901143 - ACIDO MALICO GRANULAR 20/25 MESH

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

1.1 Identificador del producto: 901143 - ACIDO MALICO GRANULAR 20/25 MESH

Acido DL-malico

CAS: 617-48-1

CE: 210-514-9

Index: No aplicable

REACH: 01-2119552463-40-XXXX

Otros medios de identificación:

No relevante

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

Usos pertinentes: Aditivo alimentario. Uso exclusivo usuario profesional/usuario industrial.

Usos desaconsejados: Todo aquel uso no especificado en este epígrafe ni en el epígrafe 7.3

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

Quimidroga S.A.
C/ Tuset, 26
08006 Barcelona - Spain
Tfno.: +34 932363636 - Fax: +34 934154880
msds@quimidroga.com
www.quimidroga.com

1.4 Teléfono de emergencia: +34 932363636 (24h)

SECCIÓN 2: IDENTIFICACIÓN DE LOS PELIGROS

2.1 Clasificación de la sustancia o de la mezcla:

Reglamento nº1272/2008 (CLP):

La clasificación de este producto se ha realizado conforme el Reglamento nº1272/2008 (CLP).

Eye Irrit. 2: Irritación ocular, categoría 2, H319

2.2 Elementos de la etiqueta:

Reglamento nº1272/2008 (CLP):

Atención

Indicaciones de peligro:

Eye Irrit. 2: H319 - Provoca irritación ocular grave.

Consejos de prudencia:

P264: Lavarse concienzudamente tras la manipulación.
P280: Llevar guantes de protección/prendas de protección/protección respiratoria/gafas de protección/calzado 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.
P337+P313: Si persiste la irritación ocular: Consultar a un médico.

2.3 Otros peligros:

El producto no cumple los criterios PBT/vPvB
El producto no cumple los criterios por sus propiedades de alteración endocrina.

SECCIÓN 3: COMPOSICIÓN/INFORMACIÓN SOBRE LOS COMPONENTES

3.1 Sustancia:

Descripción química: Ácidos carboxílicos

Componentes:

De acuerdo al Anexo II del Reglamento (CE) nº1907/2006 (punto 3), el producto presenta:

- CONTINÚA EN LA SIGUIENTE PÁGINA -

SECCIÓN 3: COMPOSICIÓN/INFORMACIÓN SOBRE LOS COMPONENTES (continúa)

Identificación	Nombre químico/clasificación		Concentración
CAS: 617-48-1 CE: 210-514-9 Index: No aplicable REACH: 01-2119552463-40-XXXX	**Acido DL-malico**	Autoclasificada	**100 %**
	Reglamento 1272/2008	Eye Irrit. 2: H319 - Atención	

Para ampliar información sobre la peligrosidad de las sustancias consultar las secciones 11, 12 y 16.

3.2 Mezclas:

No aplicable

SECCIÓN 4: PRIMEROS AUXILIOS

4.1 Descripción de los primeros auxilios:

Los síntomas como consecuencia de una intoxicación pueden presentarse con posterioridad a la exposición, por lo que, en caso de duda, exposición directa al producto químico o persistencia del malestar solicitar atención médica, mostrándole la FDS de este producto.

Por inhalación:

Se trata de un producto que no contiene sustancias clasificadas como peligrosas por inhalación, sin embargo, en caso de síntomas de intoxicación sacar al afectado de la zona de exposición y proporcionarle aire fresco. Solicitar atención médica si los síntomas se agravan o persisten.

Por contacto con la piel:

En caso de contacto se recomienda limpiar la zona afecta con agua por arrastre y con jabón neutro. En caso de alteraciones en la piel (escozor, rojez, sarpullidos, ampollas…), acudir a consulta médica con esta Ficha de Datos de Seguridad

Por contacto con los ojos:

Enjuagar los ojos con abundante agua a temperatura ambiente al menos durante 15 minutos. Evitar que el afectado se frote o cierre los ojos. En el caso de que el accidentado use lentes de contacto, éstas deben retirarse siempre que no estén pegadas a los ojos, de otro modo podría producirse un daño adicional. En todos los casos, después del lavado, se debe acudir al médico lo más rápidamente posible con la FDS del producto.

Por ingestión/aspiración:

En caso de ingestión, solicitar asistencia médica inmediata mostrando la FDS de este producto.

4.2 Principales síntomas y efectos, agudos y retardados:

Los efectos agudos y retardados son los indicados en las secciones 2 y 11.

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

No relevante

SECCIÓN 5: MEDIDAS DE LUCHAS CONTRA INCENDIOS

5.1 Medios de extinción:

Medios de extinción apropiados:

Producto no inflamable bajo condiciones normales de almacenamiento, manipulación y uso. En caso de inflamación como consecuencia de manipulación, almacenamiento o uso indebido emplear preferentemente extintores de polvo polivalente (polvo ABC), de acuerdo al Reglamento de instalaciones de protección contra incendios (R.D. 513/2017 y posteriores modificaciones).

Medios de extinción no apropiados:

No relevante

5.2 Peligros específicos derivados de la sustancia o la mezcla:

Como consecuencia de la combustión o descomposición térmica se generan subproductos de reacción que pueden resultar altamente tóxicos y, consecuentemente, pueden presentar un riesgo elevado para la salud.

