

FICHA DE DATOS DE SEGURIDAD

(de acuerdo con el Reglamento (UE) 2020/878)

211A1T-SULFATO DE ZINC 1-H

Versión 1 Fecha de emisión: 15/02/2010

Versión 18 (sustituye a la versión 17)

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SECCIÓN 1: IDENTIFICACIÓN DE LA SUSTANCIA O LA MEZCLA Y DE LA SOCIEDAD O LA EMPRESA.

1.1 Identificador de producto.

Nombre del producto: SULFATO DE ZINC 1-H
Código del producto: 211A1T
Nombre químico: sulfato de cinc (hidratado) (mono-, hexay heptahidratado)
N. Índice: 030-006-00-9
N. CAS: 7446-19-7
N. CE: 231-793-3
N. registro: 01-2119474684-27-XXXX

1.2 Usos pertinentes identificados de la sustancia o de la mezcla y usos desaconsejados.

Genérico industrial
Fertilizante

Usos desaconsejados:
Usos distintos a los aconsejados.

1.3 Datos del proveedor de la ficha de datos de seguridad.

Empresa: **Barcelonesa de Drogas y Productos Químicos, S.A.**
Dirección: Crom, 14 - P.I. FAMADES
Población: Cornellà del Llobregat
Provincia: Barcelona
Teléfono: 93 377 02 08
Fax: 93 377 42 49
E-mail: barcelonesa@barcelonesa.com
Web: www.grupbarcelonesa.com

1.4 Teléfono de emergencia: +34 933 770 208 (Sólo disponible en horario de oficina; Lunes-Viernes; 09:00-18:00)

SECCIÓN 2: IDENTIFICACIÓN DE LOS PELIGROS.

2.1 Clasificación de la sustancia o de la mezcla.

Según el Reglamento (EU) No 1272/2008:

Acute Tox. 4 : Nocivo en caso de ingestión.

Aquatic Acute 1 : Muy tóxico para los organismos acuáticos.

Aquatic Chronic 1 : Muy tóxico para los organismos acuáticos, con efectos nocivos duraderos.

Eye Dam. 1 : Provoca lesiones oculares graves.

2.2 Elementos de la etiqueta.

Etiquetado conforme al Reglamento (EU) No 1272/2008:

Pictogramas:



Palabra de advertencia:

Peligro

Indicaciones de peligro:

H302 Nocivo en caso de ingestión.

H318 Provoca lesiones oculares graves.

H410 Muy tóxico para los organismos acuáticos, con efectos nocivos duraderos.

Consejos de prudencia:

P264 Lavarse concienzudamente tras la manipulación

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P273	Evitar su liberación al medio ambiente.
P280	Llevar guantes/prendas/gafas/máscara de protección.
P305+P351+P338	EN CASO DE CONTACTO CON LOS OJOS: Enjuagar con agua cuidadosamente durante varios minutos. Quitar las lentes de contacto cuando estén presentes y pueda hacerse con facilidad. Proseguir con el lavado.
P310	Llamar inmediatamente a un CENTRO DE TOXICOLOGÍA/médico.
P391	Recoger el vertido.
P501	Eliminar el contenido/el recipiente en un tratador autorizado de residuos.

2.3 Otros peligros.

La sustancia no es PBT

La sustancia no es mPmB

La sustancia no tiene propiedades de alteración endocrina.

En condiciones de uso normal y en su forma original, el producto no tiene ningún otro efecto negativo para la salud y el medio ambiente.

SECCIÓN 3: COMPOSICIÓN/INFORMACIÓN SOBRE LOS COMPONENTES.

3.1 Sustancias.

Identificadores	Nombre	Concentración	(*)Clasificación - Reglamento 1272/2008	
			Clasificación	Límites de concentración específicos y Estimación de Toxicidad Aguda
: 030-006-00-9 : 7446-19-7 : 231-793-3	sulfato de cinc (hidratado) (mono-, hexay heptahidratado)	25 - 100 %	Acute Tox. 4 *, H302 - Aquatic Acute 1, H400 - Aquatic Chronic 1, H410 - Eye Dam. 1, H318	-

* Consultar Reglamento (CE) N° 1272/2008, Anexo VI, sección 1.2.

3.2 Mezclas.

No Aplicable.

SECCIÓN 4: PRIMEROS AUXILIOS.

4.1 Descripción de los primeros auxilios.

En los casos de duda, o cuando persistan los síntomas de malestar, solicitar atención médica. No administrar nunca nada por vía oral a personas que se encuentren inconscientes.

Inhalación.

Situar al accidentado al aire libre, mantenerle caliente y en reposo, si la respiración es irregular o se detiene, practicar respiración artificial.

Contacto con los ojos.

Lavar abundantemente los ojos con agua limpia y fresca durante, por lo menos, 10 minutos, tirando hacia arriba de los párpados y buscar asistencia médica. No permita que la persona se frote el ojo afectado.

Contacto con la piel.

Quitar la ropa contaminada. Lavar la piel vigorosamente con agua y jabón o un limpiador de piel adecuado. NUNCA utilizar disolventes o diluyentes.

Ingestión.

Si accidentalmente se ha ingerido, buscar inmediatamente atención médica. Mantenerle en reposo. NUNCA provocar el vómito.

4.2 Principales síntomas y efectos, agudos y retardados.

Producto Corrosivo, el contacto con los ojos o con la piel puede producir quemaduras, la ingestión o la inhalación puede producir daños internos, en el caso de producirse se requiere asistencia médica inmediata.

Producto Nocivo, una exposición prolongada por inhalación puede causar efectos anestésicos y la necesidad de asistencia médica inmediata.

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El contacto con los ojos puede producir daños irreversibles.

4.3 Indicación de toda atención médica y de los tratamientos especiales que deban dispensarse inmediatamente.

En los casos de duda, o cuando persistan los síntomas de malestar, solicitar atención médica. No administrar nunca nada por vía oral a personas que se encuentren inconscientes. No inducir el vómito. Si la persona vomita, despeje las vías respiratorias.

SECCIÓN 5: MEDIDAS DE LUCHA CONTRA INCENDIOS.

El producto NO está clasificado como inflamable, en caso de incendio se deben seguir las medidas expuestas a continuación:

5.1 Medios de extinción.

Medios de extinción apropiados:

Polvos extintor o CO₂. En caso de incendios más graves también espuma resistente al alcohol y agua pulverizada.

Medios de extinción no apropiados:

No usar para la extinción chorro directo de agua. En presencia de tensión eléctrica no es aceptable utilizar agua o espuma como medio de extinción.

5.2 Peligros específicos derivados de la sustancia o la mezcla.

Riesgos especiales.

La exposición a los productos de combustión o descomposición puede ser perjudicial para la salud.

5.3 Recomendaciones para el personal de lucha contra incendios.

Refrigerar con agua los tanques, cisternas o recipientes próximos a la fuente de calor o fuego. Tener en cuenta la dirección del viento. Evitar que los productos utilizados en la lucha contra incendio pasen a desagües, alcantarillas o cursos de agua. Los restos de producto y medios de extinción pueden contaminar el medio ambiente acuático.

Equipo de protección contra incendios.

Según la magnitud del incendio, puede ser necesario el uso de trajes de protección contra el calor, equipo respiratorio autónomo, guantes, gafas protectoras o máscaras faciales y botas.

SECCIÓN 6: MEDIDAS EN CASO DE VERTIDO ACCIDENTAL.

6.1 Precauciones personales, equipo de protección y procedimientos de emergencia.

Para control de exposición y medidas de protección individual, ver sección 8.

6.2 Precauciones relativas al medio ambiente.

Producto peligroso para el medio ambiente, en caso de producirse grandes vertidos o si el producto contamina lagos, ríos o alcantarillas, informar a las autoridades competentes, según la legislación local. Evitar la contaminación de desagües, aguas superficiales o subterráneas, así como del suelo.

6.3 Métodos y material de contención y de limpieza.

Contener y recoger el vertido con material absorbente inerte (tierra, arena, vermiculita, tierra de diatomeas...) y limpiar la zona inmediatamente con un descontaminante adecuado.

Depositar los residuos en envases cerrados y adecuados para su eliminación, de conformidad con las normativas locales y nacionales (ver sección 13).

6.4 Referencia a otras secciones.

Para control de exposición y medidas de protección individual, ver sección 8.

Para la eliminación de los residuos, seguir las recomendaciones de la sección 13.

SECCIÓN 7: MANIPULACIÓN Y ALMACENAMIENTO.

7.1 Precauciones para una manipulación segura.

Para la protección personal, ver sección 8.

En la zona de aplicación debe estar prohibido fumar, comer y beber.

Cumplir con la legislación sobre seguridad e higiene en el trabajo.

No emplear nunca presión para vaciar los envases, no son recipientes resistentes a la presión. Conservar el producto en envases de un material idéntico al original.

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7.2 Condiciones de almacenamiento seguro, incluidas posibles incompatibilidades.

Almacenar según la legislación local. Observar las indicaciones de la etiqueta. Almacenar los envases entre 0 y 40 °C, en un lugar seco y bien ventilado, lejos de fuentes de calor y de la luz solar directa. Mantener lejos de puntos de ignición. Mantener lejos de agentes oxidantes y de materiales fuertemente ácidos o alcalinos. No fumar. Evitar la entrada a personas no autorizadas. Una vez abiertos los envases, han de volverse a cerrar cuidadosamente y colocarlos verticalmente para evitar derrames.

Clasificación y cantidad umbral de almacenaje de acuerdo con el Anexo I de la Directiva 2012/18/UE (SEVESO III):

Código	Descripción	Cantidad umbral (toneladas) a efectos de aplicación de los	
		requisitos de nivel inferior	requisitos de nivel superior
E1	PELIGROS PARA EL MEDIOAMBIENTE - Peligroso para el medio ambiente acuático en las categorías aguda 1 o crónica 1	100	200

7.3 Usos específicos finales.

No disponible.

SECCIÓN 8: CONTROLES DE EXPOSICIÓN/PROTECCIÓN INDIVIDUAL.

8.1 Parámetros de control.

El producto NO contiene sustancias con Valores Límite Ambientales de Exposición Profesional. El producto NO contiene sustancias con Valores Límite Biológicos.

8.2 Controles de la exposición.

Medidas de orden técnico:

Proveer una ventilación adecuada, lo cual puede conseguirse mediante una buena extracción-ventilación local y un buen sistema general de extracción.

