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

1.1 Identificador del producto.

Nombre del producto:	FORMIATO CALCICO
Código del producto:	481A1N
Nombre químico:	diformiato de calcio
N. CAS:	544-17-2
N. CE:	208-863-7
N. registro:	01-2119486476-24-XXXX

1.2 Usos pertinentes identificados de la sustancia y usos desaconsejados.

Genérico industrial

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
Web:	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:
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
Frases H:
H318 Provoca lesiones oculares graves.

Frases P:
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.

Indicaciones de peligro suplementarias:
EUH070 Tóxico en contacto con los ojos.

Contiene:

-Continúa *en la página siguiente.*-

diformiato de calcio

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:	diformiato de calcio
N. CAS:	544-17-2
N. CE:	208-863-7
N. registro:	01-2119486476-24-XXXX

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 encuentre 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.
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.
Solicite ayuda médica de inmediato. 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. Cubra la zona afectada con un apósito estéril seco. Proteja la zona afectada de presión o fricción.

SECCIÓN 5: MEDIDAS DE LUCHA CONTRA INCENDIOS.

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

5.1 Medios de extinción.
Medios de extinción apropiados:
Polvo 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.

-Continúa *en la página siguiente.*-

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.

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.
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. No emplear nunca presión para vaciar los envases, no son recipientes resistentes a la presión.
En la zona de aplicación debe estar prohibido fumar, comer y beber.
Cumplir con la legislación sobre seguridad e higiene en el trabajo.
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.
El producto no se encuentra afectado por la Directiva 2012/18/UE (SEVESO III).
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.
Niveles de concentración DNEL/DMEL:

Nombre	DNEL/DMEL	Tipo	Valor
diformiato de calcio N. CAS: 544-17-2 N. CE: 208-863-7	DNEL (Consumidores)	Oral, Crónico, Efectos sistémicos	23,9 (mg/kg bw/day)

-Continúa *en la página siguiente.*-

	DNEL (Consumidores)	Cutánea, Crónico, Efectos locales	8,3 (mg/cm²)
	DNEL (Consumidores)	Inhalación, Crónico, Efectos sistémicos	83,2 (mg/cm²)

DNEL: Derived No Effect Level, (nivel sin efecto obtenido) nivel de exposición a la sustancia por debajo del cual no se prevén efectos adversos.
DMEL: Derived Minimal Effect Level, nivel de exposición que corresponde a un riesgo bajo, que debe considerarse un riesgo mínimo tolerable.

Niveles de concentración PNEC:

Nombre	Detalles	Valor
diformiato de calcio N. CAS: 544-17-2 N. CE: 208-863-7	Water (Freshwater)	2 (2 mg/L)
	Water (Intermittent Releases	10 (mg/L)
	Water (Marine Water)	0,2 (mg/L)
	Sediment (Marine Water)	1,34 (mg/kg sedim. dw)
	Sediment (Freshwater	13,4 (mg/kg sedim. dw)
	Suelo	1,5 (mg/kg soil dw)
	Sewage Treatment Plant (STP)	2,21 (mg/L)

PNEC: Predicted No Effect Concentration, (concentración prevista sin efecto) concentración de la sustancia por debajo de la cual no se esperan efectos negativos en el comportamiento medioambiental.

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**				
Protección respiratoria:					
Si se cumplen las medidas técnicas recomendadas no es necesario ningún equipo de protección individual.					
Protección de las manos:					
EPI:	Guantes de trabajo				
Características:	Marcado «CE» Categoría I.				
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 contra impactos de partículas				
Características:	Marcado «CE» Categoría II. Protector de ojos contra polvo y humos.				
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				
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				
Mantenimiento:	Se deben seguir las instrucciones de lavado y conservación proporcionadas por el fabricante para garantiza una protección invariable.				

-Continúa *en la página siguiente.*-

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 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 trabajor para los cuales es apto este calzado.

SECCIÓN 9: PROPIEDADES FÍSICAS Y QUÍMICAS.

9.1 Información sobre propiedades físicas y químicas básicas.
Aspecto:Sólido blanco
Color: N.D./N.A.
Olor:Inoloro
Umbral olfativo:N.D./N.A.
pH:N.D./N.A.
Punto de Fusión:>300 ºC
Punto/intervalo de ebullición: >300 ºC
Punto de inflamación: N.D./N.A.
Tasa de evaporación: N.D./N.A.
Inflamabilidad (sólido, gas): No
Límite inferior de explosión: No determinado
Límite superior de explosión: No determinado
Presión de vapor: 0.00022 Pa
Densidad de vapor:N.D./N.A.
Densidad relativa:2 g/cm^3
Solubilidad:172 g/l en agua
Liposolubilidad: N.D./N.A.
Hidrosolubilidad: N.D./N.A.
Coeficiente de reparto (n-octanol/agua): <-2.3 log POW (a pH 7)
Temperatura de autoinflamación: 292ºC
Temperatura de descomposición: N.D./N.A.
Viscosidad: N.D./N.A.
Propiedades explosivas: No
Propiedades comburentes: N.D./N.A.
N.D./N.A.= No Disponible/No Aplicable debido a la naturaleza del producto.