5.3 Recomendaciones para el personal de lucha contra incendios:

En función de la magnitud del incendio puede hacerse necesario el uso de ropa protectora completa y equipo de respiración autónomo. Disponer de un mínimo de instalaciones de emergencia o elementos de actuación (mantas ignífugas, botiquín portátil,...) conforme al R.D.486/1997 y posteriores modificaciones

Disposiciones adicionales:

- CONTINÚA EN LA SIGUIENTE PÁGINA -

SECCIÓN 5: MEDIDAS DE LUCHAS CONTRA INCENDIOS (continúa)

Actuar conforme el Plan de Emergencia Interior y las Fichas Informativas sobre actuación ante accidentes y otras emergencias. Suprimir cualquier fuente de ignición. En caso de incendio, refrigerar los recipientes y tanques de almacenamiento de productos susceptibles a inflamación, explosión o BLEVE como consecuencia de elevadas temperaturas. Evitar el vertido de los productos empleados en la extinción del incendio al medio acuático.

SECCIÓN 6: MEDIDAS EN CASO DE VERTIDO ACCIDENTAL

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

Para el personal que no forma parte de los servicios de emergencia:

Barrer y recoger el producto con palas u otros medios e introducirlo en un recipiente para su reutilización (preferentemente) o su eliminación.

Para el personal de emergencia:

Llevar puesto equipo de protección. Mantener alejadas las personas sin protección. Ver sección 8.

6.2 Precauciones relativas al medio ambiente:

Producto no clasificado como peligroso para el medioambiente. Mantener el producto alejado de los desagües y de las aguas superficiales y subterráneas.

6.3 Métodos y material de contención y de limpieza:

Se recomienda:

Barrer y recoger el producto con palas u otros medios e introducirlo en un recipiente para su reutilización (preferentemente) o su eliminación.

6.4 Referencias a otras secciones:

Ver secciones 8 y 13.

SECCIÓN 7: MANIPULACIÓN Y ALMACENAMIENTO

7.1 Precauciones para una manipulación segura:

A.- Precauciones generales

Cumplir con la legislación vigente en materia de prevención de riesgos laborales en cuanto a manipulación manual de cargas. Mantener orden, limpieza y eliminar por métodos seguros (sección 6).

B.- Recomendaciones técnicas para la prevención de incendios y explosiones.

Debido a sus características de inflamabilidad, el producto no presenta riesgo de incendio bajo condiciones normales de almacenamiento, manipulación y uso.

C.- Recomendaciones técnicas para prevenir riesgos ergonómicos y toxicológicos.

Para control de exposición consultar la sección 8. No comer, beber ni fumar en las zonas de trabajo; lavarse las manos después de cada utilización, y despojarse de prendas de vestir y equipos de protección contaminados antes de entrar en las zonas para comer.

D.- Recomendaciones técnicas para prevenir riesgos medioambientales

Se recomienda disponer de material absorbente en las proximidades del producto (ver epígrafe 6.3)

7.2 Condiciones de almacenamiento seguro, incluidas posibles incompatibilidades:

A.- Medidas técnicas de almacenamiento

ITC (R.D.656/2017):	No relevante
Clasificación:	No relevante
Temperatura mínima:	5 ºC
Temperatura máxima:	30 ºC
Tiempo máximo:	6 meses

B.- Condiciones generales de almacenamiento.

Evitar fuentes de calor, radiación, electricidad estática y el contacto con alimentos. Para información adicional ver epígrafe 10.5

7.3 Usos específicos finales:

- CONTINÚA EN LA SIGUIENTE PÁGINA -

SECCIÓN 7: MANIPULACIÓN Y ALMACENAMIENTO (continúa)

Salvo las indicaciones ya especificadas no es preciso realizar ninguna recomendación especial en cuanto a los usos de este producto.

SECCIÓN 8: CONTROLES DE EXPOSICIÓN/PROTECCIÓN INDIVIDUAL

8.1 Parámetros de control:

Sustancias cuyos valores límite de exposición profesional han de controlarse en el ambiente de trabajo:

Partículas no especificadas de otra forma: Fracción inhalable VLA-ED= 10 mg/m3 // Fracción respirable VLA-ED= 3 mg/m3

DNEL (Trabajadores):

		Corta exposición		Larga exposición	
Identificación		Sistémica	Local	Sistémica	Local
Acido DL-malico	Oral	No relevante	No relevante	No relevante	No relevante
CAS: 617-48-1	Cutánea	40 mg/kg	No relevante	2 mg/kg	No relevante
CE: 210-514-9	Inhalación	104 mg/m³	104 mg/m³	5,33 mg/m³	32 mg/m³

DNEL (Población):

		Corta exposición		Larga exposición	
Identificación		Sistémica	Local	Sistémica	Local
Acido DL-malico	Oral	20 mg/kg	No relevante	6 mg/kg	No relevante
CAS: 617-48-1	Cutánea	20 mg/kg	No relevante	6 mg/kg	No relevante
CE: 210-514-9	Inhalación	52 mg/m³	52 mg/m³	1,6 mg/m³	1,6 mg/m³

PNEC:

Identificación				
Acido DL-malico	STP	3 mg/L	Agua dulce	0,1 mg/L
CAS: 617-48-1	Suelo	No relevante	Agua salada	0,01 mg/L
CE: 210-514-9	Intermitente	1 mg/L	Sedimento (Agua dulce)	No relevante
	Oral	No relevante	Sedimento (Agua salada)	No relevante