Concentración:	100 %				
Usos:	Genérico industrial Fertilizante				
Protección respiratoria:					
EPI:	Máscara filtrante para la protección contra gases y partículas				
Características:	Marcado «CE» Categoría III. La máscara debe tener amplio campo de visión y forma anatómica para ofrecer estanqueidad y hermeticidad.				
Normas CEN:	EN 136, EN 140, EN 405				
Mantenimiento:	No se debe almacenar en lugares expuestos a temperaturas elevadas y ambientes húmedos antes de su utilización. Se debe controlar especialmente el estado de las válvulas de inhalación y exhalación del adaptador facial.				
Observaciones:	Se deberán leer atentamente las instrucciones del fabricante al respecto del uso y mantenimiento del equipo. Se acoplarán al equipo los filtros necesarios en función de las características específicas del riesgo (Partículas y aerosoles: P1-P2-P3, Gases y vapores: A-B-E-K-AX) cambiándose según aconseje el fabricante.				
Tipo de filtro necesario:	A2				
Protección de las manos:					
EPI:	Guantes de protección contra productos químicos				
Características:	Marcado «CE» Categoría III.				
Normas CEN:	EN 374-1, En 374-2, EN 374-3, EN 420				
Mantenimiento:	Se guardarán en un lugar seco, alejados de posibles fuentes de calor, y se evitará la exposición a los rayos solares en la medida de lo posible. No se realizarán sobre los guantes modificaciones que puedan alterar su resistencia ni se aplicarán pinturas, disolventes o adhesivos.				
Observaciones:	Los guantes deben ser de la talla correcta, y ajustarse a la mano sin quedar demasiado holgados ni demasiado apretados. Se deberán utilizar siempre con las manos limpias y secas.				
Material:	PVC (Cloruro de polivinilo)	Tiempo de penetración (min.):	> 480	Espesor del material (mm):	0,35
Protección de los ojos:					
EPI:	Gafas de protección con montura integral				
Características:	Marcado «CE» Categoría II. Protector de ojos de montura integral para la protección contra salpicaduras de líquidos, polvo, humos, nieblas y vapores.				

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Normas CEN:	EN 165, EN 166, EN 167, EN 168	
Mantenimiento:	La visibilidad a través de los oculares debe ser óptima para lo cual estos elementos se deben limpiar a diario, los protectores deben desinfectarse periódicamente siguiendo las instrucciones del fabricante.	
Observaciones:	Indicadores de deterioro pueden ser: coloración amarilla de los oculares, arañazos superficiales en los oculares, rasgaduras, etc.	
Protección de la piel:		
EPI:	Ropa de protección con propiedades antiestáticas	
Características:	Marcado «CE» Categoría II. La ropa de protección no debe ser estrecha o estar suelta para que no interfiera en los movimientos del usuario.	
Normas CEN:	EN 340, EN 1149-1, EN 1149-2, EN 1149-3, EN 1149-5	
Mantenimiento:	Se deben seguir las instrucciones de lavado y conservación proporcionadas por el fabricante para garantizar una protección invariable.	
Observaciones:	La ropa de protección debería proporcionar un nivel de confort consistente con el nivel de protección que debe proporcionar contra el riesgo contra el que protege, con las condiciones ambientales, el nivel de actividad del usuario y el tiempo de uso previsto.	
EPI:	Calzado de protección con propiedades antiestáticas	
Características:	Marcado «CE» Categoría II.	
Normas CEN:	EN ISO 13287, EN ISO 20344, EN ISO 20346	
Mantenimiento:	El calzado debe ser objeto de un control regular, si su estado es deficiente se deberá dejar de utilizar y ser reemplazado.	
Observaciones:	La comodidad en el uso y la aceptabilidad son factores que se valoran de modo muy distinto según los individuos. Por tanto conviene probar distintos modelos de calzado y, a ser posible, anchos distintos.	

SECCIÓN 9: PROPIEDADES FÍSICAS Y QUÍMICAS.

9.1 Información sobre propiedades físicas y químicas básicas.

Estado físico: Sólido

Color: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Olor: Inodoro

Umbral olfativo: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Punto de fusión: 231 °C

Punto de congelación: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Punto/Punto inicial/intervalo de ebullición: 240 °C

Inflamabilidad: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Límite inferior de explosión: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Límite superior de explosión: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Punto de inflamación: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Temperatura de auto-inflamación: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Temperatura de descomposición: 240°C (Se descompone al calentar)

pH: 3.8-4.3 (50 g/L, 20°C) en monohidratado

Viscosidad cinemática: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Solubilidad: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Hidrosolubilidad: 210 g/l

Liposolubilidad: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Coefficiente de reparto (n-octanol/agua)(valor logaritmico): No aplicable, la sustancia es inorgánica

Presión de vapor: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Densidad absoluta: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Densidad relativa: 3.35

Densidad de vapor: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Características de las partículas: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

9.2 Otros datos.

Viscosidad: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Propiedades explosivas: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Propiedades comburentes: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Punto de gota: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

Centelleo: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

% Sólidos: No aplicable/No disponible debido a la naturaleza/las propiedades del producto.

SECCIÓN 10: ESTABILIDAD Y REACTIVIDAD.

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10.1 Reactividad.

El producto no presenta peligros debido a su reactividad.

10.2 Estabilidad química.

Estable bajo las condiciones de manipulación y almacenamiento recomendadas (ver epígrafe 7).

10.3 Posibilidad de reacciones peligrosas.

El producto no presenta posibilidad de reacciones peligrosas.

10.4 Condiciones que deben evitarse.

Evitar cualquier tipo de manipulación incorrecta.

10.5 Materiales incompatibles.

Mantener alejado de agentes oxidantes y de materiales fuertemente alcalinos o ácidos, a fin de evitar reacciones exotérmicas.

10.6 Productos de descomposición peligrosos.

No se descompone si se destina a los usos previstos.

SECCIÓN 11: INFORMACIÓN TOXICOLÓGICA.

11.1 Información sobre las clases de peligro definidas en el Reglamento (CE) nº 1272/2008.

Las salpicaduras en los ojos pueden causar irritación y daños reversibles.

Información Toxicológica.

Nombre	Toxicidad aguda			
	Tipo	Ensayo	Especie	Valor
sulfato de cinc (hidratado) (mono-, hexay heptahidratado) N. CAS: 7446-19-7 N. CE: 231-793-3	Oral	LD50	Rata	920 - 4,725 mg/kg
	Cutánea	LD50	Rata	> 2000 mg/kg
	Inhalación			

a) toxicidad aguda;

Producto clasificado:

Toxicidad oral aguda, Categoría 4: Nocivo en caso de ingestión.

b) corrosión o irritación cutáneas;

Datos no concluyentes para la clasificación.

c) lesiones oculares graves o irritación ocular;

Producto clasificado:

Lesión ocular grave, Categoría 1: Provoca lesiones oculares graves.

d) sensibilización respiratoria o cutánea;

Datos no concluyentes para la clasificación.

e) mutagenicidad en células germinales;

Datos no concluyentes para la clasificación.

f) carcinogenicidad;

Datos no concluyentes para la clasificación.

g) toxicidad para la reproducción;

Datos no concluyentes para la clasificación.

h) toxicidad específica en determinados órganos (STOT) - exposición única;

Datos no concluyentes para la clasificación.

i) toxicidad específica en determinados órganos (STOT) - exposición repetida;

Datos no concluyentes para la clasificación.

j) peligro por aspiración;

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Datos no concluyentes para la clasificación.

11.2 Información relativa a otros peligros.

Propiedades de alteración endocrina.

Este producto no contiene componentes con propiedades de alteración endocrina con efectos sobre la salud humana.

Otros datos.

No existe información disponible sobre otros efectos adversos para la salud.

SECCIÓN 12: INFORMACIÓN ECOLÓGICA.

12.1 Toxicidad.

Nombre	Ecotoxicidad			
	Tipo	Ensayo	Especie	Valor
sulfato de cinc (hidratado) (mono-, hexay heptahidratado) N. CAS: 7446-19-7 N. CE: 231-793-3	Peces	EC50	Ceriodaphnia dubia	1.8 mg Zn/l (48 h)
	Invertebrados acuáticos			
	Plantas acuáticas			

12.2 Persistencia y degradabilidad.

No se dispone de información relativa a la biodegradabilidad.

No se dispone de información relativa a la degradabilidad.

No existe información disponible sobre la persistencia y degradabilidad del producto.

12.3 Potencial de bioacumulación.

Información sobre la bioacumulación.

Nombre	Bioacumulación			
	Log Kow	BCF	NOECs	Nivel
sulfato de cinc (hidratado) (mono-, hexay heptahidratado) N. CAS: 7446-19-7 N. CE: 231-793-3	No aplicable la sustancia es inorgánica	-	-	Muy bajo

12.4 Movilidad en el suelo.

No existe información disponible sobre la movilidad en el suelo.

No se debe permitir que el producto pase a las alcantarillas o a cursos de agua.

Evitar la penetración en el terreno.

12.5 Resultados de la valoración PBT y mPmB.

No existe información disponible sobre la valoración PBT y mPmB del producto.

12.6 Propiedades de alteración endocrina.

Este producto no contiene componentes con propiedades de alteración endocrina sobre el medio ambiente.

12.7 Otros efectos adversos.

No existe información disponible sobre otros efectos adversos para el medio ambiente.

SECCIÓN 13: CONSIDERACIONES RELATIVAS A LA ELIMINACIÓN.

13.1 Métodos para el tratamiento de residuos.

No se permite su vertido en alcantarillas o cursos de agua. Los residuos y envases vacíos deben manipularse y eliminarse de acuerdo con las legislaciones local/nacional vigentes.

Seguir las disposiciones de la Directiva 2008/98/CE respecto a la gestión de residuos.

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SECCIÓN 14: INFORMACIÓN RELATIVA AL TRANSPORTE.

Transportar siguiendo las normas ADR/TPC para el transporte por carretera, las RID por ferrocarril, las IMDG por mar y las ICAO/IATA para transporte aéreo.

Tierra: Transporte por carretera: ADR, Transporte por ferrocarril: RID.

Documentación de transporte: Carta de porte e Instrucciones escritas.

Mar: Transporte por barco: IMDG.

Documentación de transporte: Conocimiento de embarque.

Aire: Transporte en avión: IATA/ICAO.

Documento de transporte: Conocimiento aéreo.

14.1 Número ONU o número ID.

Nº UN: UN3077

14.2 Designación oficial de transporte de las Naciones Unidas.

Descripción:

ADR/RID: UN 3077, SUSTANCIA SÓLIDA PELIGROSA PARA EL MEDIO AMBIENTE, N.E.P. (CONTIENE SULFATO DE ZINC (HIDRATADO) (MONO-, HEXAY HEPTAHIDRATADO)), 9, GE III, (-)

IMDG: UN 3077, SUSTANCIA SÓLIDA PELIGROSA PARA EL MEDIO AMBIENTE, N.E.P. (CONTIENE SULFATO DE ZINC (HIDRATADO) (MONO-, HEXAY HEPTAHIDRATADO)), 9, GE/E III, CONTAMINANTE DEL MAR

ICAO/IATA: UN 3077, SUSTANCIA SÓLIDA PELIGROSA PARA EL MEDIO AMBIENTE, N.E.P. (CONTIENE SULFATO DE ZINC (HIDRATADO) (MONO-, HEXAY HEPTAHIDRATADO)), 9, GE III

14.3 Clase(s) de peligro para el transporte.

Clase(s): 9

14.4 Grupo de embalaje.

Grupo de embalaje: III

14.5 Peligros para el medio ambiente.

Contaminante marino: Si



Peligroso para el medio ambiente

Transporte por barco, FEm - Fichas de emergencia (F – Incendio, S – Derrames): F-A,S-F

14.6 Precauciones particulares para los usuarios.

Etiquetas: 9



Número de peligro: 90

ADR cantidad limitada: 5 kg

IMDG cantidad limitada: 5 kg

ICAO cantidad limitada: 30 kg B

Disposiciones relativas al transporte a granel en ADR:

VC1 Está autorizado el transporte a granel en vehículos entoldados, en contenedores entoldados o en contenedores para granel entoldados.

VC2 Está autorizado el transporte a granel en vehículos cubiertos, en contenedores cerrados o en contenedores para granel cerrados.

