulatory Affairs Specialist

Issue date: 12/15/2014

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SAFETY DATA SHEET

B66W561

Section 1. Identification

Product name : PRO INDUSTRIAL™ Multi-Surface Acrylic Eg-Shel Coating Extra White

Product code : B66W561

Other means of identification : Not available.

Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against

Not applicable.

Manufacturer : THE SHERWIN-WILLIAMS COMPANY
101 W. Prospect Avenue
Cleveland, OH 44115

National contact : Sherwin-Williams Canada Inc.
180 Brunel Road
Mississauga, Ontario L4Z 1T5 Canada

Emergency telephone number of the company : US / Canada: (216) 566-2917
Mexico: SETIQ 01-800-00-214-00 / (52) 55-5559-1588 24 hours / 365 days a year

Product Information Telephone Number : US / Canada: (800) 524-5979
Mexico: Not Available

Regulatory Information Telephone Number : US / Canada: (216) 566-2902
Mexico: Not Available

Transportation Emergency Telephone Number : US / Canada: (800) 424-9300
Mexico: SETIQ 01-800-00-214-00 / (52) 55-5559-1588 24 hours / 365 days a year

Section 2. Hazards identification

Classification of the substance or mixture : CARCINOGENICITY - Category 2
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2

Percentage of the mixture consisting of ingredient(s) of unknown oral toxicity: 22.3%
Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 22.3%
Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 23.4%

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : Suspected of causing cancer.
May cause damage to organs through prolonged or repeated exposure.

Precautionary statements

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves. Wear eye or face protection. Wear protective clothing. Do not breathe vapor.

Section 2. Hazards identification

Response : Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. FOR INDUSTRIAL USE ONLY.

Please refer to the SDS for additional information. Keep out of reach of children. Do not transfer contents to other containers for storage.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Not available.

CAS number/other identifiers

Ingredient name	% by weight	CAS number
Titanium Dioxide	22.3	13463-67-7
2-Butoxyethanol	3.29	111-76-2
Amorphous Silica	3.08	7631-86-9
2-(2-Butoxyethoxy)-ethanol	1.1	112-34-5

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Section 4. First aid measures

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
metal oxide/oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Section 6. Accidental release measures

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits (OSHA United States)

Ingredient name	Exposure limits
Titanium Dioxide	**ACGIH TLV (United States, 3/2017).** TWA: 10 mg/m³ 8 hours. **OSHA PEL (United States, 6/2016).** TWA: 15 mg/m³ 8 hours. Form: Total dust
2-Butoxyethanol	**ACGIH TLV (United States, 3/2017).** TWA: 20 ppm 8 hours. **NIOSH REL (United States, 10/2016).** **Absorbed through skin.** TWA: 5 ppm 10 hours. TWA: 24 mg/m³ 10 hours. **OSHA PEL (United States, 6/2016).** **Absorbed through skin.** TWA: 50 ppm 8 hours. TWA: 240 mg/m³ 8 hours.
Amorphous Silica	**NIOSH REL (United States, 10/2016).** TWA: 6 mg/m³ 10 hours.
2-(2-Butoxyethoxy)-ethanol	**ACGIH TLV (United States, 3/2017).** TWA: 10 ppm 8 hours. Form: Inhalable

Section 8. Exposure controls/personal protection

	fraction and vapor

Occupational exposure limits (Canada)

Ingredient name	Exposure limits
2-Butoxyethanol	**CA Alberta Provincial (Canada, 4/2009).** 8 hrs OEL: 97 mg/m³ 8 hours. 8 hrs OEL: 20 ppm 8 hours. **CA British Columbia Provincial (Canada, 6/2017).** TWA: 20 ppm 8 hours. **CA Ontario Provincial (Canada, 7/2015).** TWA: 20 ppm 8 hours. **CA Quebec Provincial (Canada, 1/2014).** TWAEV: 20 ppm 8 hours. TWAEV: 97 mg/m³ 8 hours. **CA Saskatchewan Provincial (Canada, 7/2013).** STEL: 30 ppm 15 minutes. TWA: 20 ppm 8 hours.
2-(2-butoxyethoxy)ethanol	**CA Ontario Provincial (Canada, 7/2015).** TWA: 10 ppm 8 hours. Form: Inhalable fraction and vapour.

Occupational exposure limits (Mexico)

Ingredient name	Exposure limits
2-Butoxyethanol	**NOM-010-STPS-2014 (Mexico, 4/2016).** **Absorbed through skin.** TWA: 20 ppm 8 hours.
2-(2-butoxyethoxy)ethanol	**ACGIH TLV (United States, 3/2017).** TWA: 10 ppm 8 hours. Form: Inhalable fraction and vapor

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Section 8. Exposure controls/personal protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.

Color : Not available.

Odor : Not available.

Odor threshold : Not available.

pH : 7.5

Melting point/freezing point : Not available.

Boiling point/boiling range : 100°C (212°F)

Flash point : Closed cup: >93.3°C (>199.9°F)

Evaporation rate : 0.09 (butyl acetate = 1)

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Lower: 0.9%
Upper: 10.6%

Vapor pressure : 2.3 kPa (17.5 mm Hg) [at 20°C]

Vapor density : 1 [Air = 1]

Relative density : 1.26

Solubility : Not available.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Kinematic (40°C (104°F)): >0.205 cm^2/s (>20.5 cSt)

Molecular weight : Not applicable.

Aerosol product

Heat of combustion : 1.761 kJ/g

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Section 10. Stability and reactivity

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
2-Butoxyethanol	LCLo Inhalation Vapor	Guinea pig	>3.1 mg/l	1 hours
	LD50 Dermal	Guinea pig	>2000 mg/kg	-
	LD50 Oral	Rat	1300 mg/kg	-
2-(2-Butoxyethoxy)-ethanol	LD50 Dermal	Rabbit	2700 mg/kg	-
	LD50 Oral	Rat	4500 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Titanium Dioxide	Skin - Mild irritant	Human	-	72 hours 300 Micrograms Intermittent	-
2-Butoxyethanol	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Severe irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	500 milligrams	-
Amorphous Silica	Eyes - Mild irritant	Rabbit	-	24 hours 25 milligrams	-
2-(2-Butoxyethoxy)-ethanol	Eyes - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
	Eyes - Severe irritant	Rabbit	-	20 milligrams	-

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
Titanium Dioxide	-	2B	-
2-Butoxyethanol	-	3	-
Amorphous Silica	-	3	-

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Section 11. Toxicological information

Name	Category	Route of exposure	Target organs
2-Butoxyethanol	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects
2-(2-Butoxyethoxy)-ethanol	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
2-Butoxyethanol	Category 2	Not determined	Not determined
2-(2-Butoxyethoxy)-ethanol	Category 2	Not determined	Not determined

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : May cause damage to organs through prolonged or repeated exposure.

Carcinogenicity : Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Oral	28022.2 mg/kg
Dermal	22885.8 mg/kg
Inhalation (vapors)	256.3 mg/l

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Titanium Dioxide	Acute LC50 >1000000 µg/l Marine water	Fish - Fundulus heteroclitus	96 hours
2-Butoxyethanol	Acute EC50 >1000 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 800000 µg/l Marine water	Crustaceans - Crangon crangon	48 hours
	Acute LC50 1250000 µg/l Marine water	Fish - Menidia beryllina	96 hours
2-(2-Butoxyethoxy)-ethanol	Acute LC50 1300000 µg/l Fresh water	Fish - Lepomis macrochirus	96 hours

Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
2-Butoxyethanol	-	-	Readily
2-(2-Butoxyethoxy)-ethanol	-	-	Readily

Bioaccumulative potential

Not available.

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	IATA	IMDG
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-	-
Transport hazard class(es)	-	-	-	-	-
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.
Additional information	-	-	-	-	-

Special precautions for user : Multi-modal shipping descriptions are provided for informational purposes and do not consider container sizes. The presence of a shipping description for a particular mode of transport (sea, air, etc.), does not indicate that the product is packaged suitably for that mode of transport. All packaging must be reviewed for suitability prior to shipment, and compliance with the applicable regulations is the sole responsibility of the person offering the product for transport. People loading and unloading dangerous goods must be trained on all of the risks deriving from the substances and on all actions in case of emergency situations.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Proper shipping name : Not available.
Ship type : Not available.
Pollution category : Not available.

Section 15. Regulatory information

TSCA 5(a)2 proposed significant new use rules: 5-Chloro-2-methylisothiazolinone

SARA 313

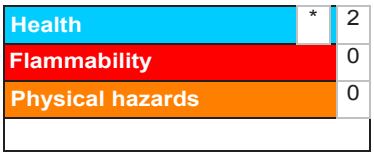
SARA 313 (40 CFR 372.45) supplier notification can be found on the Environmental Data Sheet.

California Prop. 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Section 16. Other information

Hazardous Material Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

Section 16. Other information

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

Procedure used to derive the classification

Classification	Justification
CARCINOGENICITY - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2	Calculation method Calculation method

History

Date of printing : 7/4/2018

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Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Notice to reader

It is recommended that each customer or recipient of this Safety Data Sheet (SDS) study it carefully and consult resources, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. This information is provided in good faith and believed to be accurate as of the effective date herein. However, no warranty, express or implied, is given. The information presented here applies only to the product as shipped. The addition of any material can change the composition, hazards and risks of the product. Products shall not be repackaged, modified, or tinted except as specifically instructed by Sherwin-Williams, including but not limited to the incorporation of non Sherwin-Williams products or the use or addition of products in proportions not specified by Sherwin-Williams. Regulatory requirements are subject to change and may differ between various locations and jurisdictions. The customer/buyer/user is responsible to ensure that his activities comply with all country, federal, state, provincial or local laws. The conditions for use of the product are not under the control of the manufacturer; the customer/buyer/user is responsible to determine the conditions necessary for the safe use of this product. The customer/buyer/user should not use the product for any purpose other than the purpose shown in the applicable section of this SDS without first referring to the supplier and obtaining written handling instructions. Due to the proliferation of sources for information such as manufacturer-specific SDS, the manufacturer cannot be responsible for SDSs obtained from any other source.

Safety Data Sheet

Document Group:	08-9432-9	**Version Number:**	20.05
Issue Date:	10/16/18	**Supercedes Date:**	03/14/18

SECTION 1: Identification

1.1. Product identifier
3M™ Polyurethane Sealant 540 (Various Colors)

Product Identification Numbers
62-5261-5230-1, 62-5261-5235-0, 62-5263-5230-7, 62-5263-5235-6, 62-5484-3530-4, 62-5484-3532-0, 62-5484-3930-6, 62-5484-3937-1, 62-5484-5230-9, 62-5484-5235-8, 62-5484-8530-9, 62-5485-3530-1, 62-5485-3535-0, 62-5485-3537-6, 62-5485-3930-3, 62-5485-3935-2, 62-5485-5230-6, 62-5485-5235-5, 62-5485-8530-6, 62-5485-9530-5, 62-5486-3530-9, 62-5486-3930-1, 62-5486-3937-6, 62-5486-5230-4, 62-5486-5235-3, 62-5486-8530-4, 62-5486-9530-3
7000000941, 7000000942, 7000121518, 7000148278, 7100023084, 7100001804, 7100179707, 7000121517, 7000000940, 7000121514, 7010367932

1.2. Recommended use and restrictions on use

Recommended use
Adhesive, General purpose adhesive sealant

1.3. Supplier's details

MANUFACTURER:	3M
DIVISION:	Industrial Adhesives and Tapes Division
ADDRESS:	3M Center, St. Paul, MN 55144-1000, USA
Telephone:	1-888-3M HELPS (1-888-364-3577)

1.4. Emergency telephone number
1-800-364-3577 or (651) 737-6501 (24 hours)

SECTION 2: Hazard identification

2.1. Hazard classification
Carcinogenicity: Category 2.
Specific Target Organ Toxicity (single exposure): Category 1.
Specific Target Organ Toxicity (repeated exposure): Category 1.