8.2 Controles de la exposición:

A.- Medidas de protección individual, tales como equipos de protección personal

Como medida de prevención se recomienda la utilización de equipos de protección individual básicos, con el correspondiente marcado CE de acuerdo al R.D.1407/1992 y posteriores modificaciones. Para más información sobre los equipos de protección individual (almacenamiento, uso, limpieza, mantenimiento, clase de protección,…) consultar el folleto informativo facilitado por el fabricante del EPI. Las indicaciones contenidas en este punto se refieren al producto puro. Las medidas de protección para el producto diluido podrán variar en función de su grado de dilución, uso, método de aplicación, etc. Para determinar la obligación de instalación de duchas de emergencia y/o lavaojos en los almacenes se tendrá en cuenta la normativa referente al almacenamiento de productos químicos aplicable en cada caso. Para más información ver epígrafes 7.1 y 7.2.
Toda la información aquí incluida es una recomendación siendo necesario su concreción por parte de los servicios de prevención de riesgos laborales al desconocer las medidas de prevención adicionales que la empresa pudiese disponer o si han sido incluidos en la evaluación de riesgos pertinentes.

B.- Protección respiratoria.

Pictograma	EPI	Marcado	Normas CEN	Observaciones
 Uso obligatorio de mascarilla	Mascarilla autofiltrante para partículas	CE CAT III	EN 149:2001+A1:2009	Reemplazar cuando se note un aumento de la resistencia a la respiración.

C.- Protección específica de las manos.

Pictograma	EPI	Marcado	Normas CEN	Observaciones
 Protección obligatoria de la manos	Guantes de protección contra riesgos menores	CE CAT I		Reemplazar los guantes ante cualquier indicio de deterioro. Para periodos de exposición prolongados al producto para usuarios profesionales/industriales se hace recomendable la utilización de guantes CE III, de acuerdo a las normas EN 420:2004+ A1:2010 y EN ISO 374-1:2016+A1:2018

- CONTINÚA EN LA SIGUIENTE PÁGINA -

SECCIÓN 8: CONTROLES DE EXPOSICIÓN/PROTECCIÓN INDIVIDUAL (continúa)

D.- Protección ocular y facial

Pictograma	EPI	Marcado	Normas CEN	Observaciones
 Protección obligatoria de la cara	Gafas panorámicas contra salpicaduras y/o proyecciones	CE CAT II	EN 166:2002 EN ISO 4007:2018	Limpiar a diario y desinfectar periódicamente de acuerdo a las instrucciones del fabricante. Se recomienda su uso en caso de riesgo de salpicaduras.

E.- Protección corporal

Pictograma	EPI	Marcado	Normas CEN	Observaciones
	Ropa de trabajo	CE CAT I		Reemplazar ante cualquier indicio de deterioro. Para periodos de exposición prolongados al producto para usuarios profesionales/industriales se hace recomendable CE III, de acuerdo a las normas EN ISO 6529:2013, EN ISO 6530:2005, EN ISO 13688:2013, EN 464:1994
	Calzado de trabajo antideslizamiento	CE CAT II	EN ISO 20347:2012	Reemplazar ante cualquier indicio de deterioro. Para periodos de exposición prolongados al producto para usuarios profesionales/industriales se hace recomendable CE III, de acuerdo a las normas EN ISO 20345:2012 y EN 13832-1:2007

F.- Medidas complementarias de emergencia

Medida de emergencia	Normas	Medida de emergencia	Normas
 Ducha de emergencia	ANSI Z358-1 ISO 3864-1:2011, ISO 3864-4:2011	 Lavaojos	DIN 12 899 ISO 3864-1:2011, ISO 3864-4:2011

Controles de exposición medioambiental:

En virtud de la legislación comunitaria de protección del medio ambiente se recomienda evitar el vertido tanto del producto como de su envase al medio ambiente. Para información adicional ver epígrafe 7.1.D

Compuestos orgánicos volátiles:

En aplicación al R.D.117/2003 y posteriores modificaciones (Directiva 2010/75/EU), este producto presenta las siguientes características:

C.O.V. (Suministro):	0 % peso
Concentración C.O.V. a 20 ºC:	0 kg/m³ (0 g/L)
Número de carbonos medio:	No relevante
Peso molecular medio:	No relevante

SECCIÓN 9: PROPIEDADES FÍSICAS Y QUÍMICAS

9.1 Información de propiedades físicas y químicas básicas:

Para completar la información ver la ficha técnica/hoja de especificaciones del producto.

Aspecto físico:

Estado físico a 20 ºC:	Sólido
Aspecto:	Granulado
Color:	☐ Blanco
Olor:	Inodoro
Umbral olfativo:	No relevante *

Volatilidad:

Temperatura de ebullición a presión atmosférica:	No relevante *
Presión de vapor a 20 ºC:	No relevante *
Presión de vapor a 50 ºC:	No relevante *

*No relevante debido a la naturaleza del producto, no aportando información característica de su peligrosidad.

