

# FICHA DE DATOS DE SEGURIDAD

(de acuerdo con el Reglamento (UE) 2015/830)

## 494A1T-SULFATO DE MANGANESO 1-H

Versión: 12

Fecha de revisión: 21/05/2020

Página 1 de 10

Fecha de impresión: 21/05/2020

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

#### 1.1 Identificador del producto.

Nombre del producto: SULFATO DE MANGANESO 1-H  
Código del producto: 494A1T  
Nombre químico: Sulfato de manganeso (II) hidratado  
N. CAS: 10034-96-5  
N. registro: 01-2119456624-35-XXXX

#### 1.2 Usos pertinentes identificados de la sustancia y usos desaconsejados.

Uso en la fabricación de fungicidas. Uso en la producción de otros compuestos a base de manganeso y como producto intermedio. Descarga, envasado y limpieza de entornos industriales. Uso en cuero curtido. Uso en tintas de impresión y tintes textiles. Uso como reactivo de laboratorio. Uso en el tratamiento de superficies. Uso como fertilizante (líquido). Uso como fertilizante (granulado).

#### 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: 08940 - Cornellà del Llobregat  
Provincia: Barcelona  
Teléfono: 93 377 02 08  
Fax: 93 377 42 49  
E-mail: [barcelonesa@barcelonesa.com](mailto:barcelonesa@barcelonesa.com)  
Web: [www.grupbarcelonesa.com](http://www.grupbarcelonesa.com)

#### 1.4 Teléfono de emergencia: 704100087 (Disponible 24h)

### SECCIÓN 2: IDENTIFICACIÓN DE LOS PELIGROS.

#### 2.1 Clasificación de la sustancia.

Según el Reglamento (EU) No 1272/2008:

Aquatic Chronic 2 : Tóxico para los organismos acuáticos, con efectos nocivos duraderos.

Eye Dam. 1 : Provoca lesiones oculares graves.

STOT RE 2 : Puede provocar daños en los órganos tras exposiciones prolongadas o repetidas.

#### 2.2 Elementos de la etiqueta.

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

Pictogramas:



Palabra de advertencia:

#### **Peligro**

Frases H:

H318 Provoca lesiones oculares graves.  
H373 Puede provocar daños en los órganos tras exposiciones prolongadas o repetidas.  
H411 Tóxico para los organismos acuáticos, con efectos nocivos duraderos.

Frases P:

P260 No respirar el polvo/el humo/el gas/la niebla/los vapores/el aerosol.  
P273 Evitar su liberación al medio ambiente.  
P280 Llevar guantes/prendas/gafas/máscara de protección.

# FICHA DE DATOS DE SEGURIDAD

(de acuerdo con el Reglamento (UE) 2015/830)

## 494A1T-SULFATO DE MANGANESO 1-H



Versión: 12

Fecha de revisión: 21/05/2020

Página 2 de 10

Fecha de impresión: 21/05/2020

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/...  
P501 Eliminar el contenido/el recipiente en un tratador autorizado de residuos.

Contiene:

Sulfato de manganeso (II) hidratado

### 2.3 Otros peligros.

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.

Nombre químico: [1] Sulfato de manganeso (II) hidratado  
N. CAS: 10034-96-5  
N. registro: 01-2119456624-35-XXXX

[1] Sustancia a la que se aplica un límite comunitario de exposición en el lugar de trabajo (ver sección 8.1).

### 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.

A largo plazo con exposiciones crónicas puede producir lesiones en determinados órganos o tejidos.

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. Mantenga a la persona cómoda. Gírela sobre su lado izquierdo y permanezca allí mientras espera la ayuda médica.

## SECCIÓN 5: MEDIDAS DE LUCHA CONTRA INCENDIOS.

El producto no presenta ningún riesgo particular en caso de incendio.

### 5.1 Medios de extinción.

-Continúa en la página siguiente.-

# FICHA DE DATOS DE SEGURIDAD

(de acuerdo con el Reglamento (UE) 2015/830)

## 494A1T-SULFATO DE MANGANESO 1-H



Versión: 12

Fecha de revisión: 21/05/2020

Página 3 de 10

Fecha de impresión: 21/05/2020

### **Medios de extinción apropiados:**

Polvo extintor o CO<sub>2</sub>. 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.**

#### **Riesgos especiales.**

El fuego puede producir un espeso humo negro. Como consecuencia de la descomposición térmica, pueden formarse productos peligrosos: monóxido de carbono, dióxido de carbono. 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.**

La zona contaminada debe limpiarse inmediatamente con un descontaminante adecuado. Echar el descontaminante a los restos y dejarlo durante varios días hasta que no se produzca reacción, en un envase sin cerrar.

### **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.

### **7.2 Condiciones de almacenamiento seguro, incluidas posibles incompatibilidades.**

Almacenar según la legislación local. Observar las indicaciones de la etiqueta. Almacenar los envases entre 5 y 35 °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	nivel superior
E2	PELIGROS PARA EL MEDIOAMBIENTE - Peligroso para el medio ambiente acuático en la categoría crónica 2	200	500

-Continúa en la página siguiente.-

# FICHA DE DATOS DE SEGURIDAD

(de acuerdo con el Reglamento (UE) 2015/830)

## 494A1T-SULFATO DE MANGANESO 1-H

Versión: 12

Fecha de revisión: 21/05/2020

Página 4 de 10

Fecha de impresión: 21/05/2020

### 7.3 Usos específicos finales.

No disponible.

## SECCIÓN 8: CONTROLES DE EXPOSICIÓN/PROTECCIÓN INDIVIDUAL.

### 8.1 Parámetros de control.

Límite de exposición durante el trabajo para:

Nombre	N. CAS	País	Valor límite	ppm	mg/m <sup>3</sup>
Sulfato de manganeso (II) hidratado	10034-96-5	España [1]	Ocho horas		0,2 Fracción inhalable, (Como Mn), 0,05 Fracción respirable, (Como Mn)
			Corto plazo		
		European Union [2]	Ocho horas		0,2 (as manganese, inhalable fraction) 0,05 (as manganese, respirable fraction)
			Corto plazo		

[1] Según la lista de Valores Límite Ambientales de Exposición Profesional adoptados por el Instituto Nacional de Seguridad y Salud en el Trabajo (INSST) para el año 2018.

[2] According both Binding Occupational Exposure Limits (BOELVs) and Indicative Occupational Exposure Limits (IOELVs) adopted by Scientific Committee for Occupational Exposure Limits to Chemical Agents (SCOEL).

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.

<b>Concentración:</b>	<b>100 %</b>
<b>Usos:</b>	<b>Uso en la fabricación de fungicidas. Uso en la producción de otros compuestos a base de manganeso y como producto intermedio. Descarga, envasado y limpieza de entornos industriales. Uso en cuero curtido. Uso en tintas de impresión y tintes textiles. Uso como reactivo de laboratorio. Uso en el tratamiento de superficies. Uso como fertilizante (líquido). Uso como fertilizante (granulado).</b>
<b>Protección respiratoria:</b>	
EPI:	Mascarilla autofiltrante para partículas
Características:	Marcado «CE» Categoría III. Fabricada en material filtrante, cubre nariz, boca y mentón.
Normas CEN:	EN 149
Mantenimiento:	Previo al uso se comprobará la ausencia de roturas, deformaciones, etc. Por ser un equipo de protección individual desechable, se deberá renovar en cada uso.
Observaciones:	Si no están bien ajustado no protege al trabajador. Se deberán seguir las instrucciones del fabricante respecto al uso apropiado del equipo.
Tipo de filtro necesario:	P2
<b>Protección de las manos:</b>	
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.