9.2 Otros datos.
Punto de Gota: N.D./N.A.
Centelleo: N.D./N.A.
Viscosidad cinemática: 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.
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.

-Continúa *en la página siguiente.*-

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
diformiato de calcio N. CAS: 544-17-2 N. CE: 208-863-7	Oral	DL50	Rata	3050 mg/kg
	Cutánea	LD50	Rata	> 2000 mg/Kg bw
	Inhalación	LC50	Rata	>0.67 mg/l (4h)

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.

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;
Datos no concluyentes para la clasificación.

SECCIÓN 12: INFORMACIÓN ECOLÓGICA.

12.1 Toxicidad.
No se dispone de información relativa a la Ecotoxicidad.

12.2 Persistencia y degradabilidad.

No se dispone de información relativa a la biodegradabilidad.
No se dispone de información relativa a la degradabilidad.

-Continúa *en la página siguiente.*-

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.

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.

No es peligroso en el transporte. En caso de accidente y vertido del producto actuar según el punto 6.
14.1 Número ONU.
No es peligroso en el transporte.

14.2 Designación oficial de transporte de las Naciones Unidas.
Descripción:
ADR: No es peligroso en el transporte.
IMDG: No es peligroso en el transporte.
ICAO/IATA: No es peligroso en el transporte.

14.3 Clase(s) de peligro para el transporte.
No es peligroso en el transporte.

14.4 Grupo de embalaje.
No es peligroso en el transporte.

14.5 Peligros para el medio ambiente.
No es peligroso en el transporte.

14.6 Precauciones particulares para los usuarios.
No es peligroso en el transporte.

14.7 Transporte a granel con arreglo al anexo II del Convenio MARPOL y del Código IBC.
No es peligroso en el transporte.

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

El producto no se encuentra afectado por la Directiva 2012/18/UE (SEVESO III).

-Continúa *en la página siguiente.*-

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:

Eye Dam. 1 : Lesión ocular grave, Categoría 1

Secciones modificadas respecto a la versión anterior:

1,16

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:
CEN: Comité Europeo de Normalización.
DMEL: Derived Minimal Effect Level, nivel de exposición que corresponde a un riesgo bajo, que debe considerarse un riesgo mínimo tolerable.
DNEL: Derived No Effect Level, (nivel sin efecto obtenido) nivel de exposición a la sustancia por debajo del cual no se prevén efectos adversos.
EPI: Equipo de protección personal.
PNEC: Predicted No Effect Concentration, (concentración prevista sin efecto) concentración de la sustancia por debajo de la cual no se esperan efectos negativos en el comportamiento medioambiental.

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.

-Fin *de la ficha de datos de seguridad.*-

Annex Exposure scenarios

1. Manufacture of substance

1.1. Exposure scenario

Manufacture of substance	
Environment:	ERC 1, ERC 6a
Worker	
Use in closed process, no likelihood of exposure	PROC 1
Use in closed, continuous process with occasional controlled exposure	PROC 2
Use in closed batch process (synthesis or formulation)	PROC 3
Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
Use as laboratory reagent	PROC 15
Calendering operations	PROC 6
Operational conditions and risk management measures	

Control of workers exposure for "Use in closed process, no likelihood of exposure" [PROC 1]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed process, no likelihood of exposure		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					

Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in closed, continuous process with occasional controlled exposure" [PROC 2]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed, continuous process with occasional controlled exposure		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in closed batch process (synthesis or formulation) " [PROC 3]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					

Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed batch process (synthesis or formulation)		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in batch and other process (synthesis) where opportunity for exposure arises" [PROC 4]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in batch and other process (synthesis) where opportunity for exposure arises		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities" [PROC 8a]

		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities" [PROC 8b]

		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		

Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation into small containers (dedicated filling line, including weighing) " [PROC 9]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use as laboratory reagent" [PROC 15]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					

Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Calendering operations" [PROC 6]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

1.2. Exposure estimation for Manufacture of substance

1.2.1. Exposure estimation for the environment (Manufacture of substance)

1.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

1.2.1.2. Environmental exposure

Please see above.

1.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The exposure concentrations in air is not calculated with CHESAR but considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Though not calculated with CHESAR, exposure is considered to be negligible.

1.2.2. Exposure estimation for Worker for Use in closed process, no likelihood of exposure

Table 1. Summary of exposure concentrations for contributing scenario: Use in closed process, no likelihood of exposure

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	0.054 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

1.2.2. Exposure estimation for Worker for Use in closed, continuous process with occasional controlled exposure

Table 2. Summary of exposure concentrations for contributing scenario: Use in closed, continuous process with occasional controlled exposure

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	5.421 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	1.371 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

1.2.2. Exposure estimation for Worker for Use in closed batch process (synthesis or formulation)

Table 3. Summary of exposure concentrations for contributing scenario: Use in closed batch process (synthesis or formulation)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation:	16.26 mg/m³	**Method:** TRA workers	

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Long term, Systemic		**Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

1.2.2. Exposure estimation for Worker for Use in batch and other process (synthesis) where opportunity for exposure arises