2.2. Label elements
Signal word
Danger

Symbols
Health Hazard |

Pictograms

Hazard Statements
Suspected of causing cancer.

Causes damage to organs:
sensory organs |

Causes damage to organs through prolonged or repeated exposure:
nervous system |

May cause damage to organs through prolonged or repeated exposure:
sensory organs |

Precautionary Statements
General:
Keep out of reach of children.

Prevention:
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust/fume/gas/mist/vapors/spray.
Wear protective gloves.
Do not eat, drink or smoke when using this product.
Wash thoroughly after handling.

Response:
IF exposed or concerned: Get medical advice/attention.

Storage:
Store locked up.

Disposal:
Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

2% of the mixture consists of ingredients of unknown acute dermal toxicity.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
Urethane Polymer	Trade Secret*	15 - 40 Trade Secret *
Poly(Vinyl Chloride) Polymer	9002-86-2	20 - 35 Trade Secret *
Plasticizer	Trade Secret*	10 - 30 Trade Secret *
Calcium Oxide	1305-78-8	1 - 5 Trade Secret *
Titanium Dioxide	13463-67-7	< 5 Trade Secret *
Xylene	1330-20-7	< 5 Trade Secret *

C.I. PIGMENT BLUE 15	Trade Secret*	< 5 Trade Secret *
Iron Oxide (Fe2O3)	1309-37-1	< 5 Trade Secret *
Iron Oxide (Fe3O4)	1317-61-9	< 5 Trade Secret *
Petroleum Distillate	64742-47-8	< 5 Trade Secret *
DIISONONYL PHTHALATE	28553-12-0	< 5 Trade Secret *
Ethylbenzene	100-41-4	< 5 Trade Secret *
Chromium oxide (Cr2O3)	1308-38-9	< 1 Trade Secret *
IRON HYDROXIDE OXIDE	20344-49-4	< 5 Trade Secret *
Carbon Black	1333-86-4	< 1 Trade Secret *
C.I. PIGMENT BLUE 36	68187-11-1	< 1 Trade Secret *
P,P'-Methylenebis(phenyl isocyanate)	101-68-8	< 0.1 Trade Secret *

*The specific chemical identity and/or exact percentage (concentration) of this composition has been withheld as a trade secret.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Remove person to fresh air. If you feel unwell, get medical attention.

Skin Contact:
Wash with soap and water. If signs/symptoms develop, get medical attention.

Eye Contact:
Immediately flush with large amounts of water for at least 15 minutes. Remove contact lenses if easy to do. Continue rinsing. Immediately get medical attention.

If Swallowed:
Rinse mouth. If you feel unwell, get medical attention.

4.2. Most important symptoms and effects, both acute and delayed
See Section 11.1. Information on toxicological effects.

4.3. Indication of any immediate medical attention and special treatment required
Not applicable

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media
In case of fire: Use a carbon dioxide or dry chemical extinguisher to extinguish.

5.2. Special hazards arising from the substance or mixture
None inherent in this product.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Hydrogen Chloride	During Combustion
Hydrogen Cyanide	During Combustion
Oxides of Nitrogen	During Combustion
Oxides of Sulfur	During Combustion

5.3. Special protective actions for fire-fighters
Wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate area. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions
Avoid release to the environment.

6.3. Methods and material for containment and cleaning up
Collect as much of the spilled material as possible. Place in a closed container approved for transportation by appropriate authorities. Clean up residue. Seal the container. Dispose of collected material as soon as possible in accordance with applicable local/regional/national/international regulations.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Keep out of reach of children. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment. Use personal protective equipment (gloves, respirators, etc.) as required.

7.2. Conditions for safe storage including any incompatibilities
Keep container tightly closed to prevent contamination with water or air. If contamination is suspected, do not reseal container. Store away from heat. Store away from amines.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits
If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

Ingredient	C.A.S. No.	Agency	Limit type	Additional Comments
Ethylbenzene	100-41-4	ACGIH	TWA:20 ppm	A3: Confirmed animal carcin.
Ethylbenzene	100-41-4	OSHA	TWA:435 mg/m3(100 ppm)	
P,P'-Methylenebis(phenyl isocyanate)	101-68-8	ACGIH	TWA:0.005 ppm	
P,P'-Methylenebis(phenyl isocyanate)	101-68-8	OSHA	CEIL:0.2 mg/m3(0.02 ppm)	
Calcium Oxide	1305-78-8	ACGIH	TWA:2 mg/m3	
Calcium Oxide	1305-78-8	OSHA	TWA:5 mg/m3	
CHROMIUM (III) COMPOUNDS	1308-38-9	ACGIH	TWA(as Cr(III), inhalable fraction):0.003 mg/m3;TWA(as Cr):0.5	A4: Not class. as human carcin

			mg/m3	
CHROMIUM (III) COMPOUNDS	1308-38-9	OSHA	TWA(as Cr):0.5 mg/m3	
Chromium, insoluble salts	1308-38-9	OSHA	TWA(as Cr):1 mg/m3	
DUST, INERT OR NUISANCE	1309-37-1	OSHA	TWA(as total dust):15 mg/m3;TWA(as total dust):50 millions of particles/cu. ft.(15 mg/m3);TWA(respirable fraction):15 millions of particles/cu. ft.(5 mg/m3);TWA(respirable fraction):5 mg/m3	
Iron Oxide (Fe2O3)	1309-37-1	ACGIH	TWA(respirable fraction):5 mg/m3	A4: Not class. as human carcin
Iron Oxide (Fe2O3)	1309-37-1	OSHA	TWA(as fume):10 mg/m3	
ROUGE	1309-37-1	OSHA	TWA(as total dust):15 mg/m3;TWA(respirable fraction):5 mg/m3	
Xylene	1330-20-7	ACGIH	TWA:100 ppm;STEL:150 ppm	A4: Not class. as human carcin
Xylene	1330-20-7	OSHA	TWA:435 mg/m3(100 ppm)	
Carbon Black	1333-86-4	ACGIH	TWA(inhalable fraction):3 mg/m3	A3: Confirmed animal carcin.
Carbon Black	1333-86-4	OSHA	TWA:3.5 mg/m3	
Titanium Dioxide	13463-67-7	ACGIH	TWA:10 mg/m3	A4: Not class. as human carcin
Titanium Dioxide	13463-67-7	OSHA	TWA(as total dust):15 mg/m3	
Kerosine (petroleum)	64742-47-8	ACGIH	TWA(as total hydrocarbon vapor, non-aerosol):200 mg/m3	A3: Confirmed animal carcin., SKIN
CHROMIUM (III) COMPOUNDS	68187-11-1	ACGIH	TWA(as Cr(III), inhalable fraction):0.003 mg/m3;TWA(as Cr):0.5 mg/m3	A4: Not class. as human carcin
CHROMIUM (III) COMPOUNDS	68187-11-1	OSHA	TWA(as Cr):0.5 mg/m3	
Cobalt, inorganic compounds	68187-11-1	ACGIH	TWA(as Co):0.02 mg/m3	A3: Confirmed animal carcin.
DUST, INERT OR NUISANCE	9002-86-2	OSHA	TWA(as total dust):15 mg/m3;TWA(as total dust):50 millions of particles/cu. ft.(15 mg/m3);TWA(respirable fraction):15 millions of particles/cu. ft.(5 mg/m3);TWA(respirable fraction):5 mg/m3	
Poly(Vinyl Chloride) Polymer	9002-86-2	ACGIH	TWA(respirable fraction):1 mg/m3	A4: Not class. as human carcin
C.I. PIGMENT BLUE 15	Trade Secret	ACGIH	TWA(as Cu dust or mist):1 mg/m3;TWA(as Cu, fume):0.2 mg/m3	

ACGIH : American Conference of Governmental Industrial Hygienists
AIHA : American Industrial Hygiene Association
CMRG : Chemical Manufacturer's Recommended Guidelines
OSHA : United States Department of Labor - Occupational Safety and Health Administration

TWA: Time-Weighted-Average
STEL: Short Term Exposure Limit
CEIL: Ceiling

8.2. Exposure controls

8.2.1. Engineering controls
Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection
None required.

Skin/hand protection
Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing. Note: Nitrile gloves may be worn over polymer laminate gloves to improve dexterity.
Gloves made from the following material(s) are recommended: Polymer laminate

Respiratory protection

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:
Half facepiece or full facepiece air-purifying respirator suitable for organic vapors and particulates

For questions about suitability for a specific application, consult with your respirator manufacturer.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

General Physical Form:	Solid
Specific Physical Form:	Paste
Odor, Color, Grade:	Mild xylene odor
Odor threshold	*No Data Available*
pH	*Not Applicable*
Melting point	*No Data Available*
Boiling Point	>=136 ºC
Flash Point	No flash point
Evaporation rate	*No Data Available*
Flammability (solid, gas)	Not Classified
Flammable Limits(LEL)	*Not Applicable*
Flammable Limits(UEL)	*Not Applicable*
Vapor Pressure	*Not Applicable*
Vapor Density	*Not Applicable*
Density	1.17 g/ml
Specific Gravity	1.17 [*Ref Std:*WATER=1]
Solubility in Water	Nil
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*No Data Available*
Autoignition temperature	>=200 ºC
Decomposition temperature	*No Data Available*

Viscosity	>=300,000 centipoise [@ 73.4 ºF]
Hazardous Air Pollutants	<=7.1 % weight [*Test Method:*Calculated]
Molecular weight	*No Data Available*
VOC Less H2O & Exempt Solvents	54 g/l [*Test Method:*tested per EPA method 24]

SECTION 10: Stability and reactivity

10.1. Reactivity
This material may be reactive with certain agents under certain conditions - see the remaining headings in this section.

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
Hazardous polymerization will not occur.

10.4. Conditions to avoid
Heat

10.5. Incompatible materials
Amines
Alcohols
Water

10.6. Hazardous decomposition products

Substance	**Condition**
None known.	

Refer to section 5.2 for hazardous decomposition products during combustion.

SECTION 11: Toxicological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

11.1. Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation:
Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

May cause additional health effects (see below).

Skin Contact:
Mild Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, and dryness.

Eye Contact:
Contact with the eyes during product use is not expected to result in significant irritation.

Ingestion:
Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

May cause additional health effects (see below).

Additional Health Effects:

Single exposure may cause target organ effects:
Auditory Effects: Signs/symptoms may include hearing impairment, balance dysfunction and ringing in the ears.

Prolonged or repeated exposure may cause target organ effects:
Auditory Effects: Signs/symptoms may include hearing impairment, balance dysfunction and ringing in the ears.

Neurological Effects: Signs/symptoms may include personality changes, lack of coordination, sensory loss, tingling or numbness of the extremities, weakness, tremors, and/or changes in blood pressure and heart rate.

Carcinogenicity:
Contains a chemical or chemicals which can cause cancer.