# FICHA DE DATOS DE SEGURIDAD

(de acuerdo con el Reglamento (UE) 2015/830)



## 494A1T-SULFATO DE MANGANESO 1-H

Versión: 12

Fecha de revisión: 21/05/2020

Página 5 de 10

Fecha de impresión: 21/05/2020

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
<b>Protección de los ojos:</b>					
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.				
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.				
<b>Protección de la piel:</b>					
EPI:	Ropa de protección contra productos químicos				
Características:	Marcado «CE» Categoría III. La ropa debe tener un buen ajuste. Se debe fijar el nivel de protección en función un parámetro de ensayo denominado "Tiempo de paso" (BT. Breakthrough Time) el cual indica el tiempo que el producto químico tarda en atravesar el material.				
Normas CEN:	EN 464, EN 340, EN 943-1, EN 943-2, EN ISO 6529, EN ISO 6530, EN 13034				
Mantenimiento:	Se deben seguir las instrucciones de lavado y conservación proporcionadas por el fabricante para garantiza una protección invariable.				
Observaciones:	El diseño de la ropa de protección debería facilitar su posicionamiento correcto y su permanencia sin desplazamiento, durante el período de uso previsto, teniendo en cuenta los factores ambientales, junto con los movimientos y posturas que el usuario pueda adoptar durante su actividad.				
EPI:	Calzado de trabajo				
Características:	Marcado «CE» Categoría II.				
Normas CEN:	EN ISO 13287, EN 20347				
Mantenimiento:	Estos artículos se adaptan a la forma del pie del primer usuario. Por este motivo, al igual que por cuestiones de higiene, debe evitarse su reutilización por otra persona.				
Observaciones:	El calzado de trabajo para uso profesional es el que incorpora elementos de protección destinados a proteger al usuario de las lesiones que pudieran provocar los accidentes, se debe revisar los trabajos para los cuales es apto este calzado.				

### SECCIÓN 9: PROPIEDADES FÍSICAS Y QUÍMICAS.

#### 9.1 Información sobre propiedades físicas y químicas básicas.

Aspecto: Sólido rosa

Color: N.D./N.A.

Olor: Inodoro

Umbral olfativo: N.D./N.A.

pH: 6 - 6,5

Punto de Fusión: 449.85 °C

Punto/intervalo de ebullición: N.D./N.A.

Punto de inflamación: N.D./N.A.

Tasa de evaporación: N.D./N.A.

Inflamabilidad (sólido, gas): No

Límite inferior de explosión: N.D./N.A.

Límite superior de explosión: N.D./N.A.

Presión de vapor: N.D./N.A.

Densidad de vapor: N.D./N.A.

Densidad relativa: 2,93

Solubilidad: N.D./N.A.

Liposolubilidad: N.D./N.A.

Hidrosolubilidad: 43 - 45 % w/w

Coefficiente de reparto (n-octanol/agua): N.D./N.A.

Temperatura de autoinflamación: N.D./N.A.

Temperatura de descomposición: 850 °C

Viscosidad: N.D./N.A.

Propiedades explosivas: No

Propiedades comburentes: No

N.D./N.A. = No Disponible/No Aplicable debido a la naturaleza del producto.

# FICHA DE DATOS DE SEGURIDAD

(de acuerdo con el Reglamento (UE) 2015/830)

## 494A1T-SULFATO DE MANGANESO 1-H

Versión: 12

Fecha de revisión: 21/05/2020

Página 6 de 10

Fecha de impresión: 21/05/2020

### 9.2 Otros datos.

Punto de gota: N.D./N.A.

Centelleo: N.D./N.A.

Viscosidad cinemática: N.D./N.A.

% Sólidos: N.D./N.A.

N.D./N.A.= No Disponible/No Aplicable debido a la naturaleza del producto.

## SECCIÓN 10: ESTABILIDAD Y REACTIVIDAD.

### 10.1 Reactividad.

El producto no presenta peligros debido a su reactividad.

### 10.2 Estabilidad química.

Se descompone a partir de 850 °C °C

### 10.3 Posibilidad de reacciones peligrosas.

Puede producirse una descomposición térmica.

### 10.4 Condiciones que deben evitarse.

Evitar las siguientes condiciones:

- Alta temperatura.

### 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 los efectos toxicológicos.

El contacto repetido o prolongado con el producto, puede causar la eliminación de la grasa de la piel, dando lugar a una dermatitis de contacto no alérgica y a que se absorba el producto a través de la piel.

#### Información Toxicológica.

Nombre	Toxicidad aguda			
	Tipo	Ensayo	Especie	Valor
Sulfato de manganeso (II) hidratado	Oral	LD50	Rata	2150 mg/kg [1]
	Cutánea	[1] Indian Journal of Pharmacology. Vol. 23, Pg. 153, 1991.		
	Inhalación			

N. CAS: 10034-96-5 N. CE:

a) toxicidad aguda;  
Datos no concluyentes para la clasificación.

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.

# FICHA DE DATOS DE SEGURIDAD

(de acuerdo con el Reglamento (UE) 2015/830)

## 494A1T-SULFATO DE MANGANESO 1-H

Versión: 12

Fecha de revisión: 21/05/2020

Página 7 de 10

Fecha de impresión: 21/05/2020

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;

Producto clasificado:

Toxicidad en determinados órganos tras exposiciones repetidas, Categoría 2: Puede provocar daños en los órganos tras exposiciones prolongadas o repetidas.

j) peligro por aspiración;

Datos no concluyentes para la clasificación.

### SECCIÓN 12: INFORMACIÓN ECOLÓGICA.

#### 12.1 Toxicidad.

Nombre	Ecotoxicidad			
	Tipo	Ensayo	Especie	Valor
Sulfato de manganeso (II) hidratado  N. CAS: 10034-96-5    N. CE:	Peces	LC50	Pez	130 mg/l (96 h) [1]
	Invertebrados acuáticos	LC50	Crustáceos	17,6 mg/l (48 h) [1]
	Plantas acuáticas			

[1] Lewis, M. 1978. Acute Toxicity of Copper, Zinc, and Manganese in Single and Mixed Salt Solutions to Juvenile Longfin Dace, *Agosia chrysogaster*. J.Fish Biol. 13(6):695-700

[1] Kimball, G. 1978. The Effects of Lesser Known Metals and One Organic to Fathead Minnows (*Pimephales promelas*) and *Daphnia magna*. Manuscr., Dep.of Entomol., Fish.and Wildl., Univ.of Minnesota, Minneapolis, MN :88 p.

#### 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.

No se dispone de información relativa a la Bioacumulación.

#### 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 Otros efectos adversos.

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

### SECCIÓN 13: CONSIDERACIONES RELATIVAS A LA ELIMINACIÓN.

# FICHA DE DATOS DE SEGURIDAD

(de acuerdo con el Reglamento (UE) 2015/830)

## 494A1T-SULFATO DE MANGANESO 1-H

Versión: 12

Fecha de revisión: 21/05/2020

Página 8 de 10

Fecha de impresión: 21/05/2020

### 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.

## 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.

Nº UN: UN3077

### 14.2 Designación oficial de transporte de las Naciones Unidas.

Descripción:

ADR: UN 3077, SUSTANCIA SÓLIDA PELIGROSA PARA EL MEDIO AMBIENTE, N.E.P. (CONTIENE SULFATO DE MANGANESO (II) HIDRATADO), 9, GE III, (-)

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

ICAO/IATA: UN 3077, SUSTANCIA SÓLIDA PELIGROSA PARA EL MEDIO AMBIENTE, N.E.P. (CONTIENE SULFATO DE MANGANESO (II) HIDRATADO), 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

### 14.6 Precauciones particulares para los usuarios.

F-A,S-FEtiquetas: 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



# FICHA DE DATOS DE SEGURIDAD

(de acuerdo con el Reglamento (UE) 2015/830)

## 494A1T-SULFATO DE MANGANESO 1-H

Versión: 12

Fecha de revisión: 21/05/2020

Página 9 de 10

Fecha de impresión: 21/05/2020

contenedores para granel cerrados.  
Transporte por barco, FEm - Fichas de emergencia (F – Incendio, S – Derrames):  
Actuar según el punto 6.