Actuar según el punto 6.

14.7 Transporte marítimo a granel con arreglo a los instrumentos de la OMI.

FICHA DE DATOS DE SEGURIDAD

(de acuerdo con el Reglamento (UE) 2020/878)

211A1T-SULFATO DE ZINC 1-H



Versión 1 Fecha de emisión: 15/02/2010

Versión 18 (sustituye a la versión 17)

Fecha de revisión: 20/10/2023

Página 9 de 10

Fecha de impresión: 20/10/2023

El producto no está afectado por el transporte a granel en buques.

SECCIÓN 15: INFORMACIÓN REGLAMENTARIA.

15.1 Reglamentación y legislación en materia de seguridad, salud y medio ambiente específicas para la sustancia o la mezcla.

El producto no está afectado por el Reglamento (CE) nº 1005/2009 del Parlamento Europeo y del Consejo, de 16 de septiembre de 2009, sobre las sustancias que agotan la capa de ozono.

Clasificación del producto de acuerdo con el Anexo I de la Directiva 2012/18/UE (SEVESO III): E1

El producto no está afectado por el Reglamento (UE) No 528/2012 relativo a la comercialización y el uso de los biocidas.

El producto no se encuentra afectado por el procedimiento establecido en el Reglamento (UE) No 649/2012, relativo a la exportación e importación de productos químicos peligrosos.

Clase de contaminante para el agua (Alemania): WGK 2: Peligroso para el agua. (Autoclasificado según Reglamento AwSV)

15.2 Evaluación de la seguridad química.

No se ha llevado a cabo una evaluación de la seguridad química del producto.

Se dispone de Escenario de Exposición del producto.

SECCIÓN 16: OTRA INFORMACIÓN.

Códigos de clasificación:

Acute Tox. 4 : Toxicidad oral aguda, Categoría 4

Aquatic Acute 1 : Toxicidad aguda para el medio ambiente acuático, Categoría 1

Aquatic Chronic 1 : Efectos crónicos para el medio ambiente acuático, Categoría 1

Eye Dam. 1 : Lesión ocular grave, Categoría 1

Clasificación y procedimiento utilizado para determinar la clasificación de las mezclas con arreglo al Reglamento (CE) nº 1272/2008 [CLP]:

Peligros físicos

Conforme a datos obtenidos de los ensayos

Peligros para la salud

Método de cálculo

Peligros para el medio ambiente

Método de cálculo

Se aconseja realizar formación básica con respecto a seguridad e higiene laboral para realizar una correcta manipulación del producto.

Información sobre el Inventario TSCA (Toxic Substances Control Act) USA:

N. CAS	Nombre	Estado
7446-19-7	sulfato de cinc (hidratado) (mono-, hexay heptahidratado)	

Inventario DSL de Canadá (Lista de sustancias domésticas): Estado de registro

N. CAS	Nombre	Estado DSL	Estado NDSL
7446-19-7	sulfato de cinc (hidratado) (mono-, hexay heptahidratado)	Registrada	No

Se dispone de Escenario de Exposición del producto.

-Continúa en la página siguiente.-

FICHA DE DATOS DE SEGURIDAD

(de acuerdo con el Reglamento (UE) 2020/878)

211A1T-SULFATO DE ZINC 1-H



Versión 1 Fecha de emisión: 15/02/2010

Versión 18 (sustituye a la versión 17)

Fecha de revisión: 20/10/2023

Página 10 de 10

Fecha de impresión: 20/10/2023

Abreviaturas y acrónimos utilizados:

ADR/RID: Acuerdo sobre transporte internacional de mercancías peligrosas por carretera.

AWSV: Reglamento de Instalaciones para la manipulación de sustancias peligrosas para el agua.

BCF: Factor de bioconcentración.

CEN: Comité Europeo de Normalización.

EC50: Concentración efectiva media.

EPI: Equipo de protección personal.

IATA: Asociación Internacional de Transporte Aéreo.

ICAO: Organización de Aviación Civil Internacional.

IMDG: Código Marítimo Internacional de Mercancías Peligrosas.

LC50: Concentración Letal, 50%.

LD50: Dosis Letal, 50%.

NOEC: Concentración sin efecto observado.

RID: Regulación concerniente al transporte internacional de mercancías peligrosas por ferrocarril.

WGK: Clases de peligros para el agua.

Principales referencias bibliográficas y fuentes de datos:

<http://eur-lex.europa.eu/homepage.html>

<http://echa.europa.eu/>

Reglamento (UE) 2020/878.

Reglamento (CE) No 1907/2006.

Reglamento (EU) No 1272/2008.

La información facilitada en esta ficha de Datos de Seguridad ha sido redactada de acuerdo con el REGLAMENTO (UE) 2020/878 DE LA COMISIÓN de 18 de junio de 2020 por el que se modifica el anexo II del Reglamento (CE) n.o 1907/2006 del Parlamento Europeo y del Consejo, relativo al registro, la evaluación, la autorización y la restricción de las sustancias y mezclas químicas (REACH).

La información de esta Ficha de Datos de Seguridad del Producto está basada en los conocimientos actuales y en las leyes vigentes de la CE y nacionales, en cuanto que las condiciones de trabajo de los usuarios están fuera de nuestro conocimiento y control. El producto no debe utilizarse para fines distintos a aquellos que se especifican, sin tener primero una instrucción por escrito, de su manejo. Es siempre responsabilidad del usuario tomar las medidas oportunas con el fin de cumplir con las exigencias establecidas en las legislaciones.

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

Identification

Product name	Zinc Sulphate (ZnSO ₄)
REACH registration number	01-2119474684-27-xxxx
Revision Date	11.11.2013
Version Number	1.0

1.Title of exposure scenario – (1)

Main title Industrial use of ZnSO₄ in the formulation of preparations by mixing thoroughly, dry or in a solvent, the starting materials with potentially pressing, pelletising, sintering, possibly followed by packing.

Main sector SU3 Industrial uses

Sector of use SU2a Mining (without offshore industries)
SU8 Manufacture of bulk, large-scale chemicals (including petroleum products)
SU9 Manufacture of fine chemicals
SU10 Formulation [mixing] of preparations and/or re-packaging

Environment

Environmental release category ERC1 Manufacture of substances.
ERC2 Formulation of preparations.

Worker

Process category PROC1 Use in closed process, no likelihood of exposure.
PROC2 Use in closed, continuous process with occasional controlled exposure.
PROC3 Use in closed batch process (synthesis or formulation).
PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises.
PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing).
PROC13 Treatment of articles by dipping and pouring.
PROC14 Production of preparations or articles by tableting, compression, extrusion, pelletisation.
PROC15 Use as laboratory reagent.
PROC22 Potentially closed processing operations with minerals/metals at elevated temperature. Industrial setting.

Further explanations (if needed)

ZnSO₄ is used in the manufacture of preparations by mixing thoroughly the starting materials, followed by direct use of packaging of the preparation. Many different industrial uses are characterised by this process. Therefore these industrial uses are all covered by this exposure scenario.

2.Conditions of use affecting exposure (Industrial - Environment ES-1)

In the described process, the zinc sulphate is:

- Removed from the packaging and stored in silos after delivery.
- Extracted from the silo, dosed and fed with the other reagents to the mixing tank. Mixing occurs batchwise or continuously, according to the process receipt. The mixing occurs in a closed tank/chamber.
- The preparation (dry or wet (solvent/paste) matrix) is further used as such or packed for further treatment/use.

Product characteristics

ZnSO₄ is used in minimum 80% purity; higher grades (>95%) are usual

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

Amounts used

Daily and annual amount per site:
maximum 5000 T/y;

Frequency and duration of use

Continuous production is assumed as a worst case. It is possible that use is not continuous; this has to be considered when estimating exposure.

Environment factors not influenced by risk management

Flow rate of receiving surface water:
default for generic scenario: 18,000 m³/d, unless specified otherwise

Other given operational conditions affecting environmental exposure

- All processes are performed indoor in a confined area. All residues containing zinc are recycled.
- Even when no process waters (e.g. when dry process throughout), some non-process water can be generated containing zinc (e.g. from cleaning)

Technical conditions and measures at process level (source) to prevent release

- Process enclosures and closed circuits where relevant and possible.
- Dust capturing and removal techniques are applied on local exhaust ventilation on furnaces and other work areas with potential dust generation.
- Containment of liquid volumes in sumps to collect/prevent accidental spillage

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

- On-site waste water treatment techniques can be applied to prevent releases to water (if applicable) e.g.: chemical precipitation, sedimentation and filtration (efficiency 90-99.98%).
- Air emissions are controlled by use of bag-house filters and/or other air emission abatement devices e.g. fabric (or bag) filters (up to 99% efficiency), wet scrubbers (50-99% efficiency). This may create a general negative pressure in the building.

Organizational measures to prevent/limit release from site

- In general emissions are controlled and prevented by implementing an integrated management system e.g. ISO 9000, ISO 1400X series, or alike, and, when applicable, by being IPPC-compliant.
Such management system should include general industrial hygiene practice e.g.:
 - information and training of workers,
 - regular cleaning of equipment and floors,
 - procedures for process control and maintenance,...
- Treatment and monitoring of releases to outside air, and exhaust gas streams (process & hygiene), according to national regulation.
- SEVESO 2 compliance, if applicable.

Conditions and measures related to municipal sewage treatment plant

- In cases where applicable: default size, unless specified otherwise.

Conditions and measures related to external treatment of waste for disposal

- If any, all hazardous wastes are treated by certified contractors according to EU and national legislation.
- Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products
- Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according to the Waste regulation.

Conditions and measures related to external recovery of waste

- All residues are recycled or handled and conveyed according to waste legislation.

3.Exposure estimation (Environment ES-1)

No exposure assessment presented for the environment.

Additional information: See table 1 about summary of results for the local exposure assessment.

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

2. Conditions of use affecting exposure (Workers - Health ES-1)

Further specification

ZnSO₄ is used in the manufacture of preparations by mixing thoroughly the starting materials, followed by direct use or packaging of the preparation. Many different industrial uses are characterised by this process. Therefore these industrial uses are all covered by this generic exposure scenario.

Product characteristic

- The concentration of ZnSO₄ in the mixtures can cover a broad range (<= 5% up to >25%) depending on the application.
- The preparation can be solid or liquid.
- When the preparation is in solid state, it can be in a) powdery, b) glassy or c) pelletized form. In the powder form, it can be characterised by high dustiness in a worst case situation.

Amounts used

Max 5000T/y = 14T/d = 5T/shift depending on the application.

Frequency and duration of use/exposure

8 hour shifts (default worst case) are assumed as starting point; it is emphasised that the real duration of exposure could be less. This has to be considered when estimating exposure.

Human factors not influenced by risk management

Uncovered body parts: (potentially) face.

Other given operational conditions affecting workers exposure

- Elevated temperature steps (~=100°C) can occur
- All indoor processes in confined area.

Technical conditions and measures at process level (source) to prevent release

- Process enclosures and closed circuits where relevant and possible.
- Local exhaust ventilation on furnaces and other work areas with potential dust generation, dust capturing and removal techniques.
- Containment of liquid volumes in sumps to collect/prevent accidental spillage.