Ingredient	CAS No.	Class Description	Regulation
Carbon Black	1333-86-4	Grp. 2B: Possible human carc.	International Agency for Research on Cancer
Ethylbenzene	100-41-4	Grp. 2B: Possible human carc.	International Agency for Research on Cancer
Titanium Dioxide	13463-67-7	Grp. 2B: Possible human carc.	International Agency for Research on Cancer

Toxicological Data
If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
Overall product	Dermal		No data available; calculated ATE >5,000 mg/kg
Overall product	Inhalation-Vapor(4 hr)		No data available; calculated ATE >50 mg/l
Overall product	Ingestion		No data available; calculated ATE >5,000 mg/kg
Poly(Vinyl Chloride) Polymer	Dermal		LD50 estimated to be > 5,000 mg/kg
Poly(Vinyl Chloride) Polymer	Ingestion		LD50 estimated to be > 5,000 mg/kg
Plasticizer	Dermal	Rat	LD50 > 1,000 mg/kg
Plasticizer	Ingestion	Rat	LD50 > 5,000 mg/kg
Xylene	Dermal	Rabbit	LD50 > 4,200 mg/kg
Xylene	Inhalation-Vapor (4 hours)	Rat	LC50 29 mg/l
Xylene	Ingestion	Rat	LD50 3,523 mg/kg
Iron Oxide (Fe2O3)	Dermal	Not available	LD50 3,100 mg/kg
Iron Oxide (Fe2O3)	Ingestion	Not available	LD50 3,700 mg/kg
Titanium Dioxide	Dermal	Rabbit	LD50 > 10,000 mg/kg
Titanium Dioxide	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 6.82 mg/l
Titanium Dioxide	Ingestion	Rat	LD50 > 10,000 mg/kg
C.I. PIGMENT BLUE 15	Dermal		LD50 estimated to be > 5,000 mg/kg
Iron Oxide (Fe3O4)	Dermal	Not available	LD50 3,100 mg/kg

Iron Oxide (Fe3O4)	Ingestion	Not available	LD50 3,700 mg/kg
C.I. PIGMENT BLUE 15	Ingestion	Rat	LD50 10,000 mg/kg
Calcium Oxide	Ingestion	Rat	LD50 > 2,500 mg/kg
Petroleum Distillate	Dermal	Rabbit	LD50 > 3,160 mg/kg
Petroleum Distillate	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 3 mg/l
Petroleum Distillate	Ingestion	Rat	LD50 > 5,000 mg/kg
DIISONONYL PHTHALATE	Dermal	Rabbit	LD50 > 3,160 mg/kg
DIISONONYL PHTHALATE	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 1.7 mg/l
DIISONONYL PHTHALATE	Ingestion	Rat	LD50 > 10,000 mg/kg
Ethylbenzene	Dermal	Rabbit	LD50 15,433 mg/kg
Ethylbenzene	Inhalation-Vapor (4 hours)	Rat	LC50 17.4 mg/l
Ethylbenzene	Ingestion	Rat	LD50 4,769 mg/kg
Chromium oxide (Cr2O3)	Dermal	Professional judgement	LD50 estimated to be > 5,000 mg/kg
Chromium oxide (Cr2O3)	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 5.41 mg/l
Chromium oxide (Cr2O3)	Ingestion	Rat	LD50 > 5,000 mg/kg
IRON HYDROXIDE OXIDE	Dermal		LD50 estimated to be > 5,000 mg/kg
IRON HYDROXIDE OXIDE	Ingestion	Rat	LD50 > 10,000 mg/kg
Carbon Black	Dermal	Rabbit	LD50 > 3,000 mg/kg
Carbon Black	Ingestion	Rat	LD50 > 8,000 mg/kg
C.I. PIGMENT BLUE 36	Dermal		LD50 estimated to be > 5,000 mg/kg
C.I. PIGMENT BLUE 36	Ingestion	Rabbit	LD50 > 5,000 mg/kg
P,P'-Methylenebis(phenyl isocyanate)	Dermal	Rabbit	LD50 > 5,000 mg/kg
P,P'-Methylenebis(phenyl isocyanate)	Inhalation-Dust/Mist (4 hours)	Rat	LC50 0.368 mg/l
P,P'-Methylenebis(phenyl isocyanate)	Ingestion	Rat	LD50 31,600 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
Poly(Vinyl Chloride) Polymer	Professional judgement	No significant irritation
Xylene	Rabbit	Mild irritant
Iron Oxide (Fe2O3)	Rabbit	No significant irritation
Titanium Dioxide	Rabbit	No significant irritation
C.I. PIGMENT BLUE 15	Rabbit	No significant irritation
Iron Oxide (Fe3O4)	Rabbit	No significant irritation
Calcium Oxide	Human	Corrosive
Petroleum Distillate	Rabbit	Mild irritant
DIISONONYL PHTHALATE	Rabbit	No significant irritation
Ethylbenzene	Rabbit	Mild irritant
Chromium oxide (Cr2O3)	Rabbit	No significant irritation
IRON HYDROXIDE OXIDE	Rabbit	No significant irritation
Carbon Black	Rabbit	No significant irritation
P,P'-Methylenebis(phenyl isocyanate)	official classification	Irritant

Serious Eye Damage/Irritation

Name	Species	Value
Overall product	Rabbit	Mild irritant
Xylene	Rabbit	Mild irritant
Iron Oxide (Fe2O3)	Rabbit	No significant irritation
Titanium Dioxide	Rabbit	No significant irritation
C.I. PIGMENT BLUE 15	Rabbit	No significant irritation
Iron Oxide (Fe3O4)	Rabbit	No significant irritation
Calcium Oxide	Rabbit	Corrosive
Petroleum Distillate	Rabbit	Mild irritant
DIISONONYL PHTHALATE	Rabbit	Mild irritant
Ethylbenzene	Rabbit	Moderate irritant
Chromium oxide (Cr2O3)	Rabbit	No significant irritation
IRON HYDROXIDE OXIDE	Rabbit	No significant irritation
Carbon Black	Rabbit	No significant irritation
P,P'-Methylenebis(phenyl isocyanate)	official classification	Severe irritant

Skin Sensitization

Name	Species	Value
Iron Oxide (Fe2O3)	Human	Not classified
Titanium Dioxide	Human and animal	Not classified
C.I. PIGMENT BLUE 15	Human	Not classified
Iron Oxide (Fe3O4)	Human	Not classified
Petroleum Distillate	Guinea pig	Not classified
DIISONONYL PHTHALATE	Human and animal	Not classified
Ethylbenzene	Human	Not classified
Chromium oxide (Cr2O3)	similar compounds	Not classified
IRON HYDROXIDE OXIDE	Human and animal	Not classified
P,P'-Methylenebis(phenyl isocyanate)	official classification	Sensitizing

Respiratory Sensitization

Name	Species	Value
P,P'-Methylenebis(phenyl isocyanate)	Human	Sensitizing

Germ Cell Mutagenicity

Name	Route	Value
Poly(Vinyl Chloride) Polymer	In Vitro	Not mutagenic
Xylene	In Vitro	Not mutagenic
Xylene	In vivo	Not mutagenic
Iron Oxide (Fe2O3)	In Vitro	Not mutagenic
Titanium Dioxide	In Vitro	Not mutagenic
Titanium Dioxide	In vivo	Not mutagenic
C.I. PIGMENT BLUE 15	In Vitro	Not mutagenic
Iron Oxide (Fe3O4)	In Vitro	Not mutagenic
Calcium Oxide	In Vitro	Not mutagenic
Petroleum Distillate	In Vitro	Not mutagenic
DIISONONYL PHTHALATE	In Vitro	Not mutagenic
Ethylbenzene	In vivo	Not mutagenic

Ethylbenzene	In Vitro	Some positive data exist, but the data are not sufficient for classification
Chromium oxide (Cr2O3)	In vivo	Not mutagenic
Chromium oxide (Cr2O3)	In Vitro	Some positive data exist, but the data are not sufficient for classification
Carbon Black	In Vitro	Not mutagenic
Carbon Black	In vivo	Some positive data exist, but the data are not sufficient for classification
P,P'-Methylenebis(phenyl isocyanate)	In Vitro	Some positive data exist, but the data are not sufficient for classification

Carcinogenicity

Name	Route	Species	Value
Poly(Vinyl Chloride) Polymer	Not Specified	Rat	Some positive data exist, but the data are not sufficient for classification
Xylene	Dermal	Rat	Not carcinogenic
Xylene	Ingestion	Multiple animal species	Not carcinogenic
Xylene	Inhalation	Human	Some positive data exist, but the data are not sufficient for classification
Iron Oxide (Fe2O3)	Inhalation	Human	Some positive data exist, but the data are not sufficient for classification
Titanium Dioxide	Ingestion	Multiple animal species	Not carcinogenic
Titanium Dioxide	Inhalation	Rat	Carcinogenic
C.I. PIGMENT BLUE 15	Ingestion	Mouse	Not carcinogenic
Iron Oxide (Fe3O4)	Inhalation	Human	Some positive data exist, but the data are not sufficient for classification
Petroleum Distillate	Dermal	Mouse	Some positive data exist, but the data are not sufficient for classification
DIISONONYL PHTHALATE	Ingestion	Multiple animal species	Some positive data exist, but the data are not sufficient for classification
Ethylbenzene	Inhalation	Multiple animal species	Carcinogenic
Chromium oxide (Cr2O3)	Ingestion	Rat	Not carcinogenic
IRON HYDROXIDE OXIDE	Inhalation	Rat	Not carcinogenic
Carbon Black	Dermal	Mouse	Not carcinogenic
Carbon Black	Ingestion	Mouse	Not carcinogenic
Carbon Black	Inhalation	Rat	Carcinogenic
P,P'-Methylenebis(phenyl isocyanate)	Inhalation	Rat	Some positive data exist, but the data are not sufficient for classification

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test Result	Exposure Duration
Poly(Vinyl Chloride) Polymer	Not Specified	Not classified for development	Mouse	NOAEL Not available	during gestation
Xylene	Inhalation	Not classified for female reproduction	Human	NOAEL Not available	occupational exposure
Xylene	Ingestion	Not classified for development	Mouse	NOAEL Not available	during organogenesis
Xylene	Inhalation	Not classified for development	Multiple animal species	NOAEL Not available	during gestation
C.I. PIGMENT BLUE 15	Ingestion	Not classified for female reproduction	Rat	NOAEL 1,000 mg/kg/day	premating into lactation
C.I. PIGMENT BLUE 15	Ingestion	Not classified for male reproduction	Rat	NOAEL 1,000 mg/kg/day	42 days

C.I. PIGMENT BLUE 15	Ingestion	Not classified for development	Rat	NOAEL 1,000 mg/kg/day	premating into lactation
DIISONONYL PHTHALATE	Ingestion	Not classified for female reproduction	Rat	NOAEL 500 mg/kg/day	2 generation
DIISONONYL PHTHALATE	Ingestion	Not classified for male reproduction	Rat	NOAEL 500 mg/kg/day	2 generation
DIISONONYL PHTHALATE	Ingestion	Not classified for development	Rat	NOAEL 1,000 mg/kg/day	during organogenesis
Ethylbenzene	Inhalation	Not classified for development	Rat	NOAEL 4.3 mg/l	premating & during gestation
Chromium oxide (Cr2O3)	Ingestion	Not classified for female reproduction	Rat	NOAEL 2,000 mg/kg/day	90 days
Chromium oxide (Cr2O3)	Ingestion	Not classified for male reproduction	Rat	NOAEL 2,000 mg/kg/day	90 days
Chromium oxide (Cr2O3)	Ingestion	Not classified for development	Rat	NOAEL 2,000 mg/kg/day	90 days
P,P'-Methylenebis(phenyl isocyanate)	Inhalation	Not classified for development	Rat	NOAEL 0.004 mg/l	during organogenesis