- CONTINÚA EN LA SIGUIENTE PÁGINA -

SECCIÓN 9: PROPIEDADES FÍSICAS Y QUÍMICAS (continúa)

Tasa de evaporación a 20 ºC:	No relevante *
Caracterización del producto:	
Densidad a 20 ºC:	No relevante *
Densidad relativa a 20 ºC:	No relevante *
Viscosidad dinámica a 20 ºC:	No relevante *
Viscosidad cinemática a 20 ºC:	No relevante *
Viscosidad cinemática a 40 ºC:	No relevante *
Concentración:	No relevante *
pH:	No relevante *
Densidad de vapor a 20 ºC:	No relevante *
Coeficiente de reparto n-octanol/agua a 20 ºC:	-1,26
Solubilidad en agua a 20 ºC:	558 kg/m³
Propiedad de solubilidad:	No relevante *
Temperatura de descomposición:	No relevante *
Punto de fusión/punto de congelación:	127 - 132 ºC
Inflamabilidad:	
Punto de inflamación:	203 ºC
Inflamabilidad (sólido, gas):	No relevante *
Temperatura de auto-inflamación:	349 ºC
Límite de inflamabilidad inferior:	No relevante *
Límite de inflamabilidad superior:	No relevante *
Explosividad (Sólido):	
Límite inferior de explosividad:	No relevante *
Límite superior de explosividad:	No relevante *
Características de las partículas:	
Diámetro medio equivalente:	No relevante *

9.2 Otros datos:

Información relativa a las clases de peligro físico:	
Propiedades explosivas:	No relevante *
Propiedades comburentes:	No relevante *
Corrosivos para los metales:	No relevante *
Calor de combustión:	No relevante *
Aerosoles-porcentaje total (en masa) de componentes inflamables:	No relevante *
Otras características de seguridad:	
Tensión superficial a 20 ºC:	No relevante *
Índice de refracción:	No relevante *

*No relevante debido a la naturaleza del producto, no aportando información característica de su peligrosidad.

SECCIÓN 10: ESTABILIDAD Y REACTIVIDAD

10.1 Reactividad:

No se esperan reacciones peligrosas si se cumplen las instrucciones técnicas de almacenamiento de productos químicos. Ver sección 7.

10.2 Estabilidad química:

Estable químicamente bajo las condiciones indicadas de almacenamiento, manipulación y uso.

- CONTINÚA EN LA SIGUIENTE PÁGINA -

SECCIÓN 10: ESTABILIDAD Y REACTIVIDAD (continúa)

10.3 Posibilidad de reacciones peligrosas:

Bajo las condiciones indicadas no se esperan reacciones peligrosas que puedan producir una presión o temperaturas excesivas.

10.4 Condiciones que deben evitarse:

Aplicables para manipulación y almacenamiento a temperatura ambiente:

Choque y fricción	Contacto con el aire	Calentamiento	Luz Solar	Humedad
No aplicable	No aplicable	No aplicable	No aplicable	No aplicable

10.5 Materiales incompatibles:

Ácidos	Agua	Materias comburentes	Materias combustibles	Otros
Evitar ácidos fuertes	No aplicable	No aplicable	No aplicable	Evitar álcalis o bases fuertes

10.6 Productos de descomposición peligrosos:

Ver epígrafe 10.3, 10.4 y 10.5 para conocer los productos de descomposición específicamente. En dependencia de las condiciones de descomposición, como consecuencia de la misma pueden liberarse mezclas complejas de sustancias químicas: dióxido de carbono (CO_2), monóxido de carbono y otros compuestos orgánicos.

SECCIÓN 11: INFORMACIÓN TOXICOLÓGICA

11.1 Información sobre las clases de peligro definidas en el Reglamento (CE) n.o 1272/2008:

Efectos peligrosos para la salud:

En caso de exposición repetitiva, prolongada o a concentraciones superiores a las establecidas por los límites de exposición profesionales, pueden producirse efectos adversos para la salud en función de la vía de exposición:

A- Ingestión (efecto agudo):

- Toxicidad aguda: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por ingestión. Para más información ver sección 3.
- Corrosividad/Irritabilidad: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.

B- Inhalación (efecto agudo):

- Toxicidad aguda: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por inhalación. Para más información ver sección 3.
- Corrosividad/Irritabilidad: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.

C- Contacto con la piel y los ojos (efecto agudo):

- Contacto con la piel: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por contacto con la piel. Para más información ver sección 3.
- Contacto con los ojos: Produce lesiones oculares tras contacto.

D- Efectos CMR (carcinogenicidad, mutagenicidad y toxicidad para la reproducción):

- Carcinogenicidad: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por los efectos descritos. Para más información ver sección 3.
  IARC: No relevante
- Mutagenicidad: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.
- Toxicidad para la reproducción: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.

E- Efectos de sensibilización:

- Respiratoria: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas con efectos sensibilizantes por encima de los límites recogidos en el punto 3.2 del Reglamento (CE) 2020/878. Para más información ver secciones 2, 3 y 15.
- Cutánea: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.

F- Toxicidad específica en determinados órganos (STOT)-exposición única:

A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.

G- Toxicidad específica en determinados órganos (STOT)-exposición repetida:

- CONTINÚA EN LA SIGUIENTE PÁGINA -

SECCIÓN 11: INFORMACIÓN TOXICOLÓGICA (continúa)

- Toxicidad específica en determinados órganos (STOT)-exposición repetida: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.
- Piel: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.