### 14.7 Transporte a granel con arreglo al anexo II del Convenio MARPOL y del Código IBC.

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.**  
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.

### Compuesto orgánico volátil (COV)

Contenido de COV (p/p): 0 %

Contenido de COV: 0 g/l

Clasificación del producto de acuerdo con el Anexo I de la Directiva 2012/18/UE (SEVESO III): E2

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.

### 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:

Aquatic Chronic 2 : Efectos crónicos para el medio ambiente acuático, Categoría 2

Eye Dam. 1 : Lesión ocular grave, Categoría 1

STOT RE 2 : Toxicidad en determinados órganos tras exposiciones repetidas, Categoría 2

Modificaciones respecto a la versión anterior:

- Cambios en la composición del producto (SECCIÓN 3.2).
- Modificación de datos sobre la exposición (SECCIÓN 8.1).
- Modificaciones de los equipos de protección individual (SECCIÓN 8.2).
- Modificación en los valores de las propiedades físico-químicas (SECCIÓN 9).
- Modificación de la información de las condiciones estabilidad y reactividad (SECCIÓN 10.2).
- Modificación de la información de las condiciones estabilidad y reactividad (SECCIÓN 10.3).
- Modificación de la información de las condiciones estabilidad y reactividad (SECCIÓN 10.4).
- Modificación de valores de toxicidad (SECCIÓN 11.1).
- Modificación de valores información ecológica (SECCIÓN 12.1).
- Modificación de la clasificación ADR/IMDG/ICAO/IATA/RID (SECCIÓN 14).

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

Se dispone de Escenario de Exposición del producto.

Abreviaturas y acrónimos utilizados:

ADR: Acuerdo europeo sobre el transporte internacional de mercancías peligrosas por carretera.

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.

# FICHA DE DATOS DE SEGURIDAD

(de acuerdo con el Reglamento (UE) 2015/830)

## 494A1T-SULFATO DE MANGANESO 1-H



Versión: 12

Fecha de revisión: 21/05/2020

Página 10 de 10

Fecha de impresión: 21/05/2020

LC50: Concentración Letal, 50%.  
LD50: Dosis Letal, 50%.  
RID: Regulación concerniente al transporte internacional de mercancías peligrosas por ferrocarril.

Principales referencias bibliográficas y fuentes de datos:

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

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

Reglamento (UE) 2015/830.

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) 2015/830 DE LA COMISIÓN de 28 de mayo de 2015 por el que se modifica el Reglamento (CE) no 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), por el que se crea la Agencia Europea de Sustancias y Preparados Químicos, se modifica la Directiva 1999/45/CE y se derogan el Reglamento (CEE) nº 793/93 del Consejo y el Reglamento (CE) nº 1488/94 de la Comisión así como la Directiva 76/769/CEE del Consejo y las Directivas 91/155/CEE, 93/67/CEE, 93/105/CE y 2000/21/CE de la Comisión.

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.

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 15)

**Annex: Exposure scenario 1**

- **Short title of the exposure scenario** Use of manganese sulphate monohydrate in the manufacture of fungicides.
- **Sector of Use** SU10 Formulation [mixing] of preparations and/or re-packaging (excluding alloys).
- **Product category** PC 0 Other: Fungicides.
- **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).
- **Article category** Not applicable.
- **Notes** Do not use for private / domestic purposes (household).
- **Description of the activities / processes covered in the Exposure Scenario**

This scenario cover the process control, the sampling and maintenance during the manufacture of fungicides. The transfer of the products at dedicated industrial facilities and cleaning is covered in exposure scenario 5.
- **Conditions of use**

Use at not more than 20°C above ambient temperature unless stated differently and good basic standard of occupational hygiene is implemented.
- **Duration and frequency** Processes occur on up to 330 to 360 days per year and run during 24 hours a day.
- **Worker** 8hrs (full working shift).
- **Environment** The product must not be released into the environment.
- **Physical parameters**

The data on the physical - chemical properties in the Exposure Scenario is based on the properties of the preparation.
- **Physical state** Powder
- **Concentration of the substance in the mixture**

The substance is main component and covers percentage up to 99.99 %
- **Used amount per time or activity** 10 tons per day
- **Other operational conditions** Observe the general safety regulations when handling chemicals.
- **Other operational conditions affecting environmental exposure**

Observe section 6 of the Safety Data Sheet (Accidental release measures).
- **Other operational conditions affecting worker exposure**

Respiratory protection is required in work areas with inadequate ventilation and during spraying application. Avoid contact with the skin, eyes and clothing.
- **Other operational conditions affecting consumer exposure**

No identified use for customers in this exposure scenario, therefore not applicable. Keep out of the reach of children.
- **Other operational conditions affecting consumer exposure during the use of the product**

No identified use for customers in this exposure scenario, therefore not applicable.

(Contd. on page 17)

**Safety data sheet**  
**according to 1907/2006/EC, Article 31**

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 16)

· **Risk management measures**

· **Worker protection**

*It is recommended that the workers wear gloves with the indicated efficacy if there is a potential for dermal exposure.*

*If manganese sulphate monohydrates are used in the manufacture fungicides in closed systems with no likelihood for exposure, no RMMs are necessary. If it is used in closed processes with occasional controlled exposure (e.g. sampling), LEV with  $\geq 90\%$  efficacy should be present if the process equipment is placed inside a building. If the process equipment is placed outside, the workers have to wear respiratory protection with  $\geq 90\%$  efficacy.*

*If manganese sulphate monohydrates are used in open processes running inside a building, LEV with  $\geq 90\%$  efficacy should be installed and the workers have to wear respiratory protection with  $\geq 95\%$  efficacy. If such open processes are run outside, no safe conditions could be shown and it should therefore be avoided to run open processes outside if manganese sulphate monohydrate is used as an intermediate or process aid.*

*No RMMs except gloves are required to ensure that the exposure to manganese sulphate is under control when 40%-manganese sulphate solutions are used in the manufacture of fungicides.*

· **Organisational protective measures**

*Regular workplace measurements are implemented to ensure RMM efficiency and compliance and are observed by the staff and the maintenance staff of third party service providers. This is enforced by the supervision of the management and by a certified Quality, Safety and Environmental Management System. The effectiveness of the Risk Management Measures is checked by periodic exposure measurements performed by third party experts on industrial hygiene and environmental protection, who also keep the records of the results. Use sealed systems as far as possible. Adequate eye washes and showers for emergency use.*

· **Technical protective measures**

*Prevent formation of dust.*

*Use product only in enclosed systems.*

*Ensure that suitable extractors are available on processing machines*

· **Personal protective measures**

*Wear appropriate gloves and suitable respiratory protective device with  $\geq 90\%$  efficacy.*

*Wash hands before breaks and at the end of work.*

· **Measures for consumer protection**

*No identified use for customers in this exposure scenario, therefore not applicable.*

*Ensure adequate labelling.*

· **Environmental protection measures**

· **Air** Exhaust air is introduced into the gas scrubber.