Lactation

Name	Route	Species	Value
Xylene	Ingestion	Mouse	Not classified for effects on or via lactation

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Xylene	Inhalation	auditory system	Causes damage to organs	Rat	LOAEL 6.3 mg/l	8 hours
Xylene	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	
Xylene	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	
Xylene	Inhalation	eyes	Not classified	Rat	NOAEL 3.5 mg/l	not available
Xylene	Inhalation	liver	Not classified	Multiple animal species	NOAEL Not available	
Xylene	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Multiple animal species	NOAEL Not available	
Xylene	Ingestion	eyes	Not classified	Rat	NOAEL 250 mg/kg	not applicable
Calcium Oxide	Inhalation	respiratory irritation	May cause respiratory irritation	Not available	NOAEL Not available	occupational exposure
Petroleum Distillate	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human and animal	NOAEL Not available	
Petroleum Distillate	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification		NOAEL Not available	
Petroleum Distillate	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Professional judgement	NOAEL Notavailable	
Ethylbenzene	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	
Ethylbenzene	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for	Human and	NOAEL Not available	

			classification	animal		
Ethylbenzene	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Professional judgement	NOAEL Not available	
Chromium oxide (Cr2O3)	Inhalation	respiratory system	Not classified	Rat	NOAEL 40 mg	
P,P'-Methylenebis(phenyl isocyanate)	Inhalation	respiratory irritation	May cause respiratory irritation	official classification	NOAEL Not available	

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Poly(Vinyl Chloride) Polymer	Inhalation	respiratory system	Not classified	Multiple animal species	NOAEL 0.013 mg/l	22 months
Xylene	Inhalation	nervous system	Causes damage to organs through prolonged or repeated exposure	Rat	LOAEL 0.4 mg/l	4 weeks
Xylene	Inhalation	auditory system	May cause damage to organs though prolonged or repeated exposure	Rat	LOAEL 7.8 mg/l	5 days
Xylene	Inhalation	liver	Not classified	Multiple animal species	NOAEL Not available	
Xylene	Inhalation	heart | endocrine system | gastrointestinal tract | hematopoietic system | muscles | kidney and/or bladder | respiratory system	Not classified	Multiple animal species	NOAEL 3.5 mg/l	13 weeks
Xylene	Ingestion	auditory system	Not classified	Rat	NOAEL 900 mg/kg/day	2 weeks
Xylene	Ingestion	kidney and/or bladder	Not classified	Rat	NOAEL 1,500 mg/kg/day	90 days
Xylene	Ingestion	liver	Not classified	Multiple animal species	NOAEL Not available	
Xylene	Ingestion	heart | skin | endocrine system | bone, teeth, nails, and/or hair | hematopoietic system | immune system | nervous system | respiratory system	Not classified	Mouse	NOAEL 1,000 mg/kg/day	103 weeks
Iron Oxide (Fe2O3)	Inhalation	pulmonary fibrosis | pneumoconiosis	Not classified	Human	NOAEL Not available	occupational exposure
Titanium Dioxide	Inhalation	respiratory system	Some positive data exist, but the data are not sufficient for classification	Rat	LOAEL 0.01 mg/l	2 years
Titanium Dioxide	Inhalation	pulmonary fibrosis	Not classified	Human	NOAEL Not available	occupational exposure
C.I. PIGMENT BLUE 15	Ingestion	endocrine system | hematopoietic system | respiratory system	Not classified	Rat	NOAEL 1,000 mg/kg/day	28 days
C.I. PIGMENT BLUE 15	Ingestion	kidney and/or bladder	Not classified	Multiple animal species	NOAEL Not available	not available
Iron Oxide (Fe3O4)	Inhalation	pulmonary fibrosis | pneumoconiosis	Not classified	Human	NOAEL Not available	occupational exposure
DIISONONYL	Dermal	blood | liver | kidney	Not classified	Rabbit	NOAEL	6 weeks

PHTHALATE		and/or bladder			2,425 mg/kg/day	
DIISONONYL PHTHALATE	Ingestion	kidney and/or bladder	Not classified	Rat	NOAEL not available	13 weeks
Ethylbenzene	Inhalation	kidney and/or bladder	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 1.1 mg/l	2 years
Ethylbenzene	Inhalation	liver	Some positive data exist, but the data are not sufficient for classification	Mouse	NOAEL 1.1 mg/l	103 weeks
Ethylbenzene	Inhalation	hematopoietic system	Not classified	Rat	NOAEL 3.4 mg/l	28 days
Ethylbenzene	Inhalation	auditory system	Not classified	Rat	NOAEL 2.4 mg/l	5 days
Ethylbenzene	Inhalation	endocrine system	Not classified	Mouse	NOAEL 3.3 mg/l	103 weeks
Ethylbenzene	Inhalation	gastrointestinal tract	Not classified	Rat	NOAEL 3.3 mg/l	2 years
Ethylbenzene	Inhalation	bone, teeth, nails, and/or hair | muscles	Not classified	Multiple animal species	NOAEL 4.2 mg/l	90 days
Ethylbenzene	Inhalation	heart | immune system | respiratory system	Not classified	Multiple animal species	NOAEL 3.3 mg/l	2 years
Ethylbenzene	Ingestion	liver | kidney and/or bladder	Not classified	Rat	NOAEL 680 mg/kg/day	6 months
Chromium oxide (Cr2O3)	Inhalation	immune system | respiratory system | hematopoietic system | liver | kidney and/or bladder	Not classified	Rat	NOAEL 44 mg/m3	90 days
IRON HYDROXIDE OXIDE	Inhalation	respiratory system | liver | kidney and/or bladder	Not classified	Rat	NOAEL 0.2 mg/l	14 days
Carbon Black	Inhalation	pneumoconiosis	Not classified	Human	NOAEL Not available	occupational exposure
P,P'-Methylenebis(phenyl isocyanate)	Inhalation	respiratory system	Causes damage to organs through prolonged or repeated exposure	Rat	LOAEL 0.004 mg/l	13 weeks

Aspiration Hazard

Name	Value
Xylene	Aspiration hazard
Petroleum Distillate	Aspiration hazard
Ethylbenzene	Aspiration hazard

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information

Ecotoxicological information

Please contact the address or phone number listed on the first page of the SDS for additional ecotoxicological information on this material and/or its components.

Chemical fate information

Please contact the address or phone number listed on the first page of the SDS for additional chemical fate information on this material and/or its components.

SECTION 13: Disposal considerations

13.1. Disposal methods
Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Dispose of completely cured (or polymerized) material in a permitted industrial waste facility. As a disposal alternative, incinerate uncured product in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Combustion products will include halogen acid (HCl/HF/HBr). Facility must be capable of handling halogenated materials. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

SECTION 14: Transport Information

For Transport Information, please visit http://3M.com/Transportinfo or call 1-800-364-3577 or 651-737-6501.

SECTION 15: Regulatory information

15.1. US Federal Regulations
Contact manufacturer for more information

EPCRA 311/312 Hazard Classifications:

Physical Hazards
Not applicable

Health Hazards
Carcinogenicity
Specific target organ toxicity (single or repeated exposure)

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

Ingredient	C.A.S. No	% by Wt
Xylene	1330-20-7	Trade Secret < 5
Xylene (Benzene, dimethyl-)	1330-20-7	< 5
Ethylbenzene	100-41-4	Trade Secret < 5
C.I. PIGMENT BLUE 36 (Cobalt, inorganic compounds)	68187-11-1	< 1

15.2. State Regulations
Contact manufacturer for more information
California Proposition 65

Ingredient	C.A.S. No.	Listing
DIISONONYL PHTHALATE; 1,2-BENZENEDICARBOXYLIC ACID, DIISONONYL ESTER (DINP)	None	Carcinogen
TOLUENE	108-88-3	Developmental Toxin
ETHYLBENZENE	100-41-4	Carcinogen
CARBON BLACK (AIRBORNE, UNBOUND PARTICLES OF RESPIRABLE SIZE [<= 10 MICROMETERS])	1333-86-4	Carcinogen
TITANIUM DIOXIDE (AIRBORNE, UNBOUND PARTICLES OF RESPIRABLE SIZE)	13463-67-7	Carcinogen

15.3. Chemical Inventories
The components of this product are in compliance with the new substance notification requirements of CEPA.

The components of this product are in compliance with the chemical notification requirements of TSCA.

Contact manufacturer for more information

15.4. International Regulations
Contact manufacturer for more information

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: Other information

NFPA Hazard Classification
Health: 1 **Flammability:** 1 **Instability:** 0 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

Document Group:	08-9432-9	**Version Number:**	20.05
Issue Date:	10/16/18	**Supercedes Date:**	03/14/18

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3M USA SDSs are available at www.3M.com

Safety Data Sheet

Sikaflex® Crack Flex Sealant

Revision Date 09/18/2017 Print Date 01/31/2018

1. Identification

Product name	:	Sikaflex® Crack Flex Sealant
Supplier	:	Sika Corporation 201 Polito Avenue Lyndhurst, NJ 07071 USA www.sikausa.com
Telephone	:	(201) 933-8800
Telefax	:	(201) 804-1076
E-mail address	:	ehs@sika-corp.com
Emergency telephone	:	CHEMTREC: 800-424-9300 INTERNATIONAL: 703-527-3887
Recommended use of the chemical and restrictions on use	:	For further information, refer to product data sheet.

2. Hazards identification

GHS Classification

Flammable liquids, Category 4	H227: Combustible liquid.
Respiratory sensitization, Category 1	H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitization, Category 1	H317: May cause an allergic skin reaction.
Carcinogenicity, Category 1A (Inhalation)	H350i: May cause cancer by inhalation.
Specific target organ systemic toxicity - repeated exposure, Category 2, hearing organs (Inhalation)	H373: May cause damage to organs through prolonged or repeated exposure if inhaled.

GHS label elements

Hazard pictograms :

Signal Word : Danger

Hazard Statements : H227 Combustible liquid.
H317 May cause an allergic skin reaction.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H350i May cause cancer by inhalation.
H373 May cause damage to organs (hearing organs) through prolonged or repeated exposure if inhaled.

Safety Data Sheet

Sikaflex® Crack Flex Sealant

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Precautionary Statements	:	**Prevention:** P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking. P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray. P272 Contaminated work clothing must not be allowed out of the workplace. P280 Wear protective gloves. P281 Use personal protective equipment as required. P285 In case of inadequate ventilation wear respiratory protection. **Response:** P302 + P352 IF ON SKIN: Wash with plenty of soap and water. P304 + P341 IF INHALED: If breathing is difficult, remove person to fresh air and keep comfortable for breathing. P308 + P313 IF exposed or concerned: Get medical advice/ attention. P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention. P363 Wash contaminated clothing before reuse. P370 + P378 In case of fire: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment for extinction. **Storage:** P403 + P235 Store in a well-ventilated place. Keep cool. P405 Store locked up. **Disposal:** P501 Dispose of contents/ container to an approved waste disposal plant.
Warning	:	Reports have associated repeated and prolonged exposure to some of the chemicals in this product with permanent brain,liver, kidney and nervous system damage. Intentional misuse by deliberate concentration and inhalation of vapors may be harmful or fatal.