H- Peligro por aspiración:

A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.

Información adicional:

No relevante

Información toxicológica específica del producto:

Toxicidad aguda		Género
DL50 oral	10700 mg/kg	Rata

Información toxicológica específica de las sustancias:

Identificación	Toxicidad aguda		Género
Acido DL-malico	DL50 oral	10700 mg/kg	Rata
CAS: 617-48-1	DL50 cutánea	>2000 mg/kg	
CE: 210-514-9	CL50 inhalación	>5 mg/L	

11.2 Información sobre otros peligros:

Propiedades de alteración endocrina

El producto no cumple los criterios por sus propiedades de alteración endocrina.

Otros datos

No relevante

SECCIÓN 12: INFORMACIÓN ECOLÓGICA

12.1 Toxicidad:

No determinado

12.2 Persistencia y degradabilidad:

No disponible

12.3 Potencial de bioacumulación:

No determinado

12.4 Movilidad en el suelo:

No determinado

12.5 Resultados de la valoración PBT y mPmB:

El producto no cumple los criterios PBT/vPvB

12.6 Propiedades de alteración endocrina:

El producto no cumple los criterios por sus propiedades de alteración endocrina.

12.7 Otros efectos adversos:

No descritos

SECCIÓN 13: CONSIDERACIONES RELATIVAS A LA ELIMINACIÓN

13.1 Métodos para el tratamiento de residuos:

Código	Descripción	Tipo de residuo (Reglamento (UE) nº 1357/2014)
20 01 14*	Ácidos	Peligroso

Tipo de residuo (Reglamento (UE) nº 1357/2014):

- CONTINÚA EN LA SIGUIENTE PÁGINA -

SECCIÓN 13: CONSIDERACIONES RELATIVAS A LA ELIMINACIÓN (continúa)

HP4 Irritante — irritación cutánea y lesiones oculares

Gestión del residuo (eliminación y valorización):

Consultar al gestor de residuos autorizado las operaciones de valorización y eliminación conforme al Anexo 1 y Anexo 2 (Directiva 2008/98/CE, Ley 7/2022). De acuerdo a los códigos 15 01 (2014/955/UE) en el caso de que el envase haya estado en contacto directo con el producto se gestionará del mismo modo que el propio producto, en caso contrario se gestionará como residuo no peligroso. Se desaconseja su vertido a cursos de agua. Ver epígrafe 6.2.

Disposiciones legislativas relacionadas con la gestión de residuos:

De acuerdo al Anexo II del Reglamento (CE) nº1907/2006 (REACH) se recogen las disposiciones comunitarias o estatales relacionadas con la gestión de residuos.

Legislación comunitaria: Directiva 2008/98/CE, 2014/955/UE, Reglamento (UE) nº 1357/2014.
Legislación nacional: Ley 7/2022, de 8 de abril, de residuos y suelos contaminados para una economía circular.

SECCIÓN 14: INFORMACIÓN RELATIVA AL TRANSPORTE

Este producto no está regulado para su transporte (ADR/RID,IMDG,IATA)

SECCIÓN 15: INFORMACIÓN REGLAMENTARIA

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

Sustancias candidatas a autorización en el Reglamento (CE) 1907/2006 (REACH): No relevante

Sustancias incluidas en el Anexo XIV de REACH (lista de autorización) y fecha de expiración: No relevante

Reglamento (CE) 1005/2009, sobre sustancias que agotan la capa de ozono: No relevante

Sustancias activas las cuales han sido incluidas en el Artículo 95 del Reglamento (UE) Nº 528/2012: No relevante

REGLAMENTO (UE) No 649/2012, relativo a la exportación e importación de productos químicos peligrosos: No relevante

Seveso III:

No relevante

Restricciones a la comercialización y al uso de ciertas sustancias y mezclas peligrosas (Anexo XVII del Reglamento REACH, etc ...):

No relevante

Disposiciones particulares en materia de protección de las personas o el medio ambiente:

Se recomienda emplear la información recopilada en esta ficha de datos de seguridad como datos de entrada en una evaluación de riesgos de las circunstancias locales con el objeto de establecer las medidas necesarias de prevención de riesgos para el manejo, utilización, almacenamiento y eliminación de este producto.

Otras legislaciones:

Reglamento (CE) n o 1272/2008 del Parlamento Europeo y del Consejo, de 16 de diciembre de 2008 , sobre clasificación, etiquetado y envasado de sustancias y mezclas, y por el que se modifican y derogan las Directivas 67/548/CEE y 1999/45/CE y se modifica el Reglamento (CE) n o 1907/2006 y todas sus modificaciones posteriores.

HACCP: Hazard analysis and critical control points, ISO: 22000

15.2 Evaluación de la seguridad química:

El proveedor no ha llevado a cabo evaluación de seguridad química.

SECCIÓN 16: OTRA INFORMACIÓN

Legislación aplicable a fichas de datos de seguridad:

Esta ficha de datos de seguridad se ha desarrollado de acuerdo al ANEXO II-Guía para la elaboración de Fichas de Datos de Seguridad del Reglamento (CE) Nº 1907/2006 (REGLAMENTO (UE) 2020/878 DE LA COMISIÓN)

Modificaciones respecto a la ficha de seguridad anterior que afectan a las medidas de gestión del riesgo:

REGLAMENTO (UE) 2020/878 DE LA COMISIÓN

Textos de las frases legislativas contempladas en la sección 2:

H319: Provoca irritación ocular grave.