Technical conditions and measures to control dispersion from source towards the worker

- Local exhaust ventilation systems (high efficiency 90-95%).
- Cyclones/filters (for minimizing dust emissions) : efficiency: 70-90% (cyclones), 50-80% (dust filters), 85-95% (double stage, cassette filters).
- Process enclosure, especially in the drying /calcination / packaging (potentially dusty) units
- Dust control: dust and Zn in dust needs to be measured in the workplace air (static or individual) according to national regulations.
- Special care for the general establishment and maintenance of a clean working environment by e.g.:
 - Cleaning of process equipment and workshop.
- Storage of packaged Zn product in dedicated zones.

Organisational measures to prevent /limit releases, dispersion and exposure

Such management system would include general industrial hygiene practice e.g.:

- Information and training of workers on prevention of exposure/accidents,
- Procedures for control of personal exposure (hygiene measures)
- Regular cleaning of equipment and floors, extended workers instruction-manuals
- Procedures for process control and maintenance,...
- Personal protection measures (see below)

Conditions and measures related to personal protection, hygiene and health evaluation

Wearing of gloves and protective clothing is compulsory (efficiency >=90%).

With normal handling, no respiratory personal protection (breathing apparatus) is necessary. If risk for exceedance of OEL/DNEL, use e.g.:

- dust filter-half mask P1 (efficiency 75%)
- dust filter-half mask P2 (efficiency 90%)
- dust filter-half mask P3 (efficiency 95%)
- dust filter-full mask P1 (efficiency 75%)

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

-dust filter-full mask P2 (efficiency 90 %)

-dust filter-full mask P3 (efficiency 97.5%)

Eyes: safety glasses are optional

3.Exposure estimation (Health ES-1)

No exposure estimation presented for the human health.

Workers : There is a need for limiting the risks; risk reduction measures which are already being applied shall be taken into account.

Consumers: There is at present no need for further information and/or testing and for risk reduction measures beyond those which are being applied already.

Additional information: See table 2 about overview of conclusions with respect to occupational risk characterisation.

1.Title of exposure scenario– (2)

Main title	Industrial use of zinc chloride or ZnSO ₄ -formulations in the manufacturing of other inorganic or organic zinc substances in a solvent-based matrix with potentially filtering and packaging.
Product category	PC7 Base metals and alloys. PC14 Metal surface treatment products, including galvanic and electroplating products. PC19 Intermediate. PC20 Products such as ph-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals. PC24 Lubricants, greases and release products. PC29 Pharmaceuticals. PC39 Cosmetics, personal care.
Article category	AC2 Machinery, mechanical appliance, electrical/elektronic articles. AC7 Metal articles AC12-2 Constructional articles and building material for outdoor use: wall construction material, road surface material, ceramic, metal, plastic and wood construction material, insulating material.
Main sector	SU3 Industrial uses
Sector of use	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals SU10 Formulation [mixing] of preparations and/or re-packaging SU14 Manufacture of basic metals, including alloys SU15 Manufacture of fabricated metal products, except machinery and equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment.
Environment	
Environmental release category	ERC1 Manufacture of substances. ERC2 Formulation of preparations. ERC5 Industrial use resulting in inclusion into or onto a matrix. ERC6a Industrial use resulting in manufacture of another substance (use of intermediates).
Worker	
Process category	PROC1 Use in closed process, no likelihood of exposure. PROC2 Use in closed, continuous process with occasional controlled exposure. PROC3 Use in closed batch process (synthesis or formulation). PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing).

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

PROC13 Treatment of articles by dipping and pouring.

PROC15 Use as laboratory reagent.

PROC21 Low energy manipulation of substances bound in materials and/or articles

PROC22 Potentially closed processing operations with minerals/metals at elevated temperature.

Industrial setting.

PROC23 Open processing and transfer operations with minerals/metals at elevated temperature.

PROC26 Handling of solid inorganic substances at ambient temperature.

Further explanations (if needed)

ZnSO₄ is used as a starting material for the manufacturing of several other inorganic and organic zinc compounds. All the manufacturing processes are covered by the present scenario.

2. Conditions of use affecting exposure (Industrial - Environment ES-2)

Further specification

Description of activities/process(es) covered in the Exposure Scenario

- Reception of the ZnSO₄ or ZnSO₄-containing formulation, or ZnSO₄-bearing raw material in the reaction tank
- Sequential addition of reagents for purification steps and filtration on press filter, when needed (ventilation is adapted).
- Concentration by water evaporation, under exhaust hood, is optional.
- Possible pouring on a cooling belt, is optional as well
- Discharge and packaging of produced zinc compounds. Workers have to place and adjust the bag or drum under the discharge pipe and to set the process in motion. Filled bags or drums are subsequently closed and carried to the storage area.
- Exposure to dust can occur during packing of the powder. Solutions are packed in intermediate bulk containers (ca. 1 m³ capacity), solid products are packed in bags or drums.
- Maintenance activities
- For the specific process of electrogalvanising, which is covered by this scenario, the electrogalvanising bath consists of one or more tanks, usually made of a ceramic material, which contain zinc sulphate in solution. The steel passes through the bath and its surface is coated with zinc/iron-zinc alloys. Because of the speed of the strip (up to 180 m/min) and the short exposure time, the coating consists of a very thin layer.

Product characteristics

Zn-compounds are produced in their pure form e.g.: >99%, or in solution.

Amounts used

Up to 75 T/d of ZnSO₄ is transformed to equivalent Zn compound

Frequency and duration of use

Continuous production is assumed as a worst case. It is possible that use is not continuous; this has to be considered when estimating exposure.

Environment factors not influenced by risk management

Default for generic scenario: 18,000 m³/d, unless specified otherwise

Other given operational conditions affecting environmental exposure

- Wet processes (leaching, filtering, purification) followed by drying (possible grinding), and packaging;
- All indoor processes, in confined area.

Technical conditions and measures at process level (source) to prevent release

- Careful use of acids and corrosive solutions, if used.
- Sump containment is provided under the tanks and the filters i.o. to collect any accidental spillage.
- When applicable, process waters need to be specifically treated before release.
- Dosing and packaging operations occur under a special ventilation hood.
- Process air is filtered before release outside the building.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

- On-site waste water treatment techniques are (if applicable) e.g.: chemical precipitation, sedimentation, filtration (efficiency 90-99.98%).

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

- Containment of liquid volumes in sumps to collect/prevent accidental spillage
- Air emissions are controlled by use of bag-house filters and/or other air emission abatement devices e.g. fabric (or bag) filters (up to 99% efficiency), wet scrubbers (50-99% efficiency). This may create a general negative pressure in the building. Air emissions are continuously monitored.

Organizational measures to prevent/limit release from site

- In general emissions are controlled and prevented by implementing an integrated management system e.g. ISO 9000, ISO 1400X series, or alike, and, when applicable, by being IPPC-compliant. Such management system should include general industrial hygiene practice e.g.:
 - information and training of workers,
 - regular cleaning of equipment and floors,
 - procedures for process control and maintenance,...
- Treatment and monitoring of releases to outside air, and exhaust gas streams (process & hygiene), according to national regulation.
- SEVESO 2 compliance, if applicable.

Conditions and measures related to municipal sewage treatment plant

- In cases where applicable: default size, unless specified otherwise.

Conditions and measures related to external treatment of waste for disposal

- If any, all hazardous wastes are treated by certified contractors according to EU and national legislation.
- Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products
- Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.

Conditions and measures related to external recovery of waste

- All residues from the wet process are recycled.
- Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products
- Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.

3.Exposure estimation (Environment ES-2)

No exposure assessment presented for the environment.

Additional information: See table 1 about summary of results for the local exposure assessment.

2.Conditions of use affecting exposure (Workers - Health ES-2)

Product characteristic

- Zinc sulphate is transformed to equivalent pure zinc compound.
- The formed zinc compound can be produced as a powder with varying particle size (worst case scenario) or can be in solution.

Amounts used

Up to maximum 25T/shift

Frequency and duration of use/exposure

8 hrs shift (worst case)

Human factors not influenced by risk management

Uncovered body parts: (potentially) face.

Other given operational conditions affecting workers exposure

All processes are carried out indoor in confined areas.

Technical conditions and measures at process level (source) to prevent release

- Process enclosures or semi-enclosures where appropriate.

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

- Local exhaust ventilation on furnaces and other work areas with potential dust generation, dust capturing and removal techniques.
- Containment of liquid volumes in sumps to collect/prevent accidental spillage

Technical conditions and measures to control dispersion from source towards the worker

- Local exhaust ventilation systems (high efficiency 90-95%)
- Cyclones/filters (for minimizing dust emissions) : efficiency: 70-90% (cyclones), 50-80% (dust filters), 85-95% (double stage, cassette filters)
- Process enclosure, especially in the drying /calcination / packaging (potentially dusty) units
- Dust control: dust and Zn in dust needs to be measured in the workplace air (static or individual) according to national regulations.
- Special care for the general establishment and maintenance of a clean working environment by e.g.:
 - Cleaning of process equipment and workshop
- Storage of packaged Zn product in dedicated zones.

Organisational measures to prevent /limit releases, dispersion and exposure

Such management system would include general industrial hygiene practice e.g.:

- information and training of workers on prevention of exposure/accidents,
- procedures for control of personal exposure (hygiene measures)
- regular cleaning of equipment and floors, extended workers instruction-manuals
- procedures for process control and maintenance,...
- personal protection measures (see below)

Conditions and measures related to personal protection, hygiene and health evaluation

Wearing of gloves and protective clothing is compulsory (efficiency >=90%).

With normal handling, no respiratory personal protection (breathing apparatus) is necessary. If risk for exceedance of OEL/DNEL, use e.g.:

- dust filter-half mask P1 (efficiency 75%)
- dust filter-half mask P2 (efficiency 90%)
- dust filter-half mask P3 (efficiency 95%)
- dust filter-full mask P1 (efficiency 75%)
- dust filter-full mask P2 (efficiency 90 %)
- dust filter-full mask P3 (efficiency 97.5%)

Eyes: safety glasses are optional

3.Exposure estimation (Health ES-2)

No exposure estimation presented for the human health.

Workers : There is a need for limiting the risks; risk reduction measures which are already being applied shall be taken into account.

Consumers: There is at present no need for further information and/or testing and for risk reduction measures beyond those which are being applied already.

Additional information: See table 2 about overview of conclusions with respect to occupational risk characterisation.

1.Title of exposure scenario– (ES-3)

Main title	Industrial and professional use of ZnSO ₄ as active laboratory reagent in aqueous or organic media, for analysis or synthesis.
Product category	PC19 Intermediate. PC21 Laboratory chemicals. PC28 Perfumes, fragrances. PC39 Cosmetics, personal care.
Main sector	SU3 Industrial uses

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

Sector of use	SU10 Formulation [mixing] of preparations and/or re-packaging SU22 Professional use. SU24 Scientific research and development.
Environment Environmental release category	ERC1 Manufacture of substances. ERC2 Formulation of preparations. ERC4 Industrial use of processing aids in processes and products, not becoming part of articles. ERC6a Industrial use resulting in manufacture of another substance (use of intermediates). ERC6b Industrial use of reactive processing aids. ERC8a Wide dispersive indoor use of processing aids in open systems. ERC8b Wide dispersive indoor use of reactive substances in open systems. ERC8d Wide dispersive outdoor use of processing aids in open systems. ERC9a Wide dispersive indoor use of substances in closed systems.
Worker Process category	PROC1 Use in closed process, no likelihood of exposure. PROC2 Use in closed, continuous process with occasional controlled exposure. PROC3 Use in closed batch process (synthesis or formulation). PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises. PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC10 Roller application or brushing of adhesive and other coating. PROC15 Use as laboratory reagent.