See Section 11 for more detailed information on health effects and symptoms.
There are no hazards not otherwise classified that have been identified during the classification process.
There are no ingredients with unknown acute toxicity used in a mixture at a concentration >= 1%.

3. Composition/information on ingredients

Hazardous ingredients

Chemical name	CAS-No.	Concentration (%)
Calcium oxide	1305-78-8	>= 3 - < 5 %
xylene	1330-20-7	>= 2 - < 5 %
Isophoronedialdimine	932742-30-8	>= 1 - < 2 %
ethylbenzene	100-41-4	>= 0.1 - < 1 %
3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate	4098-71-9	>= 0.1 - < 1 %

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4,4'-methylenediphenyl diisocyanate	101-68-8	>= 0.1 - < 1 %
Aliphatic polyisocyanate	28182-81-2	>= 0.1 - < 1 %
Quartz (SiO2) <5µm	14808-60-7	>= 0.1 - < 1 %
4,4'-Methylenediphenyl diisocyanate, oligomers	25686-28-6	>= 0.1 - < 1 %

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

If inhaled : Move to fresh air.
Consult a physician after significant exposure.

In case of skin contact : Take off contaminated clothing and shoes immediately.
Wash off with soap and plenty of water.
If symptoms persist, call a physician.

In case of eye contact : Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Clean mouth with water and drink afterwards plenty of water.
Do not induce vomiting without medical advice.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
Obtain medical attention.

Most important symptoms and effects, both acute and delayed : sensitizing effects
carcinogenic effects

Asthmatic appearance
Allergic reactions
See Section 11 for more detailed information on health effects and symptoms.

May cause an allergic skin reaction.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause cancer by inhalation.
May cause damage to organs through prolonged or repeated exposure if inhaled.

Protection of first-aiders : Move out of dangerous area.
Consult a physician.
Show this material safety data sheet to the doctor in attendance.

Notes to physician : Treat symptomatically.

5. Fire-fighting measures

Suitable extinguishing media : Carbon dioxide (CO2)

Unsuitable extinguishing media	:	Water
Specific extinguishing methods	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for fire-fighters	:	In the event of fire, wear self-contained breathing apparatus.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Deny access to unprotected persons.
Environmental precautions	:	Do not flush into surface water or sanitary sewer system. If the product contaminates rivers and lakes or drains inform respective authorities. Local authorities should be advised if significant spillages cannot be contained.
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

7. Handling and storage

Advice on safe handling	:	Avoid formation of aerosol. Do not breathe vapors or spray mist. Avoid exceeding the given occupational exposure limits (see section 8). Do not get in eyes, on skin, or on clothing. For personal protection see section 8. Persons with a history of skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used. Smoking, eating and drinking should be prohibited in the application area. Follow standard hygiene measures when handling chemical products.
Conditions for safe storage	:	Prevent unauthorized access. Store in original container. Keep in a well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Store in accordance with local regulations.
Materials to avoid	:	No data available

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8. Exposure controls/personal protection

Component	CAS-No.	Basis **	Value	Exposure limit(s)* / Form of exposure
Calcium oxide	1305-78-8	ACGIH	TWA	2 mg/m3
		OSHA Z-1	TWA	5 mg/m3
		OSHA P0	TWA	5 mg/m3
xylene	1330-20-7	OSHA Z-1	TWA	100 ppm 435 mg/m3
		OSHA P0	STEL	150 ppm 655 mg/m3
		OSHA P0	TWA	100 ppm 435 mg/m3
		ACGIH	TWA	100 ppm
		ACGIH	STEL	150 ppm
ethylbenzene	100-41-4	ACGIH	TWA	20 ppm
		ACGIH	STEL	125 ppm
		OSHA Z-1	TWA	100 ppm 435 mg/m3
		OSHA P0	TWA	100 ppm 435 mg/m3
		OSHA P0	STEL	125 ppm 545 mg/m3
3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate	4098-71-9	ACGIH	TWA	0.005 ppm
		OSHA P0	TWA	0.005 ppm
		OSHA P0	STEL	0.02 ppm
4,4'-methylenediphenyl diisocyanate	101-68-8	ACGIH	TWA	0.005 ppm
		OSHA Z-1	C	0.02 ppm 0.2 mg/m3
		OSHA P0	C	0.02 ppm

				0.2 mg/m3
Quartz (SiO2) <5µm	14808-60-7	OSHA Z-3	TWA	10 mg/m3 / %SiO2+2 respirable
		OSHA Z-3	TWA	250 mppcf / %SiO2+5 respirable
		OSHA P0	TWA	0.1 mg/m3 Respirable fraction
		ACGIH	TWA	0.025 mg/m3 Respirable fraction
		OSHA Z-1	TWA	0.05 mg/m3 Respirable dust

*The above mentioned values are in accordance with the legislation in effect at the date of the release of this safety data sheet.

****Basis**
ACGIH. Threshold Limit Values (TLV)
OSHA P0. Table Z-1, Limit for Air Contaminat (1989 Vacated Values)
OSHA P1. Permissible Exposure Limits (PEL), Table Z-1, Limit for Air Contaminant
OSHA P2. Permissible Exposure Limits (PEL), Table Z-2
OSHA Z3. Table Z-3, Mineral Dust

Engineering measures : Use of adequate ventilation should be sufficient to control worker exposure to airborne contaminants. If the use of this product generates dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.
The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits.

Personal protective equipment

Respiratory protection : Use a properly fitted NIOSH approved air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.

The filter class for the respirator must be suitable for the maximum expected contaminant concentration (gas/vapor/aerosol/particulates) that may arise when handling the product. If this concentration is exceeded, self-contained breathing apparatus must be used.

Hand protection
Remarks : Chemical-resistant, impervious gloves complying with an

		approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Eye protection	:	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary.
Skin and body protection	:	Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.
Hygiene measures	:	Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Remove respiratory and skin/eye protection only after vapors have been cleared from the area. Remove contaminated clothing and protective equipment before entering eating areas. Wash thoroughly after handling.

9. Physical and chemical properties

Appearance	:	viscous
Color	:	light gray
Odor	:	aromatic
Odor Threshold	:	No data available
Flash point	:	185 °F (85 °C)
Ignition temperature	:	No data available
Decomposition temperature	:	No data available
Lower explosion limit (Vol%)	:	No data available
Upper explosion limit (Vol%)	:	No data available
Flammability (solid, gas)	:	No data available
Oxidizing properties	:	No data available
pH	:	No data available
Melting point/range / Freezing point	:	No data available
Boiling point/boiling range	:	No data available
Vapor pressure	:	0.01 mmHg (0.01 hpa)
Density	:	1.25 g/cm3 at 73 °F (23 °C)

Water solubility	:	Note: insoluble
Partition coefficient: n-octanol/water	:	No data available
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	> 20.5 mm2/s at 104 °F (40 °C)
Relative vapor density	:	No data available
Evaporation rate	:	No data available
Burning rate	:	No data available
Volatile organic compounds (VOC) content	:	30 g/l

10. Stability and reactivity

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	The product is chemically stable.
Possibility of hazardous reactions	:	Stable under recommended storage conditions.
Conditions to avoid	:	Extremes of temperature and direct sunlight.
Incompatible materials	:	No data available

11. Toxicological information

Acute toxicity

Not classified based on available information.

Ingredients:

xylene:

Acute oral toxicity	:	LD50 Oral (Rat): 3,523 mg/kg
Acute dermal toxicity	:	LD50 Dermal (Rabbit): 1,700 mg/kg

Isophoronedialdimine:

Acute oral toxicity	:	LD50 Oral (Rat): > 2,000 mg/kg
Acute dermal toxicity	:	LD50 Dermal (Rabbit): > 2,000 mg/kg

ethylbenzene:

Acute oral toxicity	:	LD50 Oral (Rat): 3,500 mg/kg
Acute dermal toxicity	:	LD50 Dermal (Rabbit): 5,510 mg/kg

3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate:

Acute oral toxicity	:	LD50 Oral (Rat): 4,814 mg/kg

Acute inhalation toxicity	:	LC50 (Rat): 0.031 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 Dermal (Rat): > 7,000 mg/kg

4,4'-methylenediphenyl diisocyanate:

Acute inhalation toxicity	:	Acute toxicity estimate: 1.5 mg/l Test atmosphere: dust/mist Method: Expert judgment

Aliphatic polyisocyanate:

Acute oral toxicity	:	LD50 Oral (Rat): > 2,500 mg/kg
Acute inhalation toxicity	:	Acute toxicity estimate: 1.5 mg/l Test atmosphere: dust/mist Method: Expert judgment
Acute dermal toxicity	:	LD50 Dermal (Rat): > 2,000 mg/kg

4,4'-Methylenediphenyl diisocyanate, oligomers:

Acute oral toxicity	:	LD50 Oral (Rat): > 5,000 mg/kg
Acute inhalation toxicity	:	Acute toxicity estimate: 1.5 mg/l Test atmosphere: dust/mist Method: Expert judgment
Acute dermal toxicity	:	LD50 Dermal (Rabbit): > 9,400 mg/kg

Skin corrosion/irritation

Not classified based on available information.

Serious eye damage/eye irritation

Not classified based on available information.

Product:

Method: OECD Test Guideline 438

Result: No eye irritation
Method: OECD Test Guideline 405

Respiratory or skin sensitization

Skin sensitization: May cause an allergic skin reaction.
Respiratory sensitization: May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Germ cell mutagenicity

Not classified based on available information.

Reproductive toxicity

Not classified based on available information.

STOT-single exposure

Not classified based on available information.

STOT-repeated exposure

May cause damage to organs (hearing organs) through prolonged or repeated exposure if inhaled.
Reports have associated repeated and prolonged exposure to some of the chemicals in this product with permanent brain,liver, kidney and nervous system damage. Intentional misuse by deliberate concentration and inhalation of vapors may be harmful or fatal.
Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Aspiration toxicity

Not classified based on available information.

Carcinogenicity

May cause cancer by inhalation.

IARC	Group 1: Carcinogenic to humans	
	Quartz (SiO2) <5µm	14808-60-7
	Group 2B: Possibly carcinogenic to humans	
	titanium dioxide	13463-67-7
	Carbon black	1333-86-4
	ethylbenzene	100-41-4
NTP	Known to be human carcinogen	
	Quartz (SiO2) <5µm	14808-60-7

Carbon black (1333-86-4)

Animal Toxicity:
Rat, oral, duration 2 year
Effect: no tumors

Mouse, oral, duration 2 years
Effect: no tumors

Mouse, dermal, duration 18 months
Effect: no skin tumors

Rat, inhalation, duration 2 years
Target organ: lungs
Effect: inflammation, fibrosis, tumors

Note: Tumors in the rat lung are considered to be related to the "particle overload phenomenon" rather than to a specific chemical effect of carbon black itself in the lung. These effects in rats have been reported in many studies on other poorly soluble inorganic particles and appear to be rat specific. Tumors have not been observed in other species (i.e., mouse and hamster) for carbon black or other poorly soluble particles under similar circumstances and study conditions.