Table 4. Summary of exposure concentrations for contributing scenario: Use in batch and other process (synthesis) where opportunity for exposure arises

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

1.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Table 5. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

1.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Table 6. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

1.2.2. Exposure estimation for Worker for Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Table 7. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

1.2.2. Exposure estimation for Worker for Use as laboratory reagent

Table 8. Summary of exposure concentrations for contributing scenario: Use as laboratory reagent

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

1.2.2. Exposure estimation for Worker for Calendering operations

Table 9. Summary of exposure concentrations for contributing scenario: Calendering operations

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	27.43 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

2. Distribution and storage

2.1. Exposure scenario

Distribution and storage	
Market sector:	
Environment:	ERC 2
Worker	
Use in closed process, no likelihood of exposure	PROC 1
Use in closed, continuous process with occasional controlled exposure	PROC 2
Use in closed batch process (synthesis or formulation)	PROC 3
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
Use as laboratory reagent	PROC 15
Operational conditions and risk management measures	

Control of workers exposure for "Use in closed process, no likelihood of exposure" [PROC 1]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					

Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed process, no likelihood of exposure		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in closed, continuous process with occasional controlled exposure" [PROC 2]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed, continuous process with occasional controlled exposure		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in closed batch process (synthesis or formulation) " [PROC 3]

		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed batch process (synthesis or formulation)		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) " [PROC 5]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					

Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities" [PROC 8a]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities" [PROC 8b]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					

Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation into small containers (dedicated filling line, including weighing) " [PROC 9]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use as laboratory reagent" [PROC 15]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		

Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

2.2. Exposure estimation for Distribution and storage

2.2.1. Exposure estimation for the environment (Distribution and storage)

2.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

2.2.1.2. Environmental exposure

Please see above

2.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

2.2.2. Exposure estimation for Worker for Use in closed process, no likelihood of exposure

Table 10. Summary of exposure concentrations for contributing scenario: Use in closed process, no likelihood of exposure

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	0.054 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

2.2.2. Exposure estimation for Worker for Use in closed, continuous process with occasional controlled exposure

Table 11. Summary of exposure concentrations for contributing scenario: Use in closed, continuous process with occasional controlled exposure

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	5.421 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	1.371 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

2.2.2. Exposure estimation for Worker for Use in closed batch process (synthesis or formulation)

Table 12. Summary of exposure concentrations for contributing scenario: Use in closed batch process (synthesis or formulation)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	16.26 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

2.2.2. Exposure estimation for Worker for Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Table 13. Summary of exposure concentrations for contributing scenario: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

2.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Table 14. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

2.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Table 15. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

2.2.2. Exposure estimation for Worker for Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Table 16. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

2.2.2. Exposure estimation for Worker for Use as laboratory reagent

Table 17. Summary of exposure concentrations for contributing scenario: Use as laboratory reagent

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

3. Distribution and storage: All formualtions

3.1. Exposure scenario

Distribution and storage	
Market sector:	
Environment:	ERC 2, ERC 3
Worker	
Use in closed process, no likelihood of exposure	PROC 1
Use in closed, continuous process with occasional controlled exposure	PROC 2
Use in closed batch process (synthesis or formulation)	PROC 3
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
Use as laboratory reagent	PROC 15

Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
Industrial spraying	PROC 7
Production of preparations* or articles by tabletting, compression, extrusion, pelletisation	PROC 14
Operational conditions and risk management measures	

Control of workers exposure for "Use in closed process, no likelihood of exposure" [PROC 1]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed process, no likelihood of exposure		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in closed, continuous process with occasional controlled exposure" [PROC 2]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		

Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed, continuous process with occasional controlled exposure		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in closed batch process (synthesis or formulation) " [PROC 3]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed batch process (synthesis or formulation)		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Mixing or blending in batch processes for formulation of preparations

and articles (multistage and/or significant contact) " [PROC 5]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities" [PROC 8a]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					

Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities" [PROC 8b]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation into small containers (dedicated filling line, including weighing) " [PROC 9]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					

Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use as laboratory reagent" [PROC 15]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in batch and other process (synthesis) where opportunity for exposure arises" [PROC 4]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		

Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in batch and other process (synthesis) where opportunity for exposure arises		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Industrial spraying" [PROC 7]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	1 - 4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands and upper wrists (1500 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Production of preparations* or articles by tabletting, compression, extrusion, pelletisation" [PROC 14]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

3.2. Exposure estimation for Distribution and storage

3.2.1. Exposure estimation for the environment (Distribution and storage)

3.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

3.2.1.2. Environmental exposure

Please see above

3.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

3.2.2. Exposure estimation for Worker for Use in closed process, no likelihood of exposure

Table 18. Summary of exposure concentrations for contributing scenario: Use in closed process, no likelihood of exposure

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	0.054 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

3.2.2. Exposure estimation for Worker for Use in closed, continuous process with occasional controlled exposure

Table 19. Summary of exposure concentrations for contributing scenario: Use in closed, continuous process with occasional controlled exposure

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	5.421 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	1.371 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