· **Water** Do not allow to reach sewage system.

· **Soil**

*Avoid contact with soil and / or ground water during the application.*

*Prevent contamination of soil.*

· **Notes** In case of unintended release of the product: See section 6 of the Safety Data Sheet.

· **Disposal measures** Disposal must be made according to official local regulations.

· **Disposal procedures**

*Must not be disposed together with household garbage. Do not allow product to reach sewage system.*

(Contd. on page 18)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 17)

- **Waste type** Emptied packaging.
- **Exposure estimation** The worker exposure concentrations are calculated with the ECETOC TRA tool.
- **Worker (oral)** Exposure based waiving.
- **Worker (dermal)**

PROC	Indoors/ outdoors	duration (hr.)	Dermal exposure (mg/kg/day)	Dermal exposure with gloves (efficacy in %)	(mg/kg/day)	Total systemic exposure (mg/kg/day)
1	Indoors	8	0.34	80	0.069	0.0003
1	Outdoors	8	0.34	80	0.069	0.0003
2	Indoors	8	1.37	80	0.274	0.008
2	Outdoors	8	1.37	80	0.274	0.006
3	Indoors	8	0.343	80	0.069	0.008
3	Outdoors	8	0.343	80	0.069	0.005
4	Indoors	8	6.86	90	0.686	0.188
4	Outdoors	8	6.86	90	0.686	0.132
5	Indoors	8	13.7	95	0.685	0.188
5	Outdoors	8	13.7	95	0.685	0.132

· **Worker (inhalation)**

The following table is the sum of the part of the inhalation exposure that is systemically available and the part of the dermal exposure that is systemically available and is compared to the systemic DNEL of 0.00414 mg/kg bw/day.

PROC	Indoors/ outdoors	duration (hr.)	Inhalation exposure (mg/kg/day)	Inhalationl exposure with Resp. protection (efficacy in %)	(mg/kg/day)	Total systemic exposure (mg/kg/day)
1	Indoors	8	0.01	no	0.01	0.0003
1	Outdoors	8	0.007	no	0.007	0.0003
2	Indoors	8	1	90	0.1	0.002
2	Outdoors	8	0.7	90	0.07	0.001
3	Indoors	8	1	90	0.1	0.001
3	Outdoors	8	0.7	90	0.07	0.001
4	Indoors	8	25	95	0.125	0.003
4	Outdoors	8	17.5	95	0.875	0.008

(Contd. on page 19)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

5	Indoors	8	25	95	0.125	(Contd. of page 18) 0.003
5	Outdoors	8	17.5	95	0.875	0.008

-----  
· **Environment**

*An exposure assessment for the formulation/use life stage of Manganese sulphate in the manufacture of fungicides has been conducted in accordance with the "Guidance on Information Requirements and Chemical Safety Assessment" (IRCSA), published by ECHA.*

*The PEC values are of less than the background concentration of manganese in the environments (15.9 µg Mn/L in surface water, 452 mg/kg in sediment, 428.6 mg/kg in soil; Hence, they are considered to show that there will be no risk to the environment from this use.*

· **Consumer** *No identified use for customers in this exposure scenario, therefore not applicable.*

· **Guidance for downstream users** *For the risk assessment, the tools recommended by ECHA can be used.*

EU  
(Contd. on page 20)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 19)

**Annex: Exposure scenario 2**

- **Short title of the exposure scenario**  
*Use of the substance in the manufacture of other manganese based compounds and as intermediate.*
- **Sector of Use**  
*SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites*  
*SU8 Manufacture of bulk, large scale chemicals (including petroleum products).*  
*SU9 Manufacture of fine chemicals.*  
*SU12 Manufacture of plastics products, including compounding and conversion.*  
*SU16 Manufacture of computer, electronic and optical products, electrical equipment.*
- **Product category**  
*PC19 Intermediate.*  
*PC20 Products such as pH-regulators, flocculants, precipitants, neutralization agents.*
- **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).*
- **Article category** *Not applicable.*
- **Environmental release category**  
*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.*
- **Notes** *Do not use for private / domestic purposes (household).*
- **Description of the activities / processes covered in the Exposure Scenario**  
*This scenario cover the process control, the sampling and maintenance during the use of manganese sulphate in the production of other manganese based compounds and during the use of manganese sulphate as an intermediate.*
- **Conditions of use**  
*Use at not more than 20°C above ambient temperature unless stated differently and good basic standard of occupational hygiene is implemented.*
- **Duration and frequency** *Processes occur on up to 330 to 360 days per year and run during 24 hours a day.*
- **Worker** *8hrs (full working shift).*
- **Environment** *The product must not be released into the environment.*
- **Physical parameters**  
*The data on the physical - chemical properties in the Exposure Scenario is based on the properties of the preparation.*
- **Physical state** *Powder*

(Contd. on page 21)

**Safety data sheet**  
**according to 1907/2006/EC, Article 31**

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 20)

· **Concentration of the substance in the mixture**

*The substance is main component and covers percentage up to 99.99 %*

· **Used amount per time or activity** 10 tons per day

· **Other operational conditions** *Observe the general safety regulations when handling chemicals.*

· **Other operational conditions affecting environmental exposure**

*Observe section 6 of the Safety Data Sheet (Accidental release measures).*

· **Other operational conditions affecting worker exposure**

*Respiratory protection is required in work areas with inadequate ventilation and during spraying application. Avoid contact with the skin, eyes and clothing.*

· **Other operational conditions affecting consumer exposure**

*No identified use for customers in this exposure scenario, therefore not applicable. Keep out of the reach of children.*

· **Other operational conditions affecting consumer exposure during the use of the product**

*No identified use for customers in this exposure scenario, therefore not applicable.*

· **Risk management measures**

· **Worker protection**

*It is recommended that the workers wear appropriate gloves if there is a potential for dermal exposure.*

*If manganese sulphate monohydrates are used in the manufacture of other manganese based products or as intermediates in closed systems with no likelihood for exposure, no RMMS are necessary. If it is used in closed processes with occasional controlled exposure (e.g. sampling), LEV with  $\geq 90\%$  efficacy should be present if the process equipment is placed inside a building. If the process equipment is placed outside, the workers have to wear respiratory protection with  $\geq 90\%$  efficacy.*

*If manganese sulphate monohydrates are used in open processes running inside a building, LEV with  $\geq 90\%$  efficacy should be installed and the workers have to wear respiratory protection with  $\geq 95\%$  efficacy. If such open processes are run outside, no safe conditions could be shown and it should therefore be avoided to run open processes outside if manganese sulphate monohydrate is used as an intermediate or process aid.*

*No RMMS except gloves are required to ensure that the exposure to manganese sulphate is under control when 40%-manganese sulphate solutions are used as intermediates or process aids.*

· **Organisational protective measures**

*Regular workplace measurements are implemented to ensure RMM efficiency and compliance and are observed by the staff and the maintenance staff of third party service providers. This is enforced by the supervision of the management and by a certified Quality, Safety and Environmental Management System. The effectiveness of the Risk Management Measures is checked by periodic exposure measurements performed by third party experts on industrial hygiene and environmental protection, who also keep the records of the results. Use sealed systems as far as possible. Adequate eye washes and showers for emergency use.*

· **Technical protective measures**

*Prevent formation of dust.*

*Use product only in enclosed systems.*

*Ensure that suitable extractors are available on processing machines*

(Contd. on page 22)



**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 21)

· **Personal protective measures**

*Wear suitable protective gloves and protective goggles /face protection during work.*

*Wear suitable respiratory protective device with  $\geq 90\%$  efficacy as indicated in the respective Exposure scenario of the Annex.*

*Wash hands before breaks and at the end of work.*

· **Measures for consumer protection**

*No identified use for customers in this exposure scenario, therefore not applicable.*

· **Environmental protection measures** No specific measures required for the environment.