Mortality studies (human data): A study on carbon black production workers in the UK (Sorahan, 2001) found an increased risk of lung cancer in two of the five plant studied; however, the increase was not related to the dose of carbon black. Thus, the authors did not consider the increased risk in lung cancer to be due to carbon black exposure. A German study of carbon black workers at one plant (Morfeld, 2006; Buechte, 2006) found a similar increase in lung cancer risk but, like the Sorohan, 2001 (UK study) found no association with carbon black exposure. A large US study of 18 plants showed a reduction in lung cancer risk in carbon black production workers (DEll, 2006). Based upon these studies, the February 2006 Working Group at the International Agency for Research on Cancer (IARC) concluded that the human evidence

for carcinogenicity was inadequate (IARC, 2010).

Since the IARC evaluation of carbon black, Sorahan and Harrington (2007) have re-analyzed the UK study data using an alternative exposure hypothesis and found a positive association with carbon black exposure in two of the five plants. The same exposure hypothesis was applied by Morfeld and McCunney (2009) to the German cohort; in contrast, they found no association between carbon black exposure and lung cancer risk and, thus, no support for the alternative exposure hypothesis used by Sorahan and Harrington.

Overall, as a result of these detailed investigations, no causative link between carbon black exposure and cancer risk in humans has been demonstrated.

IARC CANCER CLASSIFICATION: In 2006 IARC re-affirmed its 1995 finding that there is "inadequate evidence" from human health studies to assess whether carbon black causes cancer in humans. IARC concluded that there is "sufficient evidence" in experimental animal studies for the carcinogenicity of carbon black. IARC's overall evaluation is that carbon black is "possibly carcinogenic to humans" (Group 2B)". This conclusion was based on IARC's guidelines, which generally require such a classification if one species exhibits carcinogenicity in two or more animal studies (IARC, 2010).

Solvent extracts of carbon black were used in one study of rats in which skin tumors were found after dermal application and several studies of mice in which sarcomas were found following subcutaneous injection. IARC concluded that there was "sufficient evidence" that carbon black extracts can cause cancer in animals (Group 2B).

ICGIH CANCER CLASSIFICATION: Confirmed Animal Carcinogen with Unknown Relevance to Humans (Category A3 Carcinogen).

ASSESSMENT: Applying the guidelines of self-classification under the Globally Harmonized System of Classification and Labeling of Chemicals, carbon black is not classified as a carcinogen. Lung tumors are induced in rats as a result of repeated exposure to inert, poorly soluble particles like carbon black and other poorly soluble particles. Rats tumors are a result of a secondary non-genotoxic mechanism that has questionable relevance for classification in humans. In support of this opinion, the CLP Guidance for Specific Target Organ Toxicity - Repeated Exposure (STOT-RE), cites lung overload under mechanisms not relevant to humans. Human health studies show that exposure to carbon black does not increase the risk to carcinogenicity.

Titanium dioxide (13463-67-7)

In lifetime inhalation studies of rats, airborne respirable-size titanium dioxide particles have seen shown to cause an increase in lung tumors at concentrations associated with substantial particle lung burdens and consequential pulmonary overload and inflammation. The potential for these adverse health effects appears to be closely related to the particle size and the amount of the exposed surface area that comes into contact with the lung. However, tests with other laboratory aninals such as mice and hamsters, indicate that rats are significantly more susceptible to the pulmonary overload and inflammation that cause lung cancer. Epidemiology studies do no suggest an increased risk of cancer in humans from occupational exposure to titanium dioxide. Titanium dioxide has been characterized by IARC as possibly carcinogenic to humans (Group 2B) through inhalation (not ingestion). It has not been characterized as a potential carcinogen by either NTP or OSHA.

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12. Ecological information

Other information: Do not empty into drains; dispose of this material and its container in a safe way.
Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Component:

xylene	1330-20-7	Toxicity to fish: Species: Oncorhynchus mykiss (rainbow trout) Dose: 3.3 mg/l Exposure time: 96 h
Isophoronedialdimine	932742-30-8	Toxicity to fish: LC50 Species: Fish Dose: 87.2 mg/l Exposure time: 96 h Toxicity to daphnia and other aquatic invertebrates: EC50 Species: Daphnia Dose: > 100 mg/l Exposure time: 48 h Toxicity to algae: EC50 Species: Desmodesmus subspicatus (green algae) Dose: 180.4 mg/l Exposure time: 72 h

13. Disposal considerations

Disposal methods

Waste from residues : Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT
Not dangerous goods
IATA
Not dangerous goods
IMDG
Not dangerous goods

Special precautions for user
No data available

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable

15. Regulatory information

TSCA list : All chemical substances in this product are either listed on the TSCA Inventory or are in compliance with a TSCA Inventory exemption.

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity
This material does not contain any components with a CERCLA RQ.

SARA304 Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Flammable (gases, aerosols, liquids, or solids)
Chronic Health Hazard
Respiratory or skin sensitization
Carcinogenicity
Specific target organ toxicity (single or repeated exposure)

SARA 302 : This material does not contain any components with a section 302 EHS TPQ.

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

xylene	1330-20-7	2.06 %
ethylbenzene	100-41-4	0.51 %

Clean Air Act

Ozone-Depletion Potential This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):

xylene	1330-20-7	2.06 %

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

California Prop 65 ⚠ **WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov

16. Other information

HMIS Classification

Health	*	3
Flammability		2
Physical Hazard		0
Personal Protection		X

Caution: HMIS® rating is based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® rating is not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® rating is to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). Please note HMIS® attempts to convey full health warning information to all employees.

Notes to Reader

The information contained in this Safety Data Sheet applies only to the actual Sika Corporation ("Sika") product identified and described herein. This information is not intended to address, nor does it address the use or application of the identified Sika product in combination with any other material, product or process. All of the information set forth herein is based on technical data regarding the identified product that Sika believes to be reliable as of the date hereof. Prior to each use of any Sika product, the user must always read and follow the warnings and instructions on the product's current Product Data Sheet, product label and Safety Data Sheet for each Sika product, which are available at web site and/or telephone number listed in Section 1 of this SDS.

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Revision Date 09/18/2017

Material number: 427706

Version: 1.1
Revision Date: 07/21/2018

SAFETY DATA SHEET

1. Identification

Material name: TREMFIX A.F. 5 US GL
Material: 350715 805

Recommended use and restriction on use

Recommended use: Coatings
Restrictions on use: Not known.

Manufacturer/Importer/Supplier/Distributor Information
Tremco U.S. Roofing
3735 Green Road
Beachwood OH 44122
US

Contact person:	EH&S Department
Telephone:	216-292-5000
Emergency telephone number:	1-800-424-9300 (US); 1-613-996-6666 (Canada)

2. Hazard(s) identification

Hazard Classification

Health Hazards

Skin sensitizer	Category 1
Germ Cell Mutagenicity	Category 1B
Carcinogenicity	Category 1A
Toxic to reproduction	Category 1B

Unknown toxicity - Health

Acute toxicity, oral	18.96 %
Acute toxicity, dermal	18.97 %
Acute toxicity, inhalation, vapor	100 %
Acute toxicity, inhalation, dust or mist	100 %

Environmental Hazards

Acute hazards to the aquatic environment	Category 1

Unknown toxicity - Environment

Acute hazards to the aquatic environment	94.5 %
Chronic hazards to the aquatic environment	100 %

Label Elements

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Hazard Symbol:

Signal Word: Danger

Hazard Statement:
May cause an allergic skin reaction.
May cause genetic defects.
May cause cancer.
May damage fertility or the unborn child.
Very toxic to aquatic life.

Precautionary Statements

Prevention: Avoid breathing dust/fume/gas/mist/vapors/spray. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves/protective clothing/eye protection/face protection. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Avoid release to the environment.

Response: IF ON SKIN: Wash with plenty of water/… If skin irritation or rash occurs: Get medical advice/attention. IF exposed or concerned: Get medical advice/attention. Specific treatment (see on this label). Wash contaminated clothing before reuse. Collect spillage.

Storage: Store locked up.

Disposal: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Hazard(s) not otherwise classified (HNOC): None.

3. Composition/information on ingredients

Mixtures

Chemical Identity	CAS number	Content in percent (%)*

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Coal tar pitch	65996-93-2	50 - <100%
Calcium Carbonate (Limestone)	1317-65-3	5 - <10%
Cellulose	9004-34-6	1 - <5%
Creosote	8001-58-9	1 - <5%
Phenanthrene	85-01-8	1 - <5%
Fluorathene	206-44-0	1 - <5%
Clay	1332-58-7	0.1 - <1%
Naphthalene	91-20-3	0.1 - <1%
Anthracene	120-12-7	0.001 - <1%
Indeno[1,2,3-cd]pyrene	193-39-5	0.1 - <1%
Benzo(a)anthracene	56-55-3	0.1 - <1%
Chrysene	218-01-9	0.1 - <1%
Benzo(a)pyrene	50-32-8	0.3 - <1%
Acenaphthene	83-32-9	0.1 - <1%
Dibenzofuran	132-64-9	0.1 - <1%
Benzo(b)fluoranthene/benzo[e] acefenantrileno	205-99-2	0.1 - <1%
Crystalline Silica (Quartz)/ Silica Sand	14808-60-7	0.1 - <1%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Ingestion: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.

Inhalation: Move to fresh air.

Skin Contact: Get medical attention if symptoms occur. Destroy or thoroughly clean contaminated shoes. Immediately remove contaminated clothing and shoes and wash skin with soap and plenty of water. If skin irritation or an allergic skin reaction develops, get medical attention.

Eye contact: Any material that contacts the eye should be washed out immediately with water. If easy to do, remove contact lenses. If eye irritation persists: Get medical advice/attention.

Most important symptoms/effects, acute and delayed

Symptoms: May cause skin and eye irritation.

Indication of immediate medical attention and special treatment needed

Treatment: Symptoms may be delayed.

5. Fire-fighting measures

General Fire Hazards: No unusual fire or explosion hazards noted.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media:	Use fire-extinguishing media appropriate for surrounding materials.
Unsuitable extinguishing media:	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical:	During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters

Special fire fighting procedures:	No data available.
Special protective equipment for fire-fighters:	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:	See Section 8 of the SDS for Personal Protective Equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep unauthorized personnel away.
Methods and material for containment and cleaning up:	Dam and absorb spillages with sand, earth or other non-combustible material. Collect spillage in containers, seal securely and deliver for disposal according to local regulations.
Notification Procedures:	In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.
Environmental Precautions:	Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so. Avoid release to the environment.

7. Handling and storage

Precautions for safe handling:	Do not handle until all safety precautions have been read and understood. Obtain special instructions before use. Use personal protective equipment as required. Avoid contact with eyes, skin, and clothing. Wash hands thoroughly after handling. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities:	Store locked up.