3.2.2. Exposure estimation for Worker for Use in closed batch process (synthesis or formulation)

Table 20. Summary of exposure concentrations for contributing scenario: Use in closed batch process (synthesis or formulation)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	16.26 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

3.2.2. Exposure estimation for Worker for Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Table 21. Summary of exposure concentrations for contributing scenario: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

3.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Table 22. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

3.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Table 23. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

3.2.2. Exposure estimation for Worker for Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Table 24. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

3.2.2. Exposure estimation for Worker for Use as laboratory reagent

Table 25. Summary of exposure concentrations for contributing scenario: Use as laboratory reagent

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

3.2.2. Exposure estimation for Worker for Use in batch and other process (synthesis) where opportunity for exposure arises

Table 26. Summary of exposure concentrations for contributing scenario: Use in batch and other process (synthesis) where opportunity for exposure arises

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

3.2.2. Exposure estimation for Worker for Industrial spraying

Table 27. Summary of exposure concentrations for contributing scenario: Industrial spraying

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	325.3 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	42.86 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

3.2.2. Exposure estimation for Worker for Production of preparations* or articles by tabletting, compression, extrusion, pelletisation

Table 28. Summary of exposure concentrations for contributing scenario: Production of preparations* or articles by tabletting, compression, extrusion, pelletisation

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.5 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	3.429 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

4. Industrial end-use stage: Adhesives and sealants

4.1. Exposure scenario

Industrial end-use stage	
Market sector:	
Environment:	ERC 5
Worker	
Use in closed process, no likelihood of exposure	PROC 1
Use in closed, continuous process with occasional controlled exposure	PROC 2
Use in closed batch process (synthesis or formulation)	PROC 3
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b

Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
Roller application or brushing	PROC 10
Use as laboratory reagent	PROC 15
Operational conditions and risk management measures	

Control of workers exposure for "Use in closed process, no likelihood of exposure" [PROC 1]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed process, no likelihood of exposure		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in closed, continuous process with occasional controlled exposure" [PROC 2]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		

Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed, continuous process with occasional controlled exposure		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in closed batch process (synthesis or formulation) " [PROC 3]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed batch process (synthesis or formulation)		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Mixing or blending in batch processes for formulation of preparations

and articles (multistage and/or significant contact) " [PROC 5]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities" [PROC 8a]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					

Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities" [PROC 8b]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation into small containers (dedicated filling line, including weighing) " [PROC 9]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					

Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Roller application or brushing" [PROC 10]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use as laboratory reagent" [PROC 15]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		

Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

4.2. Exposure estimation for Industrial end-use stage

4.2.1. Exposure estimation for the environment (Not relevant)

4.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

4.2.1.2. Environmental exposure

Please see above

4.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

4.2.2. Exposure estimation for Worker for Use in closed process, no likelihood of exposure

Table 29. Summary of exposure concentrations for contributing scenario: Use in closed process, no likelihood of exposure

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	0.054 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

4.2.2. Exposure estimation for Worker for Use in closed, continuous process with occasional controlled exposure

Table 30. Summary of exposure concentrations for contributing scenario: Use in closed, continuous process with occasional controlled exposure

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	5.421 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	1.371 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

4.2.2. Exposure estimation for Worker for Use in closed batch process (synthesis or formulation)

Table 31. Summary of exposure concentrations for contributing scenario: Use in closed batch process (synthesis or formulation)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	16.26 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

4.2.2. Exposure estimation for Worker for Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Table 32. Summary of exposure concentrations for contributing scenario: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

4.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Table 33. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

4.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Table 34. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

4.2.2. Exposure estimation for Worker for Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Table 35. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

4.2.2. Exposure estimation for Worker for Roller application or brushing

Table 36. Summary of exposure concentrations for contributing scenario: Roller application or brushing

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	27.43 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

4.2.2. Exposure estimation for Worker for Use as laboratory reagent

Table 37. Summary of exposure concentrations for contributing scenario: Use as laboratory reagent

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

5. Professional end-use stage: Adhesives and sealants

5.1. Exposure scenario

Professional end-use stage	
Market sector:	

Sector of use:	
SU 0 - Other	
SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Environment:	ERC 8c, ERC 8f
Worker	
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
Roller application or brushing	PROC 10
Use as laboratory reagent	PROC 15
Hand-mixing with intimate contact and only PPE available	PROC 19
Operational conditions and risk management measures	

Control of workers exposure for "Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) " [PROC 5]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for

which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities" [PROC 8a]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities" [PROC 8b]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					

Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation into small containers (dedicated filling line, including weighing) " [PROC 9]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Roller application or brushing" [PROC 10]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					

Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use as laboratory reagent" [PROC 15]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Hand-mixing with intimate contact and only PPE available" [PROC 19]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					

Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands and forearms (1980 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

5.2. Exposure estimation for Professional end-use stage

5.2.1. Exposure estimation for the environment (Professional end-use stage)

5.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

5.2.1.2. Environmental exposure

Please see above

5.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

5.2.2. Exposure estimation for Worker for Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Table 38. Summary of exposure concentrations for contributing scenario: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

5.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Table 39. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	135.5 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