· **Air** Exhaust air is introduced into the gas scrubber.

· **Water** Do not allow to reach sewage system.

· **Soil** Avoid contact with soil and / or ground water during the application.

· **Notes** In case of unintended release of the product: See section 6 of the Safety Data Sheet.

· **Disposal measures** Disposal must be made according to official local regulations.

· **Disposal procedures**

*Must not be disposed together with household garbage. Do not allow product to reach sewage system.*

· **Waste type**

*Wet waste from the manufacturing processes should be collected in a double plastic lined collecting pond on site.*

· **Exposure estimation** The worker exposure concentrations are calculated with the ECETOC TRA tool.

· **Worker (oral)** Exposure based waiving.

· **Worker (dermal)**

PROC	Indoors/ outdoors	duration (hr.)	Dermal exposure (mg/kg/day)	Dermal exposure with gloves (efficacy in %)	(mg/kg/day)	Total systemic exposure (mg/kg/day)
1	Indoors	8	0.34	80	0.069	0.0003
1	Outdoors	8	0.34	80	0.069	0.0003
2	Indoors	8	1.37	80	0.274	0.008
2	Outdoors	8	1.37	80	0.274	0.006
3	Indoors	8	0.343	80	0.069	0.008
3	Outdoors	8	0.343	80	0.069	0.005
4	Indoors	8	6.86	90	0.686	0.188
4	Outdoors	8	6.86	90	0.686	0.132
5	Indoors	8	13.7	95	0.685	0.188
5	Outdoors	8	13.7	95	0.685	0.132

(Contd. on page 23)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 22)

· **Worker (inhalation)**

The following table is the sum of the part of the inhalation exposure that is systemically available and the part of the dermal exposure that is systemically available and is compared to the systemic DNEL of 0.00414 mg/kg bw/day.

PROC	Indoors/ outdoors	duration (hr.)	Inhalation exposure (mg/kg/day)	Inhalationl exposure with Resp. protection (efficacy in %)	Total systemic exposure (mg/kg/day)	Total systemic exposure (mg/kg/day)
1	Indoors	8	0.01	no	0.01	0.0003
1	Outdoors	8	0.007	no	0.007	0.0003
2	Indoors	8	1	90	0.1	0.002
2	Outdoors	8	0.7	90	0.07	0.001
3	Indoors	8	1	90	0.1	0.001
3	Outdoors	8	0.7	90	0.07	0.001
4	Indoors	8	25	95	0.125	0.003
4	Outdoors	8	17.5	95	0.875	0.008
5	Indoors	8	25	95	0.125	0.003
5	Outdoors	8	17.5	95	0.875	0.008

· **Environment**

An exposure assessment for the formulation/use life stage of Manganese sulphate in the manufacture of fungicides has been conducted in accordance with the "Guidance on Information Requirements and Chemical Safety Assessment" (IRCSA), published by ECHA.

The PEC values are of less than the background concentration of manganese in the environments (15.9 µg Mn/L in surface water, 452 mg/kg in sediment, 428.6 mg/kg in soil; Hence, they are considered to show that there will be no risk to the environment from this use.

· **Consumer** No identified use for customers in this exposure scenario, therefore not applicable.

· **Guidance for downstream users** For the risk assessment, the tools recommended by ECHA can be used.

EU

(Contd. on page 24)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 23)

**Annex: Exposure scenario 3**

- **Short title of the exposure scenario** Unloading, packaging and cleaning in industrial settings.
- **Sector of Use**
  - SU1 Agriculture, forestry, fishery
  - SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
  - SU4 Manufacture of food products
  - SU5 Manufacture of textiles, leather, fur.
  - SU6a Manufacture of wood and wood products.
  - SU6b Manufacture of pulp, paper and paper products.
  - SU8 Manufacture of bulk, large scale chemicals (including petroleum products).
  - SU9 Manufacture of fine chemicals.
  - SU10 Formulation [mixing] of preparations and/or re-packaging (excluding alloys).
  - SU12 Manufacture of plastics products, including compounding and conversion.
  - SU13 Manufacture of other non-metallic mineral products, e.g. plasters, cement.
  - SU14 Manufacture of basic metals, including alloys.
  - SU16 Manufacture of computer, electronic and optical products, electrical equipment.
  - SU19 Building and construction work.
  - SU20 Health services.
- **Product category**
  - PC7 Base metals and alloys.
  - PC9a Coatings and paints, thinners, paint removers.
  - PC12 Fertilizers.
  - PC15 Non-metal-surface treatment products.
  - PC21 Laboratory chemicals.
  - PC23 Leather tanning, dye, finishing, impregnation and care products.
  - PC27 Plant protection products.
  - PC34 Textile dyes, finishing and impregnating products; including bleaches and other processing aids.
  - PC36 Water softeners.
  - PC37 Water treatment chemicals.
  - PC39 Cosmetics, personal care products.
- **Process category**
  - PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at nondedicated 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).
- **Article category** Not applicable.
- **Notes** Do not use for private / domestic purposes (household).

(Contd. on page 25)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 24)

· **Description of the activities / processes covered in the Exposure Scenario**

*This scenario cover the unloading of materials from transport containers at industrial settings and the packaging of the manganese sulphate products or formulated preparations containing the substance at dedicated or non-dedicated facilities and cleaning activities performed on a regular basis on each working day or in campaigns.*

· **Conditions of use**

*Use at ambient temperature unless stated differently and good basic standard of occupational hygiene is implemented.*

· **Duration and frequency**

*Unloading, packaging and cleaning occur during normal working days on up to 360 days per year.*

*Packaging may be performed nearly continuously for 24 hours a day, and unloading and cleaning operations take significantly less than a working shift of 8 hours per day.*

· **Worker 8hrs (full working shift).**

· **Environment** *The product must not be released into the environment.*

· **Physical parameters**

*The data on the physical - chemical properties in the Exposure Scenario is based on the properties of the preparation.*

· **Physical state** Powder

· **Concentration of the substance in the mixture**

*The substance is main component and covers percentage up to 99.99 %*

· **Used amount per time or activity** 25 tons per day

· **Other operational conditions** *Observe the general safety regulations when handling chemicals.*

· **Other operational conditions affecting environmental exposure**

*Observe section 6 of the Safety Data Sheet (Accidental release measures).*

· **Other operational conditions affecting worker exposure**

*Respiratory protection is required in work areas with inadequate ventilation and during spraying application.*

*Avoid contact with the skin, eyes and clothing.*

· **Other operational conditions affecting consumer exposure**

*No identified use for customers in this exposure scenario, therefore not applicable.*

· **Other operational conditions affecting consumer exposure during the use of the product**

*No identified use for customers in this exposure scenario, therefore not applicable.*

· **Risk management measures**

· **Worker protection**

*It is recommended that the workers wear appropriate gloves if there is a potential for dermal exposure.*

*If manganese sulphate monohydrate has to be transferred, LEV with  $\geq 90\%$  efficacy (95% efficacy for PROC 8b, ECETOC default value) has to be present and the workers have to wear respiratory protection with  $\geq 95\%$  efficacy (90% for PROC 8b).*

*It is not recommended that transfer activities involving manganese sulphate monohydrate are performed outside, as no safe conditions could be found for this use.*

*No RMMs except gloves are required to ensure that the exposure to manganese sulphate is under control during transfer and cleaning activities with solutions containing up to 40% manganese sulphate.*

(Contd. on page 26)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 25)

· **Organisational protective measures**

Regular workplace measurements are implemented to ensure RMM efficiency and compliance and are observed by the staff and the maintenance staff of third party service providers. This is enforced by the supervision of the management and by a certified Quality, Safety and Environmental Management System. The effectiveness of the Risk Management Measures is checked by periodic exposure measurements performed by third party experts on industrial hygiene and environmental protection, who also keep the records of the results. Use sealed systems as far as possible. Adequate eye washes and showers for emergency use.