2. Conditions of use affecting exposure (Industrial - Environment ES-3)

Further specification

The zinc sulphate is used for;

- Analysis: sample (solid or liquid) treatment or preparation: the substance is in the sample or in the reagents
- or synthesis: manipulations are usually under ventilation (e.g. laminar flow, ventilation hood).

The substance is used;

- at the industrial scale, in industrial installations for air control and water treatment.
- at the professional scale by laboratories.

Product characteristics

ZnSO₄ is used in minimum 80% purity; higher grades (>95%) are usual

Amounts used

Daily and annual amount per site:

maximum 5 T/y (industrial scale)

maximum 0.5 T/y (professional scale)

Frequency and duration of use

Use is usually intermittent but continuous use is assumed as a worst case. It is possible that use is not continuous; this has to be considered when estimating exposure.

Environment factors not influenced by risk management

If applicable: default for generic scenario: 18,000 m³/d, unless specified otherwise.

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

Other given operational conditions affecting environmental exposure

- All processes are performed indoor in a confined area, with dedicated laboratory equipment. All solid residues containing zinc are recovered for recycling.

Technical conditions and measures at process level (source) to prevent release

- Process enclosures and closed circuits where relevant.
- If relevant, dust capturing and removal techniques are applied on local exhaust ventilation (centralised treatment, scrubbers, filters,...)
- Containment of liquid volumes to collect waste streams.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

- At industrial scale, the waste waters will be treated in the on-site waste water treatment techniques that can be applied to prevent releases to water (if applicable) e.g.: chemical precipitation, sedimentation and filtration (efficiency 90-99.98%).
- At professional scale, the emissions are treated usually by STP. Professional services will be used for treating waste streams e.g. for the recovery of metallic solids (for recycling), and for the recovery of e.g. acid solutions containing the substance.
- Air emissions are controlled by use filters and/or other air emission abatement devices e.g. fabric (or bag) filters (up to 99% efficiency), wet scrubbers (50-99% efficiency). This may create a general negative pressure in the laboratory.

Organizational measures to prevent/limit release from site

- In general emissions are controlled and prevented by implementing an integrated management system e.g. ISO 9000, ISO 1400X series, or alike, and, when applicable, by being IPPC-compliant.
Such management system should include general industrial hygiene practice e.g.:
 - Information and training of workers,
 - Regular cleaning of equipment and floors,
 - Procedures for process control and maintenance,...
- Treatment and monitoring of releases to outside air, and exhaust gas streams (process & hygiene), according to national regulation.

Conditions and measures related to municipal sewage treatment plant

- In cases where applicable: default size, unless specified otherwise.

Conditions and measures related to external treatment of waste for disposal

- If any, all hazardous wastes are treated by certified contractors according to EU and national legislation.
- Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products.
- Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.

Conditions and measures related to external recovery of waste

- All residues are recycled or handled and conveyed according to waste legislation. .

3.Exposure estimation (Environment ES-3)

No exposure assessment presented for the environment.

Additional information: See table 1 about summary of results for the local exposure assessment.

2.Conditions of use affecting exposure (Workers - Health ES-3)

Product characteristic

- ZnSO₄ is used in minimum 80% purity; higher grades (>95%) are usual.
- The sample can be solid or liquid.
- When the preparation is in solid state, it can be in a) powdery, b) glassy or c) pelletized form. In the powder form, it can be characterised by high dustiness in a worst case situation.

Amounts used

maximum 5 T/y (industrial scale)

maximum 0.5 T/y (professional scale)

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

Frequency and duration of use/exposure

Use is usually intermittent but continuous use is assumed as a worst case. It is possible that use is not continuous; this has to be considered when estimating exposure.

Human factors not influenced by risk management

Uncovered body parts: (potentially) face.

Other given operational conditions affecting workers exposure

- High temperature steps can occur in protected zones (fume cupboards);
- All indoor processes in confined area, including hazardous substances cabinets.

Technical conditions and measures at process level (source) to prevent release

- Process enclosures and closed circuits where relevant and possible.
- Local exhaust ventilation on work areas with potential generation of dust or fumes, dust capturing and removal techniques (fume cupboards).
- Containment of liquid volumes and collection in special circuits

Technical conditions and measures to control dispersion from source towards the worker

- Local exhaust ventilation systems are provided where needed on the benches and in the fume cupboards.
- Process enclosures if relevant.
- Dust control: dust to be measured in the workplace air according to national regulations.
- Special care for the general establishment and maintenance of a clean working environment by e.g.:
 - Cleaning of process equipment and laboratory.
- Storage of Zn products in dedicated zones, e.g.: hazardous substances cabinets.

Organisational measures to prevent /limit releases, dispersion and exposure

Such management system would include general industrial hygiene practice e.g.:

- Information and training of workers on prevention of exposure/accidents,
- Procedures for control of personal exposure (hygiene measures)
- Regular cleaning of equipment and floors, extended workers instruction-manuals
- Procedures for process control and maintenance,...
- Personal protection measures (see below)

Conditions and measures related to personal protection, hygiene and health evaluation

Wearing of gloves and protective clothing is compulsory (efficiency $\geq 90\%$).

With normal handling, no respiratory personal protection (breathing apparatus) is necessary. If risk for exceedance of OEL/DNEL, use e.g.:

- dust filter-half mask P1 (efficiency 75%)
- dust filter-half mask P2 (efficiency 90%)
- dust filter-half mask P3 (efficiency 95%)
- dust filter-full mask P1 (efficiency 75%)
- dust filter-full mask P2 (efficiency 90 %)
- dust filter-full mask P3 (efficiency 97.5%)

Eyes: safety glasses are optional but usually taken as "normal laboratory practice"

3.Exposure estimation (Health ES-3)

No exposure estimation presented for the human health.

Workers : There is a need for limiting the risks; risk reduction measures which are already being applied shall be taken into account.

Consumers: There is at present no need for further information and/or testing and for risk reduction measures beyond those which are being applied already.

Additional information: See table 2 about overview of conclusions with respect to occupational risk characterisation.

1.Title of exposure scenario– (4)

Main title

Industrial use of ZnSO₄ or ZnSO₄-formulations as component for the manufacture of solid blends and matrices for further downstream use.

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

Product category	<p>PC1 Adhesives, sealants.</p> <p>PC8 Biocidal products.</p> <p>PC9a Coatings and paints, thinners, paint removers.</p> <p>PC9b Fillers, putties, plasters, modelling clay.</p> <p>PC9c Finger paints.</p> <p>PC12 Lawn and garden preparations (- fertilizers).</p> <p>PC14 Metal surface treatment products, including galvanic and electroplating products.</p> <p>PC15 Non-metal-surface treatment products.</p> <p>PC18 Ink and toners.</p> <p>PC20 Products such as ph-regulators, flocculants, precipitants, neutralization agents</p> <p>PC21 Laboratory chemicals.</p> <p>PC26 Paper and board dye, finishing and impregnation products, including bleaches and other processing aids.</p> <p>PC28 Perfumes, fragrances.</p> <p>PC29 Pharmaceuticals.</p> <p>PC32 Polymer preparations and compounds.</p> <p>PC35 Washing and cleaning products (including solvent-based products).</p> <p>PC37 Water treatment chemicals.</p> <p>PC39 Cosmetics, personal care.</p>
Main sector	SU3 Industrial uses
Sector of use	<p>SU1 Agriculture, forestry, fishery.</p> <p>SU4 Manufacture of food products</p> <p>SU5 Manufacture of textiles, leather, fur</p> <p>SU8 Manufacture of bulk, large-scale chemicals (including petroleum products)</p> <p>SU9 Manufacture of fine chemicals</p> <p>SU10 Formulation [mixing] of preparations and/or re-packaging</p> <p>SU11 Manufacture of rubber products</p> <p>SU12 Manufacture of plastics products, including compounding and conversion</p> <p>SU13 Manufacture of other non-metallic mineral products</p> <p>SU14 Manufacture of basic metals, including alloys</p> <p>SU20 Health services</p>
<u>Environment</u> Environmental release category	<p>ERC1 Manufacture of substances.</p> <p>ERC2 Formulation of preparations.</p> <p>ERC3 Formulation in materials.</p> <p>ERC4 Industrial use of processing aids in processes and products, not becoming part of articles.</p> <p>ERC5 Industrial use resulting in inclusion into or onto a matrix.</p> <p>ERC7 Industrial use of substances in closed systems.</p> <p>ERC8a Wide dispersive indoor use of processing aids in open systems.</p> <p>ERC8b Wide dispersive indoor use of reactive substances in open systems.</p> <p>ERC8d Wide dispersive outdoor use of processing aids in open systems.</p> <p>ERC10a Wide dispersive outdoor use of long-life articles and materials with low release.</p> <p>ERC10b Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing).</p>
<u>Worker</u> Process category	<p>PROC1 Use in closed process, no likelihood of exposure.</p> <p>PROC2 Use in closed, continuous process with occasional controlled exposure.</p> <p>PROC3 Use in closed batch process (synthesis or formulation).</p> <p>PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises.</p> <p>PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).</p>

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing).

PROC13 Treatment of articles by dipping and pouring.

PROC14 Production of preparations or articles by tableting, compression, extrusion, pelletisation.

PROC15 Use as laboratory reagent.

PROC22 Potentially closed processing operations with minerals/metals at elevated temperature. Industrial setting.

Further explanations (if needed)

ZnSO₄ or ZnSO₄-containing preparations are used in the manufacture of dry preparations by mixing thoroughly the starting materials, possibly followed by pressing or pelletizing, and finally packaging of the preparation.

2. Conditions of use affecting exposure (Industrial - Environment ES-4)

Further specification

In the described process, the ZnSO₄ (or Zn compound) containing preparation/mixture is optionally:

- Pressed at high temperature (>1000°C), grinded and re-pressed or fritted at high temperature.
- Molten at high temperature (>500°C) and further cast as glassy material.
- Pressed and pelletized at low temperature.

And subsequently packed, or used as such, in further treatment/use.

Product characteristics

ZnSO₄ (or Zn compound) in the preparation can be > 25%, usually <5%

Amounts used

maximum 5000 T/y;

Frequency and duration of use

Continuous production is assumed as a worst case. It is possible that use is not continuous; this has to be considered when estimating exposure.

Environment factors not influenced by risk management

default for generic scenario: 18,000 m³/d, unless specified otherwise

Other given operational conditions affecting environmental exposure

- All dry processes throughout, no process waters. Even when no process waters occur (with dry process throughout), some non-process water can be generated containing zinc (e.g. from cleaning)
- High temperature steps are possible.
- All processes are performed indoor in a confined area. All residues containing zinc are recycled.

Technical conditions and measures at process level (source) to prevent release

- Local exhaust ventilation on furnaces and other work areas with potential dust generation.
- Dust capturing and removal techniques are applied.
- Process enclosures where relevant and possible.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

- No process waters, so possible emissions to water are limited and non-process related.
- On-site waste water treatment techniques can be applied to prevent releases to water (if applicable) e.g.: chemical precipitation, sedimentation and filtration (efficiency 90-99.98%).
- Air emissions are controlled by use of bag-house filters and/or other air emission abatement devices e.g. fabric or bag filters, wet scrubbers. This may create a general negative pressure in the building.