5.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Table 40. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

5.2.2. Exposure estimation for Worker for Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Table 41. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

5.2.2. Exposure estimation for Worker for Roller application or brushing

Table 42. Summary of exposure concentrations for contributing scenario: Roller application or brushing

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	135.5 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	27.43 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

5.2.2. Exposure estimation for Worker for Use as laboratory reagent

Table 43. Summary of exposure concentrations for contributing scenario: Use as laboratory reagent

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

5.2.2. Exposure estimation for Worker for Hand-mixing with intimate contact and only PPE available

Table 44. Summary of exposure concentrations for contributing scenario: Hand-mixing with intimate contact and only PPE available

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	135.5 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	5 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	141.4 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

6. Consumer end-use: Adhesives and sealants

6.1. Exposure scenario

Consumer end-use	
Market sector:	
Environment:	ERC 8c, ERC 8f, ERC 10a, ERC 11a
Consumer	
Operational conditions and risk management measures	

6.2. Exposure estimation for Consumer end-use

6.2.1. Exposure estimation for the environment (Consumer end-use)

6.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

6.2.1.2. Environmental exposure

Please see above

6.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

7. Professional end-use stage: Fillers and putties

7.1. Exposure scenario

Professional end-use stage	
Market sector:	
PC 9b - Fillers, Putties	
Sector of use:	
SU 0 - Other	
SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Environment:	ERC 8c, ERC 8f
Worker	
Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
Roller application or brushing	PROC 10
Treatment of articles by dipping and pouring	PROC 13
Operational conditions and risk management measures	

Control of workers exposure for "Transfer of substance or preparation into small containers (dedicated filling line, including weighing) " [PROC 9]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Roller application or brushing" [PROC 10]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Treatment of articles by dipping and pouring" [PROC 13]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					

Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

7.2. Exposure estimation for Professional end-use stage

7.2.1. Exposure estimation for the environment (Professional end-use stage)

7.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

7.2.1.2. Environmental exposure

Please see above.

7.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

Environmental exposure concentrations were not calculated with CHESAR but are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Though not calculated with CHESAR, exposure is considered to be negligible.

7.2.2. Exposure estimation for Worker for Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Table 45. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

7.2.2. Exposure estimation for Worker for Roller application or brushing

Table 46. Summary of exposure concentrations for contributing scenario: Roller application or brushing

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	135.5 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	27.43 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

7.2.2. Exposure estimation for Worker for Treatment of articles by dipping and pouring

Table 47. Summary of exposure concentrations for contributing scenario: Treatment of articles by dipping and pouring

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

8. Consumer end-use: Fillers and putties

8.1. Exposure scenario

Consumer end-use	
Market sector:	
PC 9b - Fillers, Putties	
Environment:	ERC 8c, ERC 8f, ERC 10a, ERC 11a
Consumer	
Operational conditions and risk management measures	

8.2. Exposure estimation for Consumer end-use

8.2.1. Exposure estimation for the environment (Consumer end-use)

8.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore

according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

8.2.1.2. Environmental exposure

Please see above

8.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

9. Industrial end-use stage: Mortar

9.1. Exposure scenario

Industrial end-use stage	
Market sector:	
PC 0 - Other	
Sector of use:	
SU 13 - Manufacture of other non-metallic mineral products, e.g. plasters, cement	
n/a	
Environment:	ERC 5
Worker	
Use in closed process, no likelihood of exposure	PROC 1
Use in closed, continuous process with occasional controlled exposure	PROC 2
Use in closed batch process (synthesis or formulation)	PROC 3
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
Roller application or brushing	PROC 10
Use as laboratory reagent	PROC 15
Treatment of articles by dipping and pouring	PROC 13
Production of preparations or articles by tabletting, compression, extrusion, pelletisation	PROC 14
Low energy manipulation of substances bound in materials and/or articles	PROC 21
Potentially closed processing opera-tions with minerals/metals at elevated temperature. Industrial setting	PROC 22
Operational conditions and risk management measures	

Control of workers exposure for "Use in closed process, no likelihood of exposure" [PROC 1]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed process, no likelihood of exposure		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in closed, continuous process with occasional controlled exposure" [PROC 2]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					

Level of containment	Use in closed, continuous process with occasional controlled exposure		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in closed batch process (synthesis or formulation) " [PROC 3]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed batch process (synthesis or formulation)		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) " [PROC 5]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					

Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities" [PROC 8a]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities" [PROC 8b]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Roller application or brushing" [PROC 10]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					

Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use as laboratory reagent" [PROC 15]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Treatment of articles by dipping and pouring" [PROC 13]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		

Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Production of preparations or articles by tabletting, compression, extrusion, pelletisation" [PROC 14]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Low energy manipulation of substances bound in materials and/or articles" [PROC 21]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		

Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands and forearms (1980 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Potentially closed processing opera-tions with minerals/metals at elevated temperature. Industrial setting" [PROC 22]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Process temperature	Process temp < Melting point		L		
Place of use	Indoors		L		
Surface of skin exposed	Two hands and forearms (1980 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