- CONTINÚA EN LA SIGUIENTE PÁGINA -

SECCIÓN 16: OTRA INFORMACIÓN (continúa)

Textos de las frases legislativas contempladas en la sección 3:

Las frases indicadas no se refieren al producto en sí, son sólo a título informativo y hacen referencia a los componentes individuales que aparecen en la sección 3

Reglamento nº1272/2008 (CLP):

Eye Irrit. 2: H319 - Provoca irritación ocular grave.

Consejos relativos a la formación:

Se recomienda formación mínima en materia de prevención de riesgos laborales al personal que va a manipular este producto, con la finalidad de facilitar la comprensión e interpretación de esta ficha de datos de seguridad, así como del etiquetado del producto.

Principales fuentes bibliográficas:

http://echa.europa.eu
http://eur-lex.europa.eu

Abreviaturas y acrónimos:

ADR: Acuerdo europeo relativo al transporte internacional de mercancías peligrosas por carretera
IMDG: Código Marítimo Internacional de Mercancías Peligrosas
IATA: Asociación Internacional de Transporte Aéreo
OACI: Organización de Aviación Civil Internacional
DQO: Demanda Química de Oxígeno
DBO5: Demanda Biológica de Oxígeno a los 5 días
BCF: Factor de Bioconcentración
DL50: Dosis Letal 50
CL50: Concentración Letal 50
EC50: Concentración Efectiva 50
Log POW: Logaritmo Coeficiente Partición OctanolAgua
Koc: Coeficiente de Partición del Carbono Orgánico
FDS: Ficha de Datos de Seguridad
UFI: identificador único de fórmula
IARC: Centro Internacional de Investigaciones sobre el Cáncer

- FIN DE LA FICHA DE SEGURIDAD -

Section 1: Title of exposure scenario	
Contributing scenario controlling environmental exposure	ERC2 Formulation of mixture in closed and open systems
Contributing scenario controlling worker exposure	PROC1 Use in closed process, no likelihood of exposure PROC2 Use in closed, continuous process with occasional controlled exposure PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b Receiving and charging of the substance PROC3 Mixing, dispersing, completion in closed batch process PROC5 Mixing, dispersing and completion in open multistage batch process PROC8a Transfer in non-dedicated facilities PROC8b Transfer at dedicated facilities PROC9 Filling small containers in dedicated lines PROC8a Maintenance and cleaning operations PROC15 Use as laboratory reagent
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC2 Formulation of mixture in closed and open systems	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.45 tonnes/day
Annual use at site	≤ 100 tonnes/year
Percentage of tonnage used at regional scale	100%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	

Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC1 Use in closed process, no likelihood of exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Use in closed systems. (minimal contact during routine operations)
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)

Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC8b Receiving and charging of the substance	
Product (article) characteristic	

Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (5) PROC3 Mixing, dispersing, completion in closed batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed batch process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield

Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (6) PROC5 Mixing, dispersing and completion in open multistage batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (7) PROC8a Transfer in non-dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)

Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (8) PROC8b Transfer at dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (9) PROC9 Filling small containers in dedicated lines	
Product (article) characteristic	

Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (10) PROC8a Maintenance and cleaning operations	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield

Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Section 3: Exposure estimation and reference to its source	
Contributing scenario controlling environmental exposure (1) ERC2 Formulation of mixture in closed and open systems	

Release route	**Release rate**	**Release estimation method**
Water	9 kg/day	ERC based
Air	11.25 kg/day	ERC based
Soil	0.045 kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.057 mg/L	0.572
Sea water	0.006 mg/L	0.572

Sewage treatment plant	0.57 mg/L	0.19
Man via Environment - Inhalation	0.002 mg/m³	<0.01
Man via Environment - Oral	0.278 mg/kg bw/day	0.046
Contributing scenario controlling worker exposure (1) PROC1 Use in closed process, no likelihood of exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.007 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.002 mg/cm^2	<0.01
Combined routes, Systemic effects, Long Term	-	<0.01
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.274 mg/kg bw/day	0.137
Dermal, Local effects, Long Term	0.04 mg/cm^2	0.04
Combined routes, Systemic effects, Long Term	-	0.139
Combined routes, Systemic effects, Acute	-	<0.01

Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (4) PROC8b Receiving and charging of the substance		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	<0.01

Contributing scenario controlling worker exposure (5) PROC3 Mixing, dispersing, completion in closed batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.069 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (6) PROC5 Mixing, dispersing and completion in open multistage batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (7) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (8) PROC8b Transfer at dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	<0.01

Contributing scenario controlling worker exposure (9) PROC9 Filling small containers in dedicated lines		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.362
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (10) PROC8a Maintenance and cleaning operations		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019

Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.068 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	<0.01
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 2: Use at industrial site - Substance incorporated into article

Section 1: Title of exposure scenario	
Contributing scenario controlling environmental exposure	ERC5 Uses for industrial manual electroplating surface treatment
Contributing scenario controlling worker exposure	PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC2 Use in closed, continuous process with occasional controlled exposure - Metal cleaner (degreaser, descaler, etch); Automatic process PROC10 Roller application or brushing - Metal cleaner (degreaser, descaler, etch); Manual process PROC7 Industrial spraying PROC13 Treatment of articles by dipping and pouring PROC15 Use as laboratory reagent
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC5 Uses for industrial manual electroplating surface treatment	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.45 tonnes/day