Organizational measures to prevent/limit release from site

- In general emissions are controlled and prevented by implementing an integrated management system e.g. ISO 9000, ISO 1400X series, or alike, and, when applicable, by being IPPC-compliant.

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

Such management system should include general industrial hygiene practice e.g.:

- information and training of workers,
- regular cleaning of equipment and floors,
- procedures for process control and maintenance,...
- Treatment and monitoring of releases to outside air, and exhaust gas streams (process & hygiene), according to national regulation.
- SEVESO 2 compliance, if applicable.

Conditions and measures related to municipal sewage treatment plant

- In cases where applicable: default size, unless specified otherwise.

Conditions and measures related to external treatment of waste for disposal

- If any, all hazardous wastes are treated by certified contractors according to EU and national legislation.
- Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products.
- Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.

Conditions and measures related to external recovery of waste

- All residues are recycled or handled and conveyed according to waste legislation. .

3.Exposure estimation (Environment ES-4)

No exposure assessment presented for the environment.

Additional information: See table 1 about summary of results for the local exposure assessment.

2.Conditions of use affecting exposure (Workers - Health ES-4)

Product characteristic

- The concentration of ZnSO₄ in the mixtures can be up to >25% but is usually of the order of ≤ 5%, depending on the application.
- A particle size distribution for the ZnSO₄ - heptahydrate shows a very coarse product (mean diameter > 500 μ, 99% > 100 μ), while the monohydrate has a broad particle size distribution with a mean diameter of 170 μ, 14% < 10 μ and 6% < 5 μ (RA ZnSO₄).
- A study of dustiness, using the modified Heubach method, that includes a multi-stage impactor to separate different aerosol fractions, shows a total dustiness of 26.7 mg/g for monohydrate and 0.25 for hexahydrate. For monohydrate 92.11 % of the generated dust is larger than 8.13 μm and 79.85 % larger than 15.8 μm. For hexahydrate 97.02 % of the generated dust is larger than 8.13 μm and 85.01 % larger than 15.8 μm. For comparison, the total dustiness of zinc oxide is 30 mg/g with 84.53% larger than 8.13 μm and 73.92 % larger than 15.8 μm (Deutsche Montan Technologie GmbH, 2000).
- The preparation is in the solid state, usually with a low level of dustiness; however, powder forms can occur, the high dustiness is therefore applied as a worst case.

Amounts used

Max 5000T/y = 15T/d = 5T/shift depending of application.

Frequency and duration of use/exposure

8 hour shifts (default worst case) are assumed as starting point; it is emphasised that the real duration of exposure could be less. This has to be considered when estimating exposure.

Human factors not influenced by risk management

Uncovered body parts: (potentially) face.

Other given operational conditions affecting workers exposure

- Dry processes: dry operational conditions throughout the process; no process waters;
- High temperature steps can occur;
- Indoor processes in confined area.

Technical conditions and measures at process level (source) to prevent release

- Local exhaust ventilation on furnaces and other work areas with potential dust generation, dust capturing and removal techniques.

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

- Process enclosures where appropriate.

Technical conditions and measures to control dispersion from source towards the worker

- Local exhaust ventilation systems and process enclosures are generally applied.
- Cyclones/filters (for minimizing dust emissions): efficiency 70%-90% (cyclones); dust filters (50- 80%).
- LEV in work area: efficiency 84% (generic LEV).

Organisational measures to prevent /limit releases, dispersion and exposure

In general integrated management systems are implemented at the workplace e.g. ISO 9000, ISO-ICS 13100, or alike, and are, when appropriate, IPPC-compliant.

Such management system would include general industrial hygiene practice e.g.:

- Information and training of workers on prevention of exposure/accidents,
- Procedures for control of personal exposure (hygiene measures)
- Regular cleaning of equipment and floors, extended workers instruction-manuals
- Procedures for process control and maintenance,...
- personal protection measures (see below)

Conditions and measures related to personal protection, hygiene and health evaluation

Wearing of gloves and protective clothing is compulsory (efficiency $\geq 90\%$).

With normal handling, no respiratory personal protection (breathing apparatus) is necessary. If risk for exceedance of OEL/DNEL, use e.g.:

- dust filter-half mask P1 (efficiency 75%)
- dust filter-half mask P2 (efficiency 90%)
- dust filter-half mask P3 (efficiency 95%)
- dust filter-full mask P1 (efficiency 75%)
- dust filter-full mask P2 (efficiency 90 %)
- dust filter-full mask P3 (efficiency 97.5%)

Eyes: safety glasses are optional

3.Exposure estimation (Health ES-4)

No exposure estimation presented for the human health.

Workers : There is a need for limiting the risks; risk reduction measures which are already being applied shall be taken into account.

Consumers: There is at present no need for further information and/or testing and for risk reduction measures beyond those which are being applied already.

Additional information: See table 2 about overview of conclusions with respect to occupational risk characterisation.

1.Title of exposure scenario– (5)

Main title	Industrial use of ZnSO ₄ or ZnSO ₄ -formulations as component for the manufacture of dispersions, pastes or other viscous or polymerized matrices.
Product category	PC2 Adsorbents. PC8 Biocidal products. PC9a Coatings and paints, thinners, paint removers. PC9b Fillers, putties, plasters, modelling clay. PC12 Lawn and garden preparations (- fertilizers). PC14 Metal surface treatment products, including galvanic and electroplating products. PC15 Non-metal-surface treatment products. PC18 Ink and toners. PC19 Intermediate. PC20 Products such as ph-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals. PC23 Leather tanning, dye, finishing, impregnation and care products. PC24 Lubricants, greases and release products. PC25 Metal working fluids.

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

	<p>PC28 Perfumes, fragrances. PC29 Pharmaceuticals. PC32 Polymer preparations and compounds. PC34 Textile dyes, finishing and impregnating products, including bleaches and other processing aids. PC35 Washing and cleaning products (including solvent-based products). PC39 Cosmetics, person. PC40 Extraction agents.</p>
Article category	<p>AC1 Vehicles AC2 Machinery, mechanical appliances, electrical/electronic articles AC7 Metal articles</p>
Main sector	<p>SU3 Industrial uses</p>
Sector of use	<p>SU4 Manufacture of food products SU5 Manufacture of textiles, leather, fur SU6b Manufacture of pulp, paper and paper products SU7 Printing and reproduction of recorded media SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals SU10 Formulation [mixing] of preparations and/or re-packaging SU18 Manufacture of furniture SU20 Health services.</p>
<u>Environment</u> Environmental release category	<p>ERC1 Manufacture of substances. ERC2 Formulation of preparations. ERC3 Formulation in materials. ERC4 Industrial use of processing aids in processes and products, not becoming part of articles. ERC5 Industrial use resulting in inclusion into or onto a matrix. ERC6a Industrial use resulting in manufacture of another substance (use of intermediates). ERC6b Industrial use of reactive processing aids. ERC6d Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers. ERC8a Wide dispersive indoor use of processing aids in open systems. ERC8b Wide dispersive indoor use of reactive substances in open systems. ERC8d Wide dispersive outdoor use of processing aids in open systems. ERC9a Wide dispersive indoor use of substances in closed systems. ERC9b Wide dispersive outdoor use of substances in closed systems. ERC10a Wide dispersive outdoor use of long-life articles and materials with low release. ERC10b Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing). ERC11a Wide dispersive indoor use of long-life articles and materials with low release.</p>
<u>Worker</u> Process category	<p>PROC1 Use in closed process, no likelihood of exposure. PROC2 Use in closed, continuous process with occasional controlled exposure. PROC3 Use in closed batch process (synthesis or formulation). PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises. PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC6 Calendering operations. PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.</p>

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Zinc Sulphate

PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing).

PROC10 Roller application or brushing of adhesive and other coating.

PROC13 Treatment of articles by dipping and pouring.

PROC14 Production of preparations or articles by tableting, compression, extrusion, pelletisation.

PROC15 Use as laboratory reagent.

2. Conditions of use affecting exposure (Industrial - Environment ES-5)

Further specification

In the described process, the zinc sulphate containing preparation/mixture is:

- Unpacked and stored in silos
- Extracted from the silo, dosed and fed with the other reagents and/or solvents to the mixing tank, batchwise or continuously, according to the process receipt.
- The resulting zinc salt containing mixture (solution, dispersion, paste) is directly further processed, or packed, for further treatment/use.

Product characteristics

ZnSO₄ in preparation can be > 25%

Amounts used

maximum 5000 T/y;

Frequency and duration of use

Continuous production is assumed as a worst case. It is possible that use is not continuous; this has to be considered when estimating exposure.

Environment factors not influenced by risk management

default for generic scenario: 18,000 m³/d, unless specified otherwise

Other given operational conditions affecting environmental exposure

- In parallel, non-process water can be generated containing zinc (e.g. from cleaning)
- All processes are performed indoor in a confined area.
- All residues containing zinc are recycled.

Technical conditions and measures at process level (source) to prevent release

- Local exhaust ventilation on furnaces and other work areas with potential dust generation.
- Dust capturing and removal techniques are applied.
- Process enclosures where relevant and possible.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

- Most of the operations imply wet process-steps
- Sump containment is provided under the tanks and the filters i.o. to collect any accidental spillage
- On-site waste water treatment techniques can be applied to prevent releases to water (if applicable) e.g.: chemical precipitation, sedimentation and filtration (efficiency 90-99.98%).
- Air emissions are controlled by use of bag-house filters and/or other air emission abatement devices e.g. fabric or bag filters, wet scrubbers. This may create a general negative pressure in the building.

Organizational measures to prevent/limit release from site

- In general emissions are controlled and prevented by implementing an integrated management system e.g. ISO 9000, ISO 1400X series, or alike, and, when applicable, by being IPPC-compliant.
Such management system should include general industrial hygiene practice e.g.:
 - information and training of workers,
 - regular cleaning of equipment and floors,
 - procedures for process control and maintenance,...
- Treatment and monitoring of releases to outside air, and exhaust gas streams (process & hygiene), according to national regulation.
- SEVESO 2 compliance, if applicable.

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

Conditions and measures related to municipal sewage treatment plant

- In cases where applicable: default size, unless specified otherwise.

Conditions and measures related to external treatment of waste for disposal

- If any, all hazardous wastes are treated by certified contractors according to EU and national legislation.
- Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products
- Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.

Conditions and measures related to external recovery of waste

- All residues are recycled or handled and conveyed according to waste legislation.

3.Exposure estimation (Environment ES-5)

No exposure assessment presented for the environment.

Additional information: See table 1 about summary of results for the local exposure assessment.

2.Conditions of use affecting exposure (Workers - Health ES-5)

Product characteristic

- The concentration of ZnSO₄ in the mixtures can be up to >25% but is usually of the order of ≤ 5%, depending on the application.
- A particle size distribution for the ZnSO₄ - heptahydrate shows a very coarse product (mean diameter > 500 μ, 99% > 100 μ), while the monohydrate has a broad particle size distribution with a mean diameter of 170 μ, 14% < 10 μ and 6% < 5 μ (RA ZnSO₄).
- A study of dustiness, using the modified Heubach method, that includes a multi-stage impactor to separate different aerosol fractions, shows a total dustiness of 26.7 mg/g for monohydrate and 0.25 for hexahydrate. For monohydrate 92.11 % of the generated dust is larger than 8.13 μm and 79.85 % larger than 15.8 μm. For hexahydrate 97.02 % of the generated dust is larger than 8.13 μm and 85.01 % larger than 15.8 μm. For comparison, the total dustiness of zinc oxide is 30 mg/g with 84.53% larger than 8.13 μm and 73.92 % larger than 15.8 μm (Deutsche Montan Technologie GmbH, 2000).
- The preparation is in the solid state, usually with a low level of dustiness; however, powder forms can occur, the high dustiness is therefore applied as a worst case.