9.2. Exposure estimation for Industrial end-use stage

9.2.1. Exposure estimation for the environment (Not relevant)

9.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

9.2.1.2. Environmental exposure

Please see above

9.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

9.2.2. Exposure estimation for Worker for Use in closed process, no likelihood of exposure

Table 48. Summary of exposure concentrations for contributing scenario: Use in closed process, no likelihood of exposure

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	0.054 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

9.2.2. Exposure estimation for Worker for Use in closed, continuous process with occasional controlled exposure

Table 49. Summary of exposure concentrations for contributing scenario: Use in closed, continuous process with occasional controlled exposure

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	5.421 mg/m³	**Method:** TRA workers **Name:** TRA workers	

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Dermal: Long term, Local	0.2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	1.371 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

9.2.2. Exposure estimation for Worker for Use in closed batch process (synthesis or formulation)

Table 50. Summary of exposure concentrations for contributing scenario: Use in closed batch process (synthesis or formulation)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	16.26 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

9.2.2. Exposure estimation for Worker for Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Table 51. Summary of exposure concentrations for contributing scenario: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

9.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Table 52. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

9.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Table 53. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

9.2.2. Exposure estimation for Worker for Roller application or brushing

Table 54. Summary of exposure concentrations for contributing scenario: Roller application or brushing

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	27.43 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

9.2.2. Exposure estimation for Worker for Use as laboratory reagent

Table 55. Summary of exposure concentrations for contributing scenario: Use as laboratory reagent

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

9.2.2. Exposure estimation for Worker for Treatment of articles by dipping and pouring

Table 56. Summary of exposure concentrations for contributing scenario: Treatment of articles by dipping and pouring

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

9.2.2. Exposure estimation for Worker for Production of preparations or articles by tabletting, compression, extrusion, pelletisation

Table 57. Summary of exposure concentrations for contributing scenario: Production of preparations or articles by tabletting, compression, extrusion, pelletisation

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.5 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	3.429 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

9.2.2. Exposure estimation for Worker for Low energy manipulation of substances bound in materials and/or articles

9.2.2. Exposure estimation for Worker for Potentially closed processing opera-tions with minerals/metals at elevated temperature. Industrial setting

10. Professional end-use stage: Mortar

10.1. Exposure scenario

Professional end-use stage	
Market sector:	
PC 0 - Other	
Sector of use:	
SU 0 - Other	
SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Environment:	ERC 8a, ERC 8b, ERC 8c, ERC 8f
Worker	
Roller application or brushing	PROC 10
Non industrial spraying	PROC 11
Treatment of articles by dipping and pouring	PROC 13
Hand-mixing with intimate contact and only PPE available	PROC 19
Operational conditions and risk management measures	

Control of workers exposure for "Roller application or brushing" [PROC 10]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for

which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Non industrial spraying" [PROC 11]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	1 - 4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands and upper wrists (1500 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Treatment of articles by dipping and pouring" [PROC 13]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					

Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Hand-mixing with intimate contact and only PPE available" [PROC 19]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands and forearms (1980 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

10.2. Exposure estimation for Professional end-use stage

10.2.1. Exposure estimation for the environment (Professional end-use stage)

10.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

10.2.1.2. Environmental exposure

Please see above

10.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

10.2.2. Exposure estimation for Worker for Roller application or brushing

Table 58. Summary of exposure concentrations for contributing scenario: Roller application or brushing

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	135.5 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	27.43 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

10.2.2. Exposure estimation for Worker for Non industrial spraying

Table 59. Summary of exposure concentrations for contributing scenario: Non industrial spraying

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	325.3 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	5 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	107.1 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

10.2.2. Exposure estimation for Worker for Treatment of articles by dipping and pouring

Table 60. Summary of exposure concentrations for contributing scenario: Treatment of articles by dipping and pouring

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

10.2.2. Exposure estimation for Worker for Hand-mixing with intimate contact and only PPE available

Table 61. Summary of exposure concentrations for contributing scenario: Hand-mixing with intimate contact and only PPE available

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	135.5 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	5 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	141.4 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

11. Consumer end-use: Mortar

11.1. Exposure scenario

Consumer end-use	
Market sector:	
PC 0 - Other	
Environment:	ERC 8a, ERC 8b, ERC 8c, ERC 8f, ERC 10a, ERC 11a
Consumer	
Operational conditions and risk management measures	

11.2. Exposure estimation for Consumer end-use

11.2.1. Exposure estimation for the environment (Consumer end-use)

11.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

11.2.1.2. Environmental exposure

Please see above

11.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

12. Industrial end-use stage: Leather tanning, dye, finishing, impregnation and care products

12.1. Exposure scenario

Industrial end-use stage	
Market sector:	
PC 23 - Leather tanning, dye, finishing, impregnation and care products	
Sector of use:	
SU 5 - Manufacture of textiles, leather, fur	
Environment:	ERC 4, ERC 6b
Worker	
Use in closed process, no likelihood of exposure	PROC 1
Use in closed, continuous process with occasional controlled exposure	PROC 2
Use in closed batch process (synthesis or formulation)	PROC 3
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
Roller application or brushing	PROC 10
Use as laboratory reagent	PROC 15
Treatment of articles by dipping and pouring	PROC 13
Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
Industrial spraying	PROC 7
Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
Operational conditions and risk management measures	