· **Technical protective measures**

Prevent formation of dust.  
Use product only in enclosed systems.  
Ensure that suitable extractors are available on processing machines

· **Personal protective measures**

Wear appropriate gloves and suitable respiratory protective device with  $\geq 90\%$  efficacy.  
Wash hands before breaks and at the end of work.  
Avoid contact with the eyes.

· **Measures for consumer protection**

No identified use for customers in this exposure scenario, therefore not applicable.

· **Environmental protection measures**

- **Air** No special measures required.
- **Water** Do not allow to reach sewage system.
- **Soil** Avoid contact with soil and / or ground water during the application.
- **Notes** In case of unintended release of the product: See section 6 of the Safety Data Sheet.
- **Disposal measures** Disposal must be made according to official local regulations.

· **Disposal procedures**

Must not be disposed together with household garbage. Do not allow product to reach sewage system.

· **Waste type** Emptied packaging.

· **Exposure estimation** The worker exposure concentrations are calculated with the ECETOC TRA tool.

· **Worker (oral)** Exposure based waiving.

· **Worker (dermal)**

PROC	Indoors/ outdoors	duration (hr.)	Dermal exposure (mg/kg/day)	Dermal exposure with gloves (efficacy in %)	(mg/kg/day)	Total systemic exposure (mg/kg/day)
8a	Indoors	8	13.7	95	0.685	0.375
8a	Outdoors	8	13.7	95	0.685	0.263
8b	Indoors	8	6.86	90	0.686	0.188
8b	Outdoors	8	6.86	90	0.686	0.132
9	Indoors	8	6.86	90	0.686	0.151
9	Outdoors	8	6.86	90	0.686	0.106

(Contd. on page 27)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 26)

**· Worker (inhalation)**

The following table is the sum of the part of the inhalation exposure that is systemically available and the part of the dermal exposure that is systemically available and is compared to the systemic DNEL of 0.00414 mg/kg bw/day.

PROC	Indoors/ outdoors	duration (hr.)	Inhalation exposure (mg/kg/day)	Inhalationl exposure with Resp. protection (efficacy in %)	Total systemic exposure (mg/kg/day)	Total systemic exposure (mg/kg/day)
8a	Indoors	8	50	95	0.25	0.004
8a	Outdoors	8	35	95	1.75	0.015
8b	Indoors	8	25	90	0.125	0.003
8b	Outdoors	8	17.5	90	0.875	0.008
9	Indoors	8	20	95	0.1	0.003
9	Outdoors	8	14	95	0.7	0.007

**· Environment**

An exposure assessment for the formulation/use life stage of Manganese sulphate in the manufacture of fungicides has been conducted in accordance with the "Guidance on Information Requirements and Chemical Safety Assessment" (IRCSA), published by ECHA.

The PEC values are of less than the background concentration of manganese in the environments (15.9 µg Mn/L in surface water, 452 mg/kg in sediment, 428.6 mg/kg in soil; Hence, they are considered to show that there will be no risk to the environment from this use.

· **Consumer** No identified use for customers in this exposure scenario, therefore not applicable.

· **Guidance for downstream users** For the risk assessment, the tools recommended by ECHA can be used.

EU  
(Contd. on page 28)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 27)

**Annex: Exposure scenario 4**

· **Short title of the exposure scenario**

*Use in the formulation of liquid fertilizers and professional use of fertilisers containing MnSO<sub>4</sub> by spraying solutions.*

· **Sector of Use SU1** Agriculture, forestry, fishery

· **Product category PC12** Fertilizers.

· **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 nondedicated facilities.*

*PROC11 Non industrial spraying.*

*PROC19 Hand-mixing with intimate contact and only PPE available.*

· **Article category** Not applicable.

· **Notes** Do not use for private / domestic purposes (household).

· **Description of the activities / processes covered in the Exposure Scenario**

*This scenario covers the formulation of fertilizers containing manganese sulphate, the delivery of pure manganese sulphate powder, preparations or granulate to downstream users, storage at appropriate facilities, preparation of the spraying solution by emptying transport containers into a mixing vessel and mixing manganese sulphate with water, loading the sprayer, driving the sprayer, applying the solution to the field and washing out the sprayer afterwards. Powder containing manganese sulphate may be delivered to professionals who empty the transport containers or bags, mix the powder with water and apply the resulting solution to the field or growing crop using a motorised sprayer.*

· **Conditions of use**

*Use at ambient temperature unless stated differently and good basic standard of occupational hygiene is implemented.*

· **Duration and frequency**

*Formulation of fertilizers with manganese sulphate monohydrate powder may occur on approximately 200 to 300 days per year and 24 hrs a day.*

*Preparation and spraying of manganese sulphate solutions may occur on 150 days per year and the exposure duration may be up to 8 hours per working day.*

· **Worker** 8hrs (full working shift).

· **Environment** The product must not be released into the environment.

· **Physical parameters**

*The data on the physical - chemical properties in the Exposure Scenario is based on the properties of the preparation.*

(Contd. on page 29)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 28)

· **Physical state**

*Powder*

*Liquid*

· **Concentration of the substance in the mixture**

*The substance is main component and covers percentage up to 99.99 %*

· **Used amount per time or activity** 5000 tons per year

· **Other operational conditions** *Observe the general safety regulations when handling chemicals.*

· **Other operational conditions affecting environmental exposure** *No special measures required.*

· **Other operational conditions affecting worker exposure**

*Avoid contact with the skin, eyes and clothing.*

*Respiratory protection is required in work areas with inadequate ventilation and during spraying application.*

· **Other operational conditions affecting consumer exposure**

*No identified use for customers in this exposure scenario, therefore not applicable.*

*Keep out of the reach of children.*

· **Other operational conditions affecting consumer exposure during the use of the product**

*No identified use for customers in this exposure scenario, therefore not applicable.*

· **Risk management measures**

· **Worker protection**

*It is recommended that the workers wear appropriate gloves during the formulation of fertilizers if there is a potential for dermal exposure.*

*If manganese sulphate monohydrate is formulated in closed formulation processes with no likelihood for exposure, no additional RMMs are needed. If manganese sulphate monohydrate is formulated in closed continuous formulation processes with occasional controlled exposure (e.g. sampling), LEV with  $\geq 90\%$  efficacy should be present if the process equipment is placed inside a building. If the process equipment is placed outside, the workers have to wear respiratory protection with  $\geq 90\%$  efficacy. If manganese sulphate monohydrate is formulated in open processes running inside a building, LEV with  $\geq 90\%$  efficacy should be installed and the workers have to wear respiratory protection with  $\geq 95\%$  efficacy. If such open processes are run outside, no safe conditions could be shown and it should therefore be avoided to run open processes outside if manganese sulphate monohydrate is used in formulation processes.*