Amounts used

Max 5000T/y = 20 T/d = 7 T/shift depending of application.

Frequency and duration of use/exposure

8 hour shifts (default worst case) are assumed as starting point; it is emphasised that the real duration of exposure could be less. This has to be considered when estimating exposure.

Human factors not influenced by risk management

Uncovered body parts: (potentially) face.

Other given operational conditions affecting workers exposure

- Wet processes.
- All indoor processes in confined area.

Technical conditions and measures at process level (source) to prevent release

- Local exhaust ventilation on furnaces and other work areas with potential dust generation, dust capturing and removal techniques.
- Process enclosures where appropriate.

Technical conditions and measures to control dispersion from source towards the worker

- Local exhaust ventilation systems and process enclosures are generally applied
- Cyclones/filters (for minimizing dust emissions): efficiency 70%-90% (cyclones); dust filters (50- 80%)
- LEV in work area: efficiency 84% (generic LEV)

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

Organisational measures to prevent /limit releases, dispersion and exposure

In general integrated management systems are implemented at the workplace e.g. ISO 9000, ISO-ICS 13100, or alike, and are, when appropriate, IPPC-compliant.

Such management system would include general industrial hygiene practice e.g.:

- Information and training of workers on prevention of exposure/accidents,
- Procedures for control of personal exposure (hygiene measures)
- Regular cleaning of equipment and floors, extended workers instruction-manuals
- Procedures for process control and maintenance,...
- Personal protection measures (see below)

Conditions and measures related to personal protection, hygiene and health evaluation

Wearing of gloves and protective clothing is compulsory (efficiency >=90%).

With normal handling, no respiratory personal protection (breathing apparatus) is necessary. If risk for exceedance of OEL/DNEL, use e.g.:

- dust filter-half mask P1 (efficiency 75%)
- dust filter-half mask P2 (efficiency 90%)
- dust filter-half mask P3 (efficiency 95%)
- dust filter-full mask P1 (efficiency 75%)
- dust filter-full mask P2 (efficiency 90 %)
- dust filter-full mask P3 (efficiency 97.5%)

In particular, when PROC 7, 11, 19 are involved, respiratory protection is recommended

Eyes: safety glasses are optional

3.Exposure estimation (Health ES-5)

No exposure estimation presented for the human health.

Workers : There is a need for limiting the risks; risk reduction measures which are already being applied shall be taken into account.

Consumers: There is at present no need for further information and/or testing and for risk reduction measures beyond those which are being applied already.

Additional information: See table 2 about overview of conclusions with respect to occupational risk characterisation.

1.Title of exposure scenario– (6)

Main title	Industrial and professional use of solid substrates containing less than 25%w/w of ZnSO4.
Product category	PC1 Adhesives, sealents. PC8 Biocidal products. PC9a Coatings and paints, thinners, paint removers. PC9b Fillers, putties, plasters, modelling clay. PC9c Finger paints. PC14 Metal surface treatment products, including galvanic and electroplating products. PC15 Non-metal-surface treatment products. PC18 Ink and toners. PC20 Products such as ph-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals. PC28 Perfumes, fragrances. PC29 Pharmaceuticals. PC35 Washing and cleaning products (including solvent-based products). PC39 Cosmetics, person.
Main sector	SU3 Industrial uses SU22 Professional use.
Sector of use	SU5 Manufacture of textiles, leather, fur SU6b Manufacture of pulp, paper and paper products

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

SU9 Manufacture of fine chemicals
SU10 Formulation [mixing] of preparations and/or re-packaging

Environment

Environmental release category

ERC8a Wide dispersive indoor use of processing aids in open systems.
ERC8d Wide dispersive outdoor use of processing aids in open systems.
ERC10a Wide dispersive outdoor use of long-life articles and materials with low release.
ERC11a Wide dispersive indoor use of long-life articles and materials with low release.

Worker

Process category

PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises.
PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
PROC6 Calendring operations.
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing).
PROC10 Roller application or brushing of adhesive and other coating.
PROC11 Spraying outside industrial settings and/or applications.
PROC13 Treatment of articles by dipping and pouring.
PROC19 Hand-mixing with intimate contact and only PPE available.

2. Conditions of use affecting exposure (Industrial - Environment ES-6)

Further specification

This scenario covers both the industrial scale processes and professional use. In the described process, the ZnSO₄ containing preparation/mixture is further processed, involving potentially the following steps:

- Reception/unpacking of material.
- Final application, embedding, or shaping to produce the end product or article.

Product characteristics

ZnSO₄ (or Zn compound) in the article is < 25%

Amounts used

- The quantities involved in this scenario are 10-50 times smaller than in blending (ES 4-ES 5); the concentration of the zinc substance is also lower (<25%).
- Typical quantities for both Industrial and professional are 50T/y (typical), maximum 500T/y (in industrial setting).

Frequency and duration of use

Continuous production is assumed as a worst case. It is possible that use is not continuous; this has to be considered when estimating exposure.

Environment factors not influenced by risk management

default for generic scenario: 18,000 m³/d, unless specified otherwise

Other given operational conditions affecting environmental exposure

- Solid, so in principle all dry processes throughout, no process waters. Even when no process waters occur (with dry process throughout), some non-process water can be generated containing zinc (e.g. from cleaning).
- In industrial and professional setting, all processes are performed indoor in a confined area. All residues containing zinc are recycled.

Technical conditions and measures at process level (source) to prevent release

In industrial and professional setting the following applies:

- Local exhaust ventilation on furnaces and other work areas with potential dust generation.
- Dust capturing and removal techniques are applied.
- Process enclosures where relevant and possible.

ANNEX I- EXPOSURE SCENARIO

Zinc Sulphate

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

In industrial and professional setting, the following applies:

- No process waters, so possible emissions to water are limited and non-process related.
- If zinc emissions to water, on-site waste water treatment techniques can be applied to prevent releases to water (if applicable) e.g.: chemical precipitation, sedimentation and filtration (efficiency 90-99.98%).
 - By exposure modelling it is predicted that at use quantities of >100T/y, refinement of the exposure assessment to water and sediment needs to be made (exposure assessment based on real measured data and local parameters). Treatment of the emissions to water may be needed under such conditions (see “exposure estimation and risk characterisation”).
 - Air emissions are controlled by use of bag-house filters and/or other air emission abatement devices e.g. fabric or bag filters, wet scrubbers. This may create a general negative pressure in the building.

Organizational measures to prevent/limit release from site

- In general emissions are controlled and prevented by implementing an integrated management system e.g. ISO 9000, ISO 1400X series, or alike, and, when applicable, by being IPPC-compliant.
 - Such management system should include general industrial hygiene practice e.g.:
 - Information and training of workers,
 - Regular cleaning of equipment and floors,
 - Procedures for process control and maintenance,...
- Treatment and monitoring of releases to outside air, and exhaust gas streams (process & hygiene), according to national regulation.
- SEVESO 2 compliance, if applicable.

Conditions and measures related to municipal sewage treatment plant

- In cases where applicable: default size, unless specified otherwise.

Conditions and measures related to external treatment of waste for disposal

- If any, all hazardous wastes are treated by certified contractors according to EU and national legislation.
- Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products
- Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.

Conditions and measures related to external recovery of waste

- All residues are recycled or handled and conveyed according to waste legislation.

3.Exposure estimation (Environment ES-6)

No exposure assessment presented for the environment.

Additional information: See table 1 about summary of results for the local exposure assessment.

2.Conditions of use affecting exposure (Workers - Health ES-6)

Product characteristic

The concentration of ZnSO₄ (or Zn compound) in the mixture is < 25%

- The mixture is in the solid state, with a low level of dustiness; however, powder forms can occur, the medium dustiness is therefore applied as a worst case.

Amounts used

- The quantities involved in this scenario are 10-50 times smaller than in blending (ES 4-ES 5); the concentration of the zinc substance is also lower (<25%).
- Typical quantities for both Industrial and professional are 50 T/y (typical), or 0.15 T/day, 0.05 T/shift
- maximum use quantity is 500T/y (1.5T/d, 0.5T/shift) in industrial setting.

Frequency and duration of use/exposure

8 hour shifts (default worst case) are assumed as starting point; it is emphasised that the real duration of exposure could be less. This has to be considered when estimating exposure.

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Human factors not influenced by risk management

Uncovered body parts: (potentially) face.

Other given operational conditions affecting workers exposure

- Industrial / Professional:
 - Dry processes: dry operational conditions throughout the process; no process waters;
 - indoor processes in confined area.

Technical conditions and measures at process level (source) to prevent release

- Industrial /professional:
 - Local exhaust ventilation on work areas with potential dust generation, dust capturing and removal techniques.
 - Process enclosures where appropriate.

Technical conditions and measures to control dispersion from source towards the worker

- Industrial / Professional:
 - Local exhaust ventilation systems and process enclosures are generally applied
 - Cyclones/filters (for minimizing dust emissions): efficiency 70%-90% (cyclones); dust filters (50- 80%).
 - LEV in work area: efficiency 84% (generic LEV).

Organisational measures to prevent /limit releases, dispersion and exposure

Such management system would include general industrial hygiene practice e.g.:

- Information and training of workers on prevention of exposure/accidents,
- Procedures for control of personal exposure (hygiene measures)
- Regular cleaning of equipment and floors, extended workers instruction-manuals
- Procedures for process control and maintenance,...
- Personal protection measures (see below)

Conditions and measures related to personal protection, hygiene and health evaluation

Wearing of gloves and protective clothing is compulsory (efficiency $\geq 90\%$).

With normal handling, no respiratory personal protection (breathing apparatus) is necessary. If risk for exceedance of OEL/DNEL, use e.g.:

- dust filter-half mask P1 (efficiency 75%)
- dust filter-half mask P2 (efficiency 90%)
- dust filter-half mask P3 (efficiency 95%)
- dust filter-full mask P1 (efficiency 75%)
- dust filter-full mask P2 (efficiency 90 %)
- dust filter-full mask P3 (efficiency 97.5%)

Eyes: safety glasses are optional

3.Exposure estimation (Health ES-6)

No exposure estimation presented for the human health.

Workers : There is a need for limiting the risks; risk reduction measures which are already being applied shall be taken into account.

Consumers: There is at present no need for further information and/or testing and for risk reduction measures beyond those which are being applied already.

Additional information: See table 2 about overview of conclusions with respect to occupational risk characterisation.

1.Title of exposure scenario– (7)

Main title	Industrial and professional use of dispersions, pastes and polymerised substrates containing less than 25%w/w of ZnSO ₄ .
Product category	PC8 Biocidal products. PC20 Products such as ph-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals. PC28 Perfumes, fragrances.