8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

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Chemical Identity	Type	Exposure Limit Values	Source
Coal tar pitch - Aerosol. - as benzene solubles	TWA	0.2 mg/m3	US. ACGIH Threshold Limit Values (2011)
Coal tar pitch	PEL	0.2 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Calcium Carbonate (Limestone) - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Calcium Carbonate (Limestone) - Respirable fraction.	PEL	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Cellulose	TWA	10 mg/m3	US. ACGIH Threshold Limit Values (2011)
Cellulose - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Cellulose - Respirable fraction.	PEL	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Clay - Respirable fraction.	TWA	2 mg/m3	US. ACGIH Threshold Limit Values (2011)
	PEL	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Clay - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	TWA	50 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
Clay - Respirable fraction.	TWA	15 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
	TWA	5 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
Clay - Total dust.	TWA	15 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (03 2016)
Naphthalene	TWA	10 ppm	US. ACGIH Threshold Limit Values (2011)
	PEL	10 ppm 50 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Crystalline Silica (Quartz)/ Silica Sand - Respirable fraction.	TWA	0.025 mg/m3	US. ACGIH Threshold Limit Values (2011)
Crystalline Silica (Quartz)/ Silica Sand - Respirable dust.	TWA	0.05 mg/m3	US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053) (03 2016)
	OSHA_ACT	0.025 mg/m3	US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053) (03 2016)
Crystalline Silica (Quartz)/ Silica Sand - Respirable dust.	PEL	0.05 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (03 2016)
Crystalline Silica (Quartz)/ Silica Sand - Respirable.	TWA	2.4 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (2000)
	TWA	0.1 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (2000)

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Chemical name	Type	Exposure Limit Values	Source
Coal tar pitch - Aerosol. - as benzene solubles	TWA	0.2 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Coal tar pitch - Aerosol. - as benzene solubles	TWA	0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)
Coal tar pitch - as benzene solubles	TWA	0.2 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)
Calcium Carbonate (Limestone) - Total dust.	STEL	20 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Calcium Carbonate (Limestone) - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Calcium Carbonate (Limestone) - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)
Cellulose - Respirable fraction.	TWA	3 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Cellulose - Total dust.	TWA	10 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Cellulose	TWA	10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)
Cellulose - Total dust.	TWA	10 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)
Naphthalene	STEL	15 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWA	10 ppm	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Naphthalene	TWA	10 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)
	STEL	15 ppm	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)
Naphthalene	TWA	10 ppm 52 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)
	STEL	15 ppm 79 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)

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Benzo(a)pyrene	TWA	0.005 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)
Crystalline Silica (Quartz)/ Silica Sand - Respirable fraction.	TWA	0.025 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
Crystalline Silica (Quartz)/ Silica Sand - Respirable fraction.	TWA	0.10 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (06 2015)
Crystalline Silica (Quartz)/ Silica Sand - Respirable dust.	TWA	0.1 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (09 2017)

Biological Limit Values

Chemical Identity	Exposure Limit Values	Source
Benzo(a)anthracene (1-Hydroxypyrene, with hydrolysis (1-HP): Sampling time: End of shift at end of work week.)	2.5 µg/l (Urine)	ACGIH BEI (03 2017)
Chrysene (1-Hydroxypyrene, with hydrolysis (1-HP): Sampling time: End of shift at end of work week.)	2.5 µg/l (Urine)	ACGIH BEI (03 2017)
Benzo(a)pyrene (1-Hydroxypyrene, with hydrolysis (1-HP): Sampling time: End of shift at end of work week.)	2.5 µg/l (Urine)	ACGIH BEI (03 2017)
Benzo(b)fluoranthene/benzo[e]acefenantrileno (1-Hydroxypyrene, with hydrolysis (1-HP): Sampling time: End of shift at end of work week.)	2.5 µg/l (Urine)	ACGIH BEI (03 2017)

Appropriate Engineering Controls

Observe good industrial hygiene practices. Observe occupational exposure limits and minimize the risk of inhalation of vapors and mist. Mechanical ventilation or local exhaust ventilation may be required.

Individual protection measures, such as personal protective equipment

General information:

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. Supplementary local exhaust ventilation, closed systems, or respiratory and eye protection may be needed in special circumstances, such as poorly ventilated spaces, heating, evaporation of liquids from large surfaces, spraying of mists, mechanical generation of dusts, drying of solids, etc.

Eye/face protection:

Wear safety glasses with side shields (or goggles).

Skin Protection

Hand Protection:

Use suitable protective gloves if risk of skin contact.

Other:

Wear suitable protective clothing. Wear chemical-resistant gloves, footwear, and protective clothing appropriate for the risk of exposure. Contact health and safety professional or manufacturer for specific information.

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Respiratory Protection:	In case of inadequate ventilation use suitable respirator. Seek advice from local supervisor.
Hygiene measures:	Observe good industrial hygiene practices. Wash hands before breaks and immediately after handling the product. Do not handle until all safety precautions have been read and understood. Obtain special instructions before use. Contaminated work clothing should not be allowed out of the workplace. Avoid contact with skin.

9. Physical and chemical properties

Appearance

Physical state:	liquid
Form:	liquid
Color:	Black
Odor:	Aromatic
Odor threshold:	No data available.
pH:	No data available.
Melting point/freezing point:	No data available.
Initial boiling point and boiling range:	150 °C 302 °F
Flash Point:	> 93 °C > 199 °F
Evaporation rate:	Slower than Ether
Flammability (solid, gas):	No
Upper/lower limit on flammability or explosive limits	
Flammability limit - upper (%):	No data available.
Flammability limit - lower (%):	No data available.
Explosive limit - upper (%):	No data available.
Explosive limit - lower (%):	No data available.
Vapor pressure:	No data available.
Vapor density:	Vapors are heavier than air and may travel along the floor and in the bottom of containers.
Relative density:	1.26
Solubility(ies)	
Solubility in water:	Practically Insoluble
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Auto-ignition temperature:	No data available.
Decomposition temperature:	No data available.
Viscosity:	No data available.

10. Stability and reactivity

Reactivity:	No data available.

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Chemical Stability:	Material is stable under normal conditions.
Possibility of hazardous reactions:	No data available.
Conditions to avoid:	Avoid heat or contamination.
Incompatible Materials:	Avoid contact with oxidizing agents (e.g. nitric acid, peroxides and chromates).
Hazardous Decomposition Products:	Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapors.

11. Toxicological information

Information on likely routes of exposure

Inhalation:	In high concentrations, vapors, fumes or mists may irritate nose, throat and mucus membranes.
Skin Contact:	May be harmful in contact with skin. May cause an allergic skin reaction.
Eye contact:	Eye contact is possible and should be avoided.
Ingestion:	May be ingested by accident. Ingestion may cause irritation and malaise.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation:	No data available.
Skin Contact:	No data available.
Eye contact:	No data available.
Ingestion:	No data available.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral
Product: 725.00 mg/kg
ATEmix : 16,695.42 mg/kg

Dermal
Product: ATEmix: 2,186.07 mg/kg

Inhalation
Product:

Specified substance(s):

Cellulose	LC 50 (Rabbit): 20.1 mg/l

Repeated dose toxicity
Product: No data available.

Skin Corrosion/Irritation
Product: No data available.

Specified substance(s):

Coal tar pitch	in vivo (Rabbit): Not irritant Experimental result, Key study
Naphthalene	in vivo (Rabbit): Not irritant Experimental result, Key study
Anthracene	in vivo (Rabbit): Not irritant Experimental result, Key study

Serious Eye Damage/Eye Irritation
Product: No data available.
Specified substance(s):

Coal tar pitch	Rabbit, 1 hrs: Not irritating
Anthracene	Rabbit, 24 hrs: Not irritating

Respiratory or Skin Sensitization
Product: No data available.

Carcinogenicity
Product: No data available.

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IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

Coal tar pitch	Overall evaluation: Carcinogenic to humans.
Creosote	Overall evaluation: Probably carcinogenic to humans.
Naphthalene	Overall evaluation: Possibly carcinogenic to humans.
Indeno[1,2,3-cd]pyrene	Overall evaluation: Possibly carcinogenic to humans.
Benzo(a)anthracene	Overall evaluation: Possibly carcinogenic to humans.
Chrysene	Overall evaluation: Possibly carcinogenic to humans.
Benzo(a)pyrene	Overall evaluation: Carcinogenic to humans.
Benzo(b)fluoranthene/benzo[e]acefenantrileno	Overall evaluation: Possibly carcinogenic to humans.
Crystalline Silica (Quartz)/ Silica Sand	Overall evaluation: Carcinogenic to humans.

US. National Toxicology Program (NTP) Report on Carcinogens:

Coal tar pitch	Known To Be Human Carcinogen.
Naphthalene	Reasonably Anticipated to be a Human Carcinogen.
Indeno[1,2,3-cd]pyrene	Reasonably Anticipated to be a Human Carcinogen.
Benzo(a)anthracene	Reasonably Anticipated to be a Human Carcinogen.
Benzo(a)pyrene	Reasonably Anticipated to be a Human Carcinogen.
Benzo(b)fluoranthene/benzo[e]acefenantrileno	Reasonably Anticipated to be a Human Carcinogen.
Crystalline Silica (Quartz)/ Silica Sand	Known To Be Human Carcinogen.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):

Crystalline Silica (Quartz)/ Silica Sand	Cancer

11/21

800000051301

Germ Cell Mutagenicity

In vitro
Product: No data available.

In vivo
Product: No data available.

Reproductive toxicity
Product: May damage fertility or the unborn child.

Specific Target Organ Toxicity - Single Exposure
Product: No data available.

Specific Target Organ Toxicity - Repeated Exposure
Product: No data available.

Aspiration Hazard
Product: No data available.

Other effects: No data available.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish
Product: No data available.

Specified substance(s):

Phenanthrene	LC 50 (Rainbow trout,donaldson trout (Oncorhynchus mykiss), 96 h): 3.2 mg/l Mortality
Fluorathene	LC 50 (Fathead minnow (Pimephales promelas), 96 h): 0.074 - 0.113 mg/l Mortality
Naphthalene	LC 50 (Fathead minnow (Pimephales promelas), 96 h): 4.9 mg/l Mortality
Anthracene	LC 50 (Bluegill (Lepomis macrochirus), 96 h): 0.00594 - 0.00781 mg/l Mortality
Acenaphthene	LC 50 (Fathead minnow (Pimephales promelas), 96 h): 0.52 - 0.71 mg/l Mortality

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Dibenzofuran	LC 50 (Sheepshead minnow (Cyprinodon variegatus), 48 h): > 3.2 mg/l Mortality LC 50 (Sheepshead minnow (Cyprinodon variegatus), 72 h): 2.6 - 4.2 mg/l Mortality LC 50 (Fathead minnow (Pimephales promelas), 96 h): 0.84 - 1.31 mg/l Mortality LC 50 (Fathead minnow (Pimephales promelas), 96 h): 1.04 - 1.25 mg/l Mortality LC 50 (Fathead minnow (Pimephales promelas), 96 h): 1.62 - 1.95 mg/l Mortality

Aquatic Invertebrates

Product:	No data available.