*During application of the fertilizer in an agricultural setting, the workers have to wear gloves during the mixing of the powder with water and during the loading of the sprayer. They have to wear gloves, coverall, sturdy footwear and a face shield during the application of the fertiliser to the field by spraying.*

· **Organisational protective measures**

*Regular workplace measurements are implemented to ensure RMM efficiency and compliance and are observed by the staff and the maintenance staff of third party service providers. This is enforced by the supervision of the management and by a certified Quality, Safety and Environmental Management System. The effectiveness of the Risk Management Measures is checked by periodic exposure measurements performed by third party experts on industrial hygiene and environmental protection, who also keep the records of the results. Use sealed systems as far as possible. Adequate eye washes and showers for emergency use.*

· **Technical protective measures**

*Prevent formation of dust.*

(Contd. on page 30)



**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 29)

Ensure that suitable extractors are available on processing machines

· **Personal protective measures**

Wash hands and face thoroughly before breaks and at end of work; take a shower, if necessary.

Wear suitable protective gloves and protective goggles /face protection during work.

Suitable respiratory protective device recommended.

· **Measures for consumer protection**

No identified use for customers in this exposure scenario, therefore not applicable.

· **Environmental protection measures**

By definition, manganese sulphate is applied to agricultural fields or pots of soil where there is a manganese deficiency and therefore the application of the manganese sulphate will not result in levels significantly about the natural range of manganese levels in soil. Since the compound is specifically targeted to soil application there can be expected to be no significant loss to STP. Overall it is therefore concluded that there is no adverse environmental impact from the formulation/use of manganese sulphate as a liquid fertilizer

· **Air** No special measures required.

· **Water** Do not allow to reach sewage system.

· **Soil**

By definition, manganese sulphate is applied to agricultural fields or pots of soil where there is a manganese deficiency and therefore the application of the manganese sulphate will not result in levels significantly about the natural range of manganese levels in soil. Since the compound is specifically targeted to soil application there can be expected to be no significant loss to STP.

Avoid contact with soil and / or ground water during the application.

· **Notes** In case of unintended release of the product: See section 6 of the Safety Data Sheet.

· **Disposal measures** Disposal must be made according to official local regulations.

· **Disposal procedures**

Must not be disposed together with household garbage. Do not allow product to reach sewage system.

· **Waste type** Emptied packaging.

· **Exposure estimation** The worker exposure concentrations are calculated with the ECETOC TRA tool.

· **Worker (oral)** Exposure based waiving.

· **Worker (dermal)**

Exposure to manganese sulphate during application of fertilizer

Activity	RMMs	Inhalation exposure (mg/m <sup>3</sup> )	Dermal exposure (mg/kg/day)	Total systemic exposure (mg/kg/day)
Mixing / Loading	-----	0.002	0.3	0.00089

PROC	Indoors/ outdoors	duration (hr.)	Dermal exposure (mg/kg/day)	Dermal exposure with gloves (efficacy in %) (mg/kg/day)	Total systemic exposure (mg/kg/day)
1	Indoors	8	0.34	80	0.069
1	Outdoors	8	0.34	80	0.069

(Contd. on page 31)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 30)

2	Indoors	8	1.37	80	0.274	0.008
2	Outdoors	8	1.37	80	0.274	0.006
3	Indoors	8	0.343	80	0.069	0.008
3	Outdoors	8	0.343	80	0.069	0.005
4	Indoors	8	6.86	90	0.686	0.188
4	Outdoors	8	6.86	90	0.686	0.132
5	Indoors	8	13.7	95	0.685	0.188
5	Outdoors	8	13.7	95	0.685	0.132

**Worker (inhalation)**

The following table is the sum of the part of the inhalation exposure that is systemically available and the part of the dermal exposure that is systemically available and is compared to the systemic DNEL of 0.00414 mg/kg bw/day.

PROC	Indoors/ outdoors	duration (hr.)	Inhalation exposure (mg/kg/day)	Inhalationl exposure with protection (efficacy in %)	Resp. Total systemic exposure (mg/kg/day)	Total systemic exposure (mg/kg/day)
1	Indoors	8	0.01	no	0.01	0.0003
1	Outdoors	8	0.007	no	0.007	0.0002
2	Indoors	8	1	90	0.1	0.002
2	Outdoors	8	0.7	90	0.07	0.001
3	Indoors	8	1	90	0.1	0.001
3	Outdoors	8	0.7	90	0.07	0.001
4	Indoors	8	25	95	0.125	0.003
4	Outdoors	8	17.5	95	0.875	0.008
5	Indoors	8	25	95	0.125	0.003
5	Outdoors	8	17.5	95	0.875	0.008

**Environment**

No significant exposure of humans via the environment is anticipated since manganese sulphate is not predicted to accumulate or be transferred to animal tissues and nor is it expected to reach significant levels in groundwater. By definition, manganese sulphate is applied to agricultural fields or pots of soil where there is a manganese deficiency and therefore the application of the manganese sulphate will not result in levels significantly about the natural range of manganese levels in soil. Since the compound is specifically targeted to soil application there can be expected to be no significant loss to STP. Overall it is therefore concluded that there is no adverse

(Contd. on page 32)

***Safety data sheet***  
***according to 1907/2006/EC, Article 31***

***Trade name: Manganese sulphate monohydrate***

*environmental impact from the formulation/use of manganese sulphate as a liquid fertilizer*

(Contd. of page 31)

· ***Consumer*** *No identified use for customers in this exposure scenario, therefore not applicable.*

· ***Guidance for downstream users*** *For the risk assessment, the tools recommended by ECHA can be used.*

EU

(Contd. on page 33)

**Safety data sheet**  
**according to 1907/2006/EC, Article 31**

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 32)

**Annex: Exposure scenario 5**

- **Short title of the exposure scenario**  
*Formulation of granulate fertilizers and professional and private use of fertiliser granulates containing MnSO<sub>4</sub>.*
- **Sector of Use**  
*No code; Formulation of granulate fertilizers and professional and private use of fertiliser granulates*
- **Product category** PC12 Fertilizers.
- **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 nondedicated facilities.*  
*PROC14 Production of preparations or articles by tableting, compression, extrusion, pelletisation.*  
*PROC19 Hand-mixing with intimate contact and only PPE available.*
- **Article category** Not applicable.
- **Description of the activities / processes covered in the Exposure Scenario**  
*This scenario covers the formulation of granulate fertilizers takes place in a range of processes, such as closed, contained processes with almost no possibility of direct contact to semi-closed or open multistage processes providing the opportunity for significant exposure at any stage, the preparation of solutions by dissolving granular fertilisers in water, emptying of transport bags into vessel, mixing with water, filling of watering can or irrigation system and the irrigation of plants. Further, it covers the use of fertilizer in form of a small rod that can be placed in flowerpots and is meant to release the nutrients over a longer period.*
- **Conditions of use**  
*Use at ambient temperature unless stated differently and good basic standard of occupational hygiene is implemented.*
- **Duration and frequency**  
*Formulation of fertilizers with manganese sulphate monohydrate powder may occur on approximately 200 to 300 days per year up to 24 hours a day.*  
*The exposure duration during the application of the fertilizer is expected to be considerably less than 8 hours per day.*  
*Gardeners may use such fertilisers regularly on approximately 100 to 150 days per year, whereas private users will use the fertilisers infrequently 4 times a year.*
- **Worker** 8hrs (full working shift).
- **Environment** The product must not be released into the environment.
- **Physical parameters**  
*The data on the physical - chemical properties in the Exposure Scenario is based on the properties of the preparation.*

(Contd. on page 34)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 33)

· **Physical state**

Granulate

Liquid

· **Concentration of the substance in the mixture**

The substance is main component and covers percentage up to 99.99 %

· **Used amount per time or activity** 3000 tons per year

· **Other operational conditions** Observe the general safety regulations when handling chemicals.