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	PC29 Pharmaceuticals. PC35 Washing and cleaning products (including solvent-based products). PC39 Cosmetics, person.
Main sector	SU22 Professional use.
Sector of use	SU9 Manufacture of fine chemicals SU20 Health services.
<u>Environment</u>	
Environmental release category	ERC8a Wide dispersive indoor use of processing aids in open systems.
<u>Worker</u>	
Process category	PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC10 Roller application or brushing of adhesive and other coating. PROC11 Spraying outside industrial settings and/or applications. PROC13 Treatment of articles by dipping and pouring.

2. Conditions of use affecting exposure (Industrial - Environment ES-7)

Further specification

This scenario covers both the industrial scale processes and professional use. In the described process, the ZnSO₄ containing preparation/mixture is further processed, involving potentially the following steps:

- Reception/unpacking of material.
- Final application, embedding, or shaping to produce the end product or article.

Product characteristics

ZnSO₄ (or Zn compound) in the article is < 25%

Amounts used

- The quantities involved in this scenario are 10-50 times smaller than in blending (ES 4-ES 5); the concentration of the zinc substance is also lower (<25%).
- Typical quantities for both Industrial and professional are 50T/y (typical), maximum 500T/y (in industrial setting).

Frequency and duration of use

Continuous production is assumed as a worst case. It is possible that use is not continuous; this has to be considered when estimating exposure.

Environment factors not influenced by risk management

Default for generic scenario: 18,000 m³/d, unless specified otherwise.

Other given operational conditions affecting environmental exposure

- Wet processes. All process and non-process waters should be recycled internally to a maximal extent.
- Even when no process waters occur, some non-process water can be generated containing zinc (e.g. from cleaning)
- In industrial and professional setting, all processes are performed in a confined area. All residues containing zinc are recycled.

Technical conditions and measures at process level (source) to prevent release

In industrial and professional setting the following applies:

- Process enclosures where relevant and possible
- Local exhaust ventilation on furnaces and other work areas with potential dust generation.
- Dust capturing and removal techniques are applied.
- Containment of liquid volumes in sumps to collect/prevent accidental spillage

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

In industrial and professional setting, the following applies:

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- No process waters, so possible emissions to water are limited and non-process related.
- If zinc emissions to water, on-site waste water treatment techniques can be applied to prevent releases to water (if applicable) e.g.: chemical precipitation, sedimentation and filtration (efficiency 90-99.98%).
 - By exposure modelling it is predicted that at use quantities of >100T/y, refinement of the exposure assessment to water and sediment needs to be made (exposure assessment based on real measured data and local parameters). Treatment of the emissions to water may be needed under such conditions (see “exposure estimation and risk characterisation”).
 - Air emissions are controlled by use of bag-house filters and/or other air emission abatement devices e.g. fabric or bag filters, wet scrubbers. This may create a general negative pressure in the building.

Organizational measures to prevent/limit release from site

- In general emissions are controlled and prevented by implementing an integrated management system e.g. ISO 9000, ISO 1400X series, or alike, and, when applicable, by being IPPC-compliant. Such management system should include general industrial hygiene practice e.g.:
 - Information and training of workers,
 - Regular cleaning of equipment and floors,
 - Procedures for process control and maintenance,...
- Treatment and monitoring of releases to outside air, and exhaust gas streams (process & hygiene), according to national regulation.
- SEVESO 2 compliance, if applicable.

Conditions and measures related to municipal sewage treatment plant

- In cases where applicable: default size, unless specified otherwise.

Conditions and measures related to external treatment of waste for disposal

- If any, all hazardous wastes are treated by certified contractors according to EU and national legislation.
- Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products
- Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.

Conditions and measures related to external recovery of waste

- All residues are recycled or handled and conveyed according to waste legislation. .

3.Exposure estimation (Environment ES-7)

No exposure assessment presented for the environment.

Additional information: See table 1 about summary of results for the local exposure assessment.

2.Conditions of use affecting exposure (Workers - Health ES-7)

Product characteristic

The concentration of ZnSO₄ (or Zn compound) in the mixture is < 25%

- Particles can occur sporadically, the low level of dustiness is basically applied.
- Most of the processes imply the use of solutions or pastes; the “solution status” is therefore taken as the worst case.

Amounts used

- The quantities involved in this scenario are 10-50 times smaller than in blending (ES 4-ES 5); the concentration of the zinc substance is also lower (<25%).
- Typical quantities for both Industrial and professional are 50 T/y (typical), or 0.15 T/day, 0.05 T/shift
- Maximum use quantity is 500T/y (1.5T/d, 0.5T/shift) in industrial setting.

Frequency and duration of use/exposure

8 hour shifts (default worst case) are assumed as starting point; it is emphasised that the real duration of exposure could be less. This has to be considered when estimating exposure.

Human factors not influenced by risk management

Uncovered body parts: (potentially) face.

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Other given operational conditions affecting workers exposure

- Industrial / Professional:
 - Wet processes, all indoor in confined area.

Technical conditions and measures at process level (source) to prevent release

- Industrial /professional:
 - Local exhaust ventilation on work areas with potential dust generation, dust capturing and removal techniques
 - Process enclosures where appropriate

Technical conditions and measures to control dispersion from source towards the worker

- Industrial / Professional:
 - Local exhaust ventilation systems and process enclosures are generally applied
 - Cyclones/filters (for minimizing dust emissions): efficiency 70%-90% (cyclones); dust filters (50- 80%).
 - LEV in work area: efficiency 84% (generic LEV).

Organisational measures to prevent /limit releases, dispersion and exposure

Such management system would include general industrial hygiene practice e.g.:

- Information and training of workers on prevention of exposure/accidents,
- Procedures for control of personal exposure (hygiene measures)
- Regular cleaning of equipment and floors, extended workers instruction-manuals
- Procedures for process control and maintenance,...
- Personal protection measures (see below)

Conditions and measures related to personal protection, hygiene and health evaluation

Wearing of gloves and protective clothing is compulsory (efficiency $\geq 90\%$).

With normal handling, no respiratory personal protection (breathing apparatus) is necessary. If risk for exceedance of OEL/DNEL, use e.g.:

- dust filter-half mask P1 (efficiency 75%)
- dust filter-half mask P2 (efficiency 90%)
- dust filter-half mask P3 (efficiency 95%)
- dust filter-full mask P1 (efficiency 75%)
- dust filter-full mask P2 (efficiency 90 %)
- dust filter-full mask P3 (efficiency 97.5%)

Eyes: safety glasses are optional.

3.Exposure estimation (Health ES-7)

No exposure estimation presented for the human health.

Workers : There is a need for limiting the risks; risk reduction measures which are already being applied shall be taken into account.

Consumers: There is at present no need for further information and/or testing and for risk reduction measures beyond those which are being applied already.

Additional information: See table 2 about overview of conclusions with respect to occupational risk characterisation.

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Table 1. Summary of results for the local exposure assessment from final RAR (Risk Assessment Report)

Company	Conc. effluent STP (total) (µg/l)	C _{add} water episode (dissolved) (µg/l)	C _{add} sediment episode (mg/kg _{wwt})	C _{add} agricultura l soil (mg/kg _{wwt})	C _{add} air (100m) (µg/m ³)
Production companies:					
Company 1	0	0	0	0.029	0.078
Company 2	0	0	0	0	0
Company 3 ¹⁾	-	-	-	-	-
Company 4	0	0	0	0.016	0.0433
Company 5	0	0	0	0.013	0.0347
Use categories:					
Agricultural pesticide industry: processing	5,885	0.856	20.5	767	1.48.10 ⁻²
Agricultural fertiliser industry: formulation	4,040	152	3,640	526	0
Agricultural feed industry: formulation (site specific)	0	0	0	0	0
Agricultural feed industry: formulation (generic)	211	7.98	191	27.9	0.928
Chemical industry: processing	10,400	1.51	36.2	1,356	0

1) No data submitted. For the exposure assessment of company 3 is referred to the zinc metal RAR.

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Table 2 Overview of conclusions with respect to occupational risk characterisation from final RAR (Risk Assessment Report)

End point	Conclusions valid for the occupational scenarios									
	Scenario 1a		Scenario 1b		Scenario 2a		Scenario 2b		Scenario 3	
	MOS	conclusion	MOS	conclusion	MOS	conclusion	MOS	conclusion	MOS	conclusion
Acute toxicity										
- dermal	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii
- inhalation	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii
Irritation and corrosivity, single exposure										
- dermal	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii
- inhalation	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii
- eyes	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii
Sensitisation										
- dermal	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii
- inhalation	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii
Repeated dose toxicity, systemic effects										
- dermal	4.8	ii	6.3	ii	4.3	ii	50	ii	100	ii
- inhalation	2.8	ii	13	ii	5	ii	13	ii	125	ii
- combined	1.8	ii	4.2	ii	2.3	ii	10	ii	56	ii
Mutagenicity	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii
Carcinogenicity	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii

End point	Conclusions valid for the occupational scenarios									
	Scenario 1a		Scenario 1b		Scenario 2a		Scenario 2b		Scenario 3	
	MOS	conclusion	MOS	conclusion	MOS	conclusion	MOS	conclusion	MOS	conclusion
Reproductive toxicity										
Fertility	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii
Developmental effects										
- dermal	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii
- inhalation	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii
- combined	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii	n.a.	ii

n.a not applicable

Scenario 1: Production of zinc sulphate

1a) Production of zinc sulphate monohydrate

1b) Production of zinc sulphate hexahydrate

Scenario 2: Production of fertilisers or animal feedstuff

2a) Production of animal feedstuff (monohydrate)

2b) Production of fertiliser (hepta/ hexahydrate)

Scenario 3: Use of fertilisers

MOS: Margin of safety

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Zinc Sulphate

4.Guidance to check compliance with the exposure scenario (Environment)

- Chemical Safety report (CSR) zinc sulphate. 2010.
- Hyne R.V., Pablo F, Moreno J; , Markisch S.J. et al 2005. Influence of water chemistry on the acute toxicity of copper and zinc to the cladoceran Ceriodaphnia dubia. Environm. Toxic. & Chemistry 24,1667-1675
- The European Chemical Industry Council <http://www.cefic.org>
- ESIS (European chemical Substances information System) <http://esis.jrc.ec.europa.eu/>

4. Guidance to check compliance with the exposure scenario (Health)

- ACGIH (1991). American Conference of Governmental Industrial Hygienists Inc., Documentation of the threshold limit values and biological exposure indices, 6th edition.
- Chemical Safety report (CSR) zinc sulphate. 2010.
- European Commission – Joint Research Centre, Institute for Health and Consumer Protection, European Chemicals Bureau (ECB). 2008. European Union Risk Assessment Report Zinc metal, Volume 42. Final report. (S.J. Munn et al. eds.) 812 pp.
- Deutsche Forschungsgemeinschaft (DFG): Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe. MAKund BAT-Werte-Liste (1997). Maximale Arbeitsplatzkonzentrationen und biologische Arbeitsstofftoleranzwerte. Weinheim, FRG.
- HSE (1998). Health and Safety Executive. Occupational exposure limits 1998. Sudbury, England: HSE Books.
- National Board of Occupational Safety and Health (1993). Occupational exposure limit values. Solna, Sweden.
- Occupational Safety and Health Administration, OSHA (1989). U.S. Department of Labor.
- The European Chemical Industry Council <http://www.cefic.org>
- ESIS (European chemical Substances information System) <http://esis.jrc.ec.europa.eu/>