Specified substance(s):

Phenanthrene	LC 50 (Water flea (Daphnia magna), 48 h): 0.59 - 0.84 mg/l Mortality
Fluorathene	LC 50 (Water flea (Daphnia magna), 24 h): 1,000 - 1,600 mg/l Mortality EC 50 (Water flea (Daphnia magna), 7 d): > 0.01 - 0.012 mg/l Intoxication LC 50 (Purple-spined sea urchin (Arbacia punctulata), 48 h): > 0.127 mg/l Mortality EC 50 (Water flea (Daphnia magna), 7 d): > 0.01 - 0.015 mg/l Intoxication LC 50 (Purple-spined sea urchin (Arbacia punctulata), 96 h): > 0.033 mg/l Mortality
Naphthalene	LC 50 (Water flea (Daphnia magna), 48 h): 3.4 mg/l Mortality
Anthracene	EC 50 (Water flea (Daphnia magna), 24 h): 0.189 - 0.236 mg/l Intoxication LC 50 (Pacific oyster (Crassostrea gigas), 48 h): > 5 mg/l Mortality LC 50 (Clam (Mulinia lateralis), 96 h): > 13.3 mg/l Mortality
Benzo(a)anthracene	LC 50 (Water flea (Daphnia pulex), 96 h): 0.01 mg/l Mortality
Chrysene	LC 50 (Polychaete worm (Nereis arenaceodentata), 96 h): < 1 mg/l Mortality
Benzo(a)pyrene	EC 50 (Water flea (Daphnia magna), 24 h): 0.032 - 0.049 mg/l Intoxication LC 50 (Scud (Gammarus duebeni), 48 h): < 150 mg/l Mortality LC 50 (Polychaete worm (Nereis arenaceodentata), 96 h): < 1 mg/l Mortality
Acenaphthene	LC 50 (Water flea (Daphnia magna), 24 h): > 280 mg/l Mortality LC 50 (Snail (Aplexa hypnorum), 96 h): > 2.04 mg/l Mortality
Dibenzofuran	LC 50 (Water flea (Daphnia magna), 24 h): 4.4 - 13 mg/l Mortality
Benzo(b)fluoranthene/benzo[e]acefenantrileno	EC 50 (Water flea (Daphnia magna), 24 h): > 1.024 mg/l Intoxication

Chronic hazards to the aquatic environment:

Fish

Product:	No data available.

Specified substance(s):

Coal tar pitch	LC 50 (Danio rerio, 42 d): > 4 µg/l Read-across from supporting substance (structural analogue or surrogate), Key study NOAEL (Danio rerio, 42 d): 4 µg/l Read-across from supporting substance

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(structural analogue or surrogate), Key study

Aquatic Invertebrates
Product: No data available.

Toxicity to Aquatic Plants
Product: No data available.

Persistence and Degradability

Biodegradation
Product: No data available.

BOD/COD Ratio
Product: No data available.

Bioaccumulative potential
Bioconcentration Factor (BCF)
Product: No data available.

Specified substance(s):

Phenanthrene	Water flea (Daphnia pulex), Bioconcentration Factor (BCF): 325 (Static)
Fluorathene	Water flea (Daphnia magna), Bioconcentration Factor (BCF): 1,741.8 (Static)
Naphthalene	Rainbow trout,donaldson trout (Oncorhynchus mykiss), Bioconcentration Factor (BCF): 13,000 (Flow through)
Anthracene	Green algae (Chlorella fusca vacuolata), Bioconcentration Factor (BCF): 7,800 (Static)
Benzo(a)anthracene	Water flea (Daphnia pulex), Bioconcentration Factor (BCF): 10,109 (Static)
Chrysene	Water flea (Daphnia magna), Bioconcentration Factor (BCF): 6,088.4 (Static)
Benzo(a)pyrene	Water flea (Daphnia pulex), Bioconcentration Factor (BCF): 2,720 (Static)
Acenaphthene	Bluegill (Lepomis macrochirus), Bioconcentration Factor (BCF): 387 (Flow through)
Benzo(b)fluoranthene/benzo[e]acefenantrileno	Mussel (Mytilus edulis planulatus), Bioconcentration Factor (BCF): 5,200,000 (Lentic - static water system without measurable flow rate (e.g. lake)) Bioconcentration factor calculated using dry weight tissue conc

Partition Coefficient n-octanol / water (log Kow)
Product: No data available.

Specified substance(s):

Creosote	Log Kow: 1.0
Phenanthrene	Log Kow: 4.57

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Fluorathene	Log Kow: 5.16
Naphthalene	Log Kow: 3.30
Anthracene	Log Kow: 4.45
Benzo(a)anthracene	Log Kow: 5.79
Chrysene	Log Kow: 5.73
Benzo(a)pyrene	Log Kow: 5.97
Acenaphthene	Log Kow: 3.92
Dibenzofuran	Log Kow: 4.12
Benzo(b)fluoranthene/benzo[e]acefenantrileno	Log Kow: 6.60

Mobility in soil: No data available.

Other adverse effects: Very toxic to aquatic organisms.

13. Disposal considerations

Disposal instructions: Dispose of waste at an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Contaminated Packaging: No data available.

14. Transport information

TDG:

Not Regulated

CFR / DOT:

Not Regulated

IMDG:

UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Coal Tar), 9, PG III, MARINE POLLUTANT

Further Information:
The above shipping description may not be accurate for all container sizes and all modes of transportation. Please refer to Bill of Lading.

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15. Regulatory information

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

None present or none present in regulated quantities.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Chemical Identity	OSHA hazard(s)
Crystalline Silica (Quartz)/ Silica Sand	kidney effects lung effects immune system effects Cancer

CERCLA Hazardous Substance List (40 CFR 302.4):

Chemical Identity	Reportable quantity
Creosote	1 lbs.
Fluorathene	100 lbs.
Phenanthrene	5000 lbs.
Naphthalene	100 lbs.
Anthracene	5000 lbs.
Indeno[1,2,3-cd]pyrene	100 lbs.
Benzo(a)anthracene	10 lbs.
Chrysene	100 lbs.
Benzo(a)pyrene	1 lbs.
Acenaphthene	100 lbs.
Dibenzofuran	100 lbs.
Benzo(b)fluoranthene/benzo[e]acefenantrileno	1 lbs.
Biphenyl	100 lbs.
Dibenz(a,h)anthracene	1 lbs.
Pyrene	5000 lbs.
Acenaphthylene	5000 lbs.
Fluorene	5000 lbs.
Quinoline	5000 lbs.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate (Acute) Health Hazards
Delayed (Chronic) Health Hazard
Skin sensitizer
Germ Cell Mutagenicity
Carcinogenicity
Toxic to reproduction

SARA 302 Extremely Hazardous Substance

Chemical Identity	Reportable quantity	Threshold Planning Quantity
Pyrene	5000 lbs.	- -- -

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SARA 304 Emergency Release Notification

Chemical Identity	Reportable quantity
Creosote	1 lbs.
Fluorathene	100 lbs.
Phenanthrene	5000 lbs.
Naphthalene	100 lbs.
Anthracene	5000 lbs.
Indeno[1,2,3-cd]pyrene	100 lbs.
Benzo(a)anthracene	10 lbs.
Chrysene	100 lbs.
Benzo(a)pyrene	1 lbs.
Acenaphthene	100 lbs.
Dibenzofuran	100 lbs.
Benzo(b)fluoranthene/benzo[e]acefenantrileno	1 lbs.
Biphenyl	100 lbs.
Dibenz(a,h)anthracene	1 lbs.
Pyrene	5000 lbs.
Acenaphthylene	5000 lbs.
Fluorene	5000 lbs.
Quinoline	5000 lbs.

SARA 311/312 Hazardous Chemical

Chemical Identity	Threshold Planning Quantity
Pyrene	500lbs
Coal tar pitch	10000 lbs
Calcium Carbonate (Limestone)	10000 lbs
Cellulose	10000 lbs
Creosote	10000 lbs
Phenanthrene	10000 lbs
Fluorathene	10000 lbs
Clay	10000 lbs
Naphthalene	10000 lbs
Anthracene	10000 lbs
Indeno[1,2,3-cd]pyrene	10000 lbs
Benzo(a)anthracene	10000 lbs
Chrysene	10000 lbs
Benzo(a)pyrene	10000 lbs
Acenaphthene	10000 lbs
Dibenzofuran	10000 lbs
Benzo(b)fluoranthene/benzo[e]acefenantrileno	10000 lbs
Crystalline Silica (Quartz)/ Silica Sand	10000 lbs

SARA 313 (TRI Reporting)

Chemical Identity
Creosote
Fluorathene
Phenanthrene
Naphthalene
Indeno[1,2,3-cd]pyrene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene/benzo[e]acefenantrileno

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

None present or none present in regulated quantities.

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Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)
None present or none present in regulated quantities.

US State Regulations

US. California Proposition 65

WARNING
Cancer - www.P65Warnings.ca.gov

US. New Jersey Worker and Community Right-to-Know Act

Chemical Identity
Coal tar pitch
Calcium Carbonate (Limestone)
Cellulose
Creosote
Fluorathene
Phenanthrene
Naphthalene
Indeno[1,2,3-cd]pyrene
Benzo(a)anthracene
Chrysene
Benzo(a)pyrene
Benzo(b)fluoranthene/benzo[e]acefenantrileno
Crystalline Silica (Quartz)/ Silica Sand

US. Massachusetts RTK - Substance List

Chemical Identity
Coal tar pitch
Calcium Carbonate (Limestone)
Cellulose
Creosote
Fluorathene
Phenanthrene
Indeno[1,2,3-cd]pyrene
Benzo(a)anthracene
Chrysene
Benzo(a)pyrene
Benzo(b)fluoranthene/benzo[e]acefenantrileno
Crystalline Silica (Quartz)/ Silica Sand
Dibenz(a,h)anthracene
Pyrene

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US. Pennsylvania RTK - Hazardous Substances

Chemical Identity
Coal tar pitch
Calcium Carbonate (Limestone)
Cellulose
Creosote
Fluorathene
Phenanthrene
Indeno[1,2,3-cd]pyrene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene/benzo[e]acefenantrileno

US. Rhode Island RTK

Chemical Identity
Calcium Carbonate (Limestone)
Cellulose

International regulations

Montreal protocol
Not applicable

Stockholm convention
Not applicable

Rotterdam convention
Not applicable

Kyoto protocol
Not applicable

VOC:

Regulatory VOC (less water and exempt solvent)	:	299 g/l
VOC Method 310	:	24.00 % 0.01 %

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Inventory Status:

Australia AICS:	One or more components in this product are not listed on or exempt from the Inventory.
Canada DSL Inventory List:	One or more components in this product are not listed on or exempt from the Inventory.
EINECS, ELINCS or NLP:	One or more components in this product are not listed on or exempt from the Inventory.
Japan (ENCS) List:	One or more components in this product are not listed on or exempt from the Inventory.
China Inv. Existing Chemical Substances:	One or more components in this product are not listed on or exempt from the Inventory.
Korea Existing Chemicals Inv. (KECI):	One or more components in this product are not listed on or exempt from the Inventory.
Canada NDSL Inventory:	One or more components in this product are not listed on or exempt from the Inventory.
Philippines PICCS:	One or more components in this product are not listed on or exempt from the Inventory.
US TSCA Inventory:	One or more components in this product are not listed on or exempt from the Inventory.
New Zealand Inventory of Chemicals:	One or more components in this product are not listed on or exempt from the Inventory.
Japan ISHL Listing:	One or more components in this product are not listed on or exempt from the Inventory.
Japan Pharmacopoeia Listing:	One or more components in this product are not listed on or exempt from the Inventory.
Mexico INSQ:	One or more components in this product are not listed on or exempt from the Inventory.
Ontario Inventory:	One or more components in this product are not listed on or exempt from the Inventory.
Taiwan Chemical Substance Inventory:	One or more components in this product are not listed on or exempt from the Inventory.

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16.Other information, including date of preparation or last revision

Revision Date:	07/21/2018
Version #:	1.1
Further Information:	No data available.
Disclaimer:	For Industrial Use Only. Keep out of Reach of Children. The hazard information herein is offered solely for the consideration of the user, subject to their own investigation of compliance with applicable regulations, including the safe use of the product under every foreseeable condition.