· **Other operational conditions affecting environmental exposure** No special measures required.

· **Other operational conditions affecting worker exposure**

Avoid contact with the skin, eyes and clothing.

Respiratory protection is required in work areas with inadequate ventilation and during spraying application.

· **Other operational conditions affecting consumer exposure** Keep out of the reach of children.

· **Other operational conditions affecting consumer exposure during the use of the product**

Consumers may experience the same acute exposure to manganese sulphate as the professionals when using fertilizer, i.e. an inhalation exposure of 0.002 mg/m<sup>3</sup> and a dermal exposure of 0.3 mg/kg body weight/day. However, it is expected that they use fertilizers infrequently and for short durations only.

· **Risk management measures**

· **Worker protection**

It is recommended that the workers wear appropriate gloves during formulation of fertilizer if there is a potential for dermal exposure.

If manganese sulphate monohydrate is formulated in closed formulation processes with no likelihood for exposure, no additional RMMs are needed. If manganese sulphate monohydrate is formulated in closed continuous formulation processes with occasional controlled exposure may be in sampling, LEV with ≥90% efficacy should be present if the process equipment is placed inside a building. If the process equipment is placed outside, the workers have to wear respiratory protection with ≥90% efficacy. If manganese sulphate monohydrate is formulated in open processes running inside a building, LEV with ≥90% efficacy should be installed and the workers have to wear respiratory protection with ≥95% efficacy. If such open processes are run outside, no safe conditions could be shown and it should therefore be avoided to run open processes outside if manganese sulphate monohydrate is used in formulation.

No RMMs are necessary if fertilizer in granulate form is dissolved in water and subsequently poured on plants or if rods are placed in flowerpots.

· **Organisational protective measures**

Regular workplace measurements are implemented to ensure RMM efficiency and compliance and are observed by the staff and the maintenance staff of third party service providers. This is enforced by the supervision of the management and by a certified Quality, Safety and Environmental Management System. The effectiveness of the Risk Management Measures is checked by periodic exposure measurements performed by third party experts on industrial hygiene and environmental protection, who also keep the records of the results. Use sealed systems as far as possible. Adequate eye washes and showers for emergency use.

· **Technical protective measures**

Prevent formation of dust.

Ensure that suitable extractors are available on processing machines

(Contd. on page 35)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 34)

· **Personal protective measures**

Wash hands and face thoroughly before breaks and at end of work; take a shower, if necessary.

Wear suitable protective gloves and protective goggles /face protection during work.

Suitable respiratory protective device recommended.

· **Measures for consumer protection** Keep out of reach of children.

· **Environmental protection measures** No special measures required.

· **Air** No special measures required.

· **Water** Do not allow to reach sewage system.

· **Soil**

By definition, manganese sulphate is applied to agricultural fields or pots of soil where there is a manganese deficiency and therefore the application of the manganese sulphate will not result in levels significantly about the natural range of manganese levels in soil. Since the compound is specifically targeted to soil application there can be expected to be no significant loss to STP.

· **Notes** In case of unintended release of the product: See section 6 of the Safety Data Sheet.

· **Disposal measures** Disposal must be made according to official local regulations.

· **Disposal procedures**

Must not be disposed together with household garbage. Do not allow product to reach sewage system.

· **Waste type** Emptied packaging.

· **Exposure estimation** The worker exposure concentrations are calculated with the ECETOC TRA tool.

· **Worker (oral)** Exposure based waiving.

· **Worker (dermal)**

Exposure to manganese sulphate during application of fertilizer

Activity	RMMS	Inhalation exposure (mg/m <sup>3</sup> )	Dermal exposure (mg/kg/day)	Total systemic exposure (mg/kg/day)
Mixing / Loading	----	0.002	0.3	0.00089

PROC	Indoors/ outdoors	duration (hr.)	Dermal exposure (mg/kg/day)	Dermal exposure with gloves (efficacy in %) (mg/kg/day)	Total systemic exposure (mg/kg/day)	
1	Indoors	8	0.34	80	0.069	0.0003
1	Outdoors	8	0.34	80	0.069	0.0002
2	Indoors	8	1.37	80	0.274	0.008
2	Outdoors	8	1.37	80	0.274	0.006
3	Indoors	8	0.343	80	0.069	0.008
3	Outdoors	8	0.343	80	0.069	0.005
4	Indoors	8	6.86	90	0.686	0.188

(Contd. on page 36)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 35)

4	Outdoors	8	6.86	90	0.686	0.132
5	Indoors	8	13.7	95	0.685	0.188
5	Outdoors	8	13.7	95	0.685	0.132
14	Indoors	8	3.43	80	0.686	0.077

**Worker (inhalation)**

The following table is the sum of the part of the inhalation exposure that is systemically available and the part of the dermal exposure that is systemically available and is compared to the systemic DNEL of 0.00414 mg/kg bw/day.

PROC	Indoors/ outdoors	duration (hr.)	Inhalation exposure (mg/kg/day)	Inhalationl exposure with Resp. protection (efficacy in %)	Total systemic exposure (mg/kg/day)
1	Indoors	8	0.01	no	0.01
1	Outdoors	8	0.007	no	0.007
2	Indoors	8	1	90	0.1
2	Outdoors	8	0.7	90	0.07
3	Indoors	8	1	90	0.1
3	Outdoors	8	0.7	90	0.07
4	Indoors	8	25	95	0.125
4	Outdoors	8	17.5	95	0.875
5	Indoors	8	25	95	0.125
5	Outdoors	8	17.5	95	0.875
14	Indoors	8	10	90	0.1

**Environment**

By definition, manganese sulphate is applied to agricultural fields or pots of soil where there is a manganese deficiency and therefore the application of the manganese sulphate will not result in levels significantly about the natural range of manganese levels in soil. Since the compound is specifically targeted to soil application there can be expected to be no significant loss to STP. Overall it is therefore concluded that there is no adverse environmental impact from the formulation/use of manganese sulphate as a granulate fertilizer including slow release rod

No significant exposure of humans via the environment is anticipated since manganese sulphate is not predicted to accumulate or be transferred to animal tissues and nor is it expected to reach significant levels in groundwater.

(Contd. on page 37)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

**Trade name: Manganese sulphate monohydrate**

(Contd. of page 36)

· **Consumer**

*Exposure to manganese sulphate during application of fertilizer*

<i>Activity</i>	<i>RMMs</i>	<i>Inhalation exposure (mg/m<sup>3</sup>)</i>	<i>Dermal exposure (mg/kg/day)</i>	<i>Total systemic exposure (mg/kg/day)</i>
<i>Mixing / Loading</i>	-----	0.002	0.3	0.00089

*Consumers may experience the same acute exposure to manganese sulphate as the professionals when using fertilizer, i.e. an inhalation exposure of 0.002 mg/m<sup>3</sup> and a dermal exposure of 0.3 mg/kg body weight/day. However, it is expected that they use fertilizers infrequently and for short durations only.*

· **Guidance for downstream users** *For the risk assessment, the tools recommended by ECHA can be used.*