Control of workers exposure for "Use in closed process, no likelihood of exposure" [PROC 1]		
	Inhal*)	Derm*)

		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed process, no likelihood of exposure		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in closed, continuous process with occasional controlled exposure" [PROC 2]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed, continuous process with occasional controlled exposure		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					

Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in closed batch process (synthesis or formulation) " [PROC 3]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed batch process (synthesis or formulation)		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) " [PROC 5]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					

Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities" [PROC 8a]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities" [PROC 8b]				
	Inhal*)		Derm*)	
	Loc	Sys	Loc	Sys

Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Roller application or brushing" [PROC 10]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use as laboratory reagent" [PROC 15]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Treatment of articles by dipping and pouring" [PROC 13]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					

Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use in batch and other process (synthesis) where opportunity for exposure arises" [PROC 4]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in batch and other process (synthesis) where opportunity for exposure arises		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Industrial spraying" [PROC 7]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	1 - 4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					

Place of use	Indoors		L		
Surface of skin exposed	Two hands and upper wrists (1500 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation into small containers (dedicated filling line, including weighing) " [PROC 9]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

12.2. Exposure estimation for Industrial end-use stage

12.2.1. Exposure estimation for the environment (Not relevant)

12.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of

the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

12.2.1.2. Environmental exposure

Please see above

12.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

12.2.2. Exposure estimation for Worker for Use in closed process, no likelihood of exposure

Table 62. Summary of exposure concentrations for contributing scenario: Use in closed process, no likelihood of exposure

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	0.054 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

12.2.2. Exposure estimation for Worker for Use in closed, continuous process with occasional controlled exposure

Table 63. Summary of exposure concentrations for contributing scenario: Use in closed, continuous process with occasional controlled exposure

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	5.421 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	1.371 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

12.2.2. Exposure estimation for Worker for Use in closed batch process (synthesis or formulation)

Table 64. Summary of exposure concentrations for contributing scenario: Use in closed batch process (synthesis or formulation)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	16.26 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

12.2.2. Exposure estimation for Worker for Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Table 65. Summary of exposure concentrations for contributing scenario: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

12.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Table 66. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

12.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Table 67. Summary of exposure concentrations for contributing scenario: Transfer of substance or

preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

12.2.2. Exposure estimation for Worker for Roller application or brushing

Table 68. Summary of exposure concentrations for contributing scenario: Roller application or brushing

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	27.43 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

12.2.2. Exposure estimation for Worker for Use as laboratory reagent

Table 69. Summary of exposure concentrations for contributing scenario: Use as laboratory reagent

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

12.2.2. Exposure estimation for Worker for Treatment of articles by dipping and pouring

Table 70. Summary of exposure concentrations for contributing scenario: Treatment of articles by dipping and pouring

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

12.2.2. Exposure estimation for Worker for Use in batch and other process (synthesis) where opportunity for exposure arises

Table 71. Summary of exposure concentrations for contributing scenario: Use in batch and other process (synthesis) where opportunity for exposure arises

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

12.2.2. Exposure estimation for Worker for Industrial spraying

Table 72. Summary of exposure concentrations for contributing scenario: Industrial spraying

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	325.3 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	42.86 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

12.2.2. Exposure estimation for Worker for Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Table 73. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

13. Professional end-use stage: Fertiliser

13.1. Exposure scenario

Professional end-use stage	
Market sector:	
PC 12 - Fertilizers	
Sector of use:	
SU 1 - Agriculture, forestry, fishery	
Environment:	ERC 8d, ERC 10b
Worker	
Use in closed process, no likelihood of exposure	PROC 1
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facili-ties	PROC 8b
Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
Operational conditions and risk management measures	

Control of workers exposure for "Use in closed process, no likelihood of exposure" [PROC 1]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		

Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed process, no likelihood of exposure		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities" [PROC 8a]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facili-ties" [PROC 8b]				
	Inhal*)		Derm*)	
	Loc	Sys	Loc	Sys

Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation into small containers (dedicated filling line, including weighing) " [PROC 9]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

13.2. Exposure estimation for Professional end-use stage

13.2.1. Exposure estimation for the environment (Professional end-use stage)

13.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

13.2.1.2. Environmental exposure

Please see above

13.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

13.2.2. Exposure estimation for Worker for Use in closed process, no likelihood of exposure

Table 74. Summary of exposure concentrations for contributing scenario: Use in closed process, no likelihood of exposure

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	0.054 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

13.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Table 75. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	135.5 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers	

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
		Name: TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

13.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facili-ties

Table 76. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facili-ties

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

13.2.2. Exposure estimation for Worker for Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Table 77. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	6.857 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

14. Consumer end-use stage: Fertiliser

14.1. Exposure scenario

Consumer end-use stage [edit]	
Market sector:	
PC 12 - Fertilizers	

Environment:	ERC 8d, ERC 10b
Consumer	
Operational conditions and risk management measures	

14.2. Exposure estimation for Consumer end-use stage [edit]

14.2.1. Exposure estimation for the environment (Consumer end-use stage [edit])

14.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

14.2.1.2. Environmental exposure

Please see above

14.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

15. Industrial end-use stage: Glass and ceramics

15.1. Exposure scenario

Industrial end-use stage	
Market sector:	
PC 0 - Other	
Sector of use:	
SU 0 - Other	
SU 3	
Environment:	ERC 5
Worker	
Use in closed batch process (synthesis or formulation)	PROC 3
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Operational conditions and risk management measures	

Control of workers exposure for "Use in closed batch process (synthesis or formulation) " [PROC 3]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	One hand face only (240 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Level of containment	Use in closed batch process (synthesis or formulation)		L		
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) " [PROC 5]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands face (480 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					

Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities" [PROC 8a]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

15.2. Exposure estimation for Industrial end-use stage

15.2.1. Exposure estimation for the environment (Not relevant)

15.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

15.2.1.2. Environmental exposure

Please see above.

15.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

Environmental exposure concentrations were not calculated with CHESAR but are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Though not calculated with CHESAR, exposure is considered to be negligible.

15.2.2. Exposure estimation for Worker for Use in closed batch process (synthesis or formulation)

Table 78. Summary of exposure concentrations for contributing scenario: Use in closed batch process (synthesis or formulation)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	16.26 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	0.1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	0.343 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

15.2.2. Exposure estimation for Worker for Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Table 79. Summary of exposure concentrations for contributing scenario: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	27.11 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

15.2.2. Exposure estimation for Worker for Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Table 80. Summary of exposure concentrations for contributing scenario: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	54.21 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	1 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	13.71 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

16. Service life stage (consumers): Glass and ceramics

16.1. Exposure scenario

Service life stage (consumers)	
Market sector:	
PC 0 - Other	
Environment:	ERC 10a, ERC 11a
Consumer	
Operational conditions and risk management measures	

16.2. Exposure estimation for Service life stage (consumers)

16.2.1. Exposure estimation for the environment (Service life stage (consumers))

16.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

16.2.1.2. Environmental exposure

Please see above

16.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

17. Professional end-use stage: Washing and cleaning products; health services

17.1. Exposure scenario

Professional end-use stage	
Market sector:	
PC 35 - Washing and Cleaning Products (including solvent based products)	
Sector of use:	
SU 20 - Health services	
Environment:	ERC 8a
Worker	
Professional use [edit]	PROC 10
Operational conditions and risk management measures	

Control of workers exposure for "Professional use [edit]" [PROC 10]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

17.2. Exposure estimation for Professional end-use stage

17.2.1. Exposure estimation for the environment (Professional end-use stage)

17.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of

the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

17.2.1.2. Environmental exposure

Please sse above

17.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

17.2.2. Exposure estimation for Worker for Professional use [edit]

Table 81. Summary of exposure concentrations for contributing scenario: Professional use [edit]

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	135.5 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	27.43 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	

18. Professional end-use stage: Washing and cleaning products; Public domain

18.1. Exposure scenario

Professional end-use stage	
Market sector:	
PC 35 - Washing and Cleaning Products (including solvent based products)	
Sector of use:	
SU 0 - Other	
SU 22	
Environment:	ERC 8a
Worker	
Professional use	PROC 10
Operational conditions and risk management measures	

Control of workers exposure for "Professional use" [PROC 10]					
		Inhal*)		Derm*)	
		Loc	Sys	Loc	Sys
Product characteristics					
Substance in preparation	No		L		
Amounts used					
Frequency and duration of use/exposure					
Duration of activity	>4 hours		L		
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Place of use	Indoors		L		
Surface of skin exposed	Two hands (960 cm2)			L	L
Technical conditions and measures at process level (source) to prevent release					
Technical conditions and measures to control dispersion from source towards the worker					
Local Exhaust Ventilation	No		L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection	Respiratory protection is not used		L		
Additional good practice advice beyond the REACH CSA					

*) The route of exposure (**Inhal**ation, **Derm**al) and type of effect (**Loc**al, **Sys**temic and **A**cute or **L**ong term) for which the determinant has been used for exposure estimation are reported.

18.2. Exposure estimation for Professional end-use stage

18.2.1. Exposure estimation for the environment (Professional end-use stage)

18.2.1.1. Environmental releases

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified. Therefore according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for the environment and therefore, no environmental exposure assessment is performed.

18.2.1.2. Environmental exposure

Please see above

18.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The environmental exposure concentrations are considered to be negligible.

Exposure via food consumption: Total daily intake for humans

The chemical is water soluble, readily biodegradable and does not accumulate in the food chain. Therefore secondary poisoning and exposure via the food chain are not relevant.

18.2.2. Exposure estimation for Worker for Professional use

Table 82. Summary of exposure concentrations for contributing scenario: Professional use

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	135.5 mg/m³	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Local	2 mg/cm²	**Method:** TRA workers **Name:** TRA workers	
Dermal: Long term, Systemic	27.43 mg/kg bw/day	**Method:** TRA workers **Name:** TRA workers	