Annual use at site	≤ 100 tonnes/year
Percentage of tonnage used at regional scale	100%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)

Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure - Metal cleaner (degreaser, descaler, etch); Automatic process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	Yes. [Effectiveness - Inhalation: 90%]
Local exhaust ventilation (Dermal)	No. [Effectiveness - Dermal: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (3) PROC10 Roller application or brushing - Metal cleaner (degreaser, descaler, etch); Manual process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	No.
Local exhaust ventilation	Yes. [Effectiveness - Inhalation: 90%]
Local exhaust ventilation (Dermal)	No. [Effectiveness - Dermal: 0%]

Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (4) PROC7 Industrial spraying	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	No.
Local exhaust ventilation	Yes. [Effectiveness - Inhalation: 95%]
Local exhaust ventilation (Dermal)	Yes. [Effectiveness - Dermal: 95%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands and upper wrists (1500 cm^2)
Contributing scenario controlling worker exposure (5) PROC13 Treatment of articles by dipping and pouring	
Product (article) characteristic	
Dustiness of material	Low

Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	No.
Local exhaust ventilation	Yes. [Effectiveness - Inhalation: 90%]
Local exhaust ventilation (Dermal)	No. [Effectiveness - Dermal: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (6) PROC15 Use as laboratory reagent	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield

Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	One hand face only (240 cm^2)

Section 3: Exposure estimation and reference to its source

Contributing scenario controlling environmental exposure (1)
ERC5 Uses for industrial manual electroplating surface treatment

Release route	Release rate	Release estimation method
Water	9 kg/day	Release factor
Air	78.75 kg/day	Release factor
Soil	1 %	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.057 mg/L	0.572
Sea water	0.006 mg/L	0.572
Sewage treatment plant	0.57 mg/L	0.19
Man via Environment - Inhalation	0.013 mg/m^3	<0.01
Man via Environment - Oral	1.941 mg/kg bw/day	0.324

Contributing scenario controlling worker exposure (1)
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Method: TRA Worker v3

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.07 mg/m^3	0.013
Inhalation, Systemic effects, Acute	0.28 mg/m^3	<0.01
Inhalation, Local effects, Long Term	0.07 mg/m^3	<0.01
Inhalation, Local effects, Acute	0.28 mg/m^3	<0.01
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.356
Combined routes, Systemic effects, Acute	-	<0.01

Contributing scenario controlling worker exposure (2)
PROC2 Use in closed, continuous process with occasional controlled exposure - Metal cleaner (degreaser, descaler, etch); Automatic process

Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	7 X 10^{-4} mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.003 mg/m³	<0.01
Inhalation, Local effects, Long Term	7 X 10^{-4} mg/m³	<0.01
Inhalation, Local effects, Acute	0.003 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.069 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.01 mg/cm^2	<0.01
Combined routes, Systemic effects, Long Term	-	0.034
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (3) PROC10 Roller application or brushing - Metal cleaner (degreaser, descaler, etch); Manual process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.035 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.14 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.035 mg/m³	<0.01
Inhalation, Local effects, Acute	0.14 mg/m³	<0.01
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.692
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (4) PROC7 Industrial spraying		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**

Inhalation, Systemic effects, Long Term	0.035 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.14 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.035 mg/m³	<0.01
Inhalation, Local effects, Acute	0.14 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.107 mg/kg bw/day	0.054
Dermal, Local effects, Long Term	0.005 mg/cm^2	<0.01
Combined routes, Systemic effects, Long Term	-	0.06
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (5) PROC13 Treatment of articles by dipping and pouring		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.007 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.028 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.007 mg/m³	<0.01
Inhalation, Local effects, Acute	0.028 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.344
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (6) PROC15 Use as laboratory reagent		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.28 mg/m³	<0.01

Inhalation, Local effects, Long Term	0.07 mg/m³	<0.01
Inhalation, Local effects, Acute	0.28 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.017 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.005 mg/cm^2	<0.01
Combined routes, Systemic effects, Long Term	-	0.022
Combined routes, Systemic effects, Acute	-	<0.01
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 3: Formulation - SpERC: AISE 2.1b.V2 - (granular cleaning and maintenance products: medium scale)

Section 1: Title of exposure scenario	
Contributing scenario controlling environmental exposure	ERC2 Formulation - water treatment and washing and cleaning products
Contributing scenario controlling worker exposure	PROC8b Receiving and charging of the substance PROC3 Mixing, dispersing, completion in closed batch process PROC5 Mixing, dispersing and completion in open multistage batch process PROC8a Transfer in non-dedicated facilities PROC8b Transfer at dedicated facilities PROC9 Filling small containers in dedicated lines PROC8a Maintenance and cleaning operations
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC2 Formulation - water treatment and washing and cleaning products	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 4.5 tonnes/day
Annual use at site	≤ 150 tonnes/year
Percentage of tonnage used at regional scale	100%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days

Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC8b Receiving and charging of the substance	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (2) PROC3 Mixing, dispersing, completion in closed batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	

Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (3) PROC5 Mixing, dispersing and completion in open multistage batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient

Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC8a Transfer in non-dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (5) PROC8b Transfer at dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced

Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (6) PROC9 Filling small containers in dedicated lines	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (7) PROC8a Maintenance and cleaning operations	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such

Amounts used, Frequency and duration of use		
Duration of activity	<8 hour(s)	
Technical conditions and measures to control dispersion from source towards the worker		
General ventilation	Good general ventilation (3-5 air changes per hour)	
Containment	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Advanced	
Conditions and measures related to personal protection, hygiene and health evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC2 Formulation - water treatment and washing and cleaning products		
Release route	**Release rate**	**Release estimation method**
Water	4.5 kg/day	SpERC based
Air	0 kg/day	SpERC based
Soil	0 %	SpERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.029 mg/L	0.287
Sea water	0.003 mg/L	0.287
Sewage treatment plant	0.285 mg/L	0.095
Man via Environment - Inhalation	3.014 X 10^{-11} mg/m³	<0.01
Man via Environment - Oral	1.328 X 10^{-4} mg/kg bw/day	<0.01
Contributing scenario controlling worker exposure (1) PROC8b Receiving and charging of the substance		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013

Inhalation, Systemic effects, Acute	0.28 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	<0.01
Inhalation, Local effects, Acute	0.28 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.356
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (2) PROC3 Mixing, dispersing, completion in closed batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.28 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	<0.01
Inhalation, Local effects, Acute	0.28 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.035 mg/kg bw/day	0.017
Dermal, Local effects, Long Term	0.01 mg/cm^2	0.01
Combined routes, Systemic effects, Long Term	-	0.03
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (3) PROC5 Mixing, dispersing and completion in open multistage batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.35 mg/m³	0.066
Inhalation, Systemic effects, Acute	1.4 mg/m³	0.013
Inhalation, Local effects, Long Term	0.35 mg/m³	0.011
Inhalation, Local effects, Acute	1.4 mg/m³	0.013
Dermal, Systemic effects,	0.685 mg/kg bw/day	0.343

Long Term		
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.408
Combined routes, Systemic effects, Acute	-	0.013
Contributing scenario controlling worker exposure (4) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.35 mg/m³	0.066
Inhalation, Systemic effects, Acute	1.4 mg/m³	0.013
Inhalation, Local effects, Long Term	0.35 mg/m³	0.011
Inhalation, Local effects, Acute	1.4 mg/m³	0.013
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.408
Combined routes, Systemic effects, Acute	-	0.013
Contributing scenario controlling worker exposure (5) PROC8b Transfer at dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.28 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	<0.01
Inhalation, Local effects, Acute	0.28 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.356
Combined routes, Systemic	-	<0.01

effects, Acute		
Contributing scenario controlling worker exposure (6) PROC9 Filling small containers in dedicated lines		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.28 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	<0.01
Inhalation, Local effects, Acute	0.28 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.343 mg/kg bw/day	0.172
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.185
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (7) PROC8a Maintenance and cleaning operations		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.35 mg/m³	0.066
Inhalation, Systemic effects, Acute	1.4 mg/m³	0.013
Inhalation, Local effects, Long Term	0.35 mg/m³	0.011
Inhalation, Local effects, Acute	1.4 mg/m³	0.013
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.408
Combined routes, Systemic effects, Acute	-	0.013
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 4: Formulation - SpERC: AISE 2.1b.V2 - (Liquid cleaning and maintenance products: low viscosity: medium scale)

Section 1: Title of exposure scenario	
Contributing scenario controlling environmental exposure	ERC2 Formulation
Contributing scenario controlling worker exposure	PROC8b Receiving and charging of the substance PROC3 Mixing, dispersing, completion in closed batch process PROC5 Mixing, dispersing and completion in open multistage batch process PROC8a Transfer in non-dedicated facilities PROC8b Transfer at dedicated facilities PROC9 Filling small containers in dedicated lines PROC8a Maintenance and cleaning operations
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC2 Formulation	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 4.5 tonnes/day
Annual use at site	≤ 150 tonnes/year
Percentage of tonnage used at regional scale	100%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC8b Receiving and charging of the substance	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	

Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (2) PROC3 Mixing, dispersing, completion in closed batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient

Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (3) PROC5 Mixing, dispersing and completion in open multistage batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC8a Transfer in non-dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced

Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (5) PROC8b Transfer at dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (6) PROC9 Filling small containers in dedicated lines	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such

Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (7) PROC8a Maintenance and cleaning operations	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use

Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC2 Formulation		
Release route	**Release rate**	**Release estimation method**
Water	4.5 kg/day	SpERC based
Air	0 kg/day	SpERC based
Soil	0 %	SpERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.029 mg/L	0.287
Sea water	0.003 mg/L	0.287
Sewage treatment plant	0.285 mg/L	0.095
Man via Environment - Inhalation	3.014 X 10^{-11} mg/m³	<0.01
Man via Environment - Oral	1.328 X 10^{-4} mg/kg bw/day	<0.01
Contributing scenario controlling worker exposure (1) PROC8b Receiving and charging of the substance		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.28 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	<0.01
Inhalation, Local effects, Acute	0.28 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.356
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (2) PROC3 Mixing, dispersing, completion in closed batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**

Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.28 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	<0.01
Inhalation, Local effects, Acute	0.28 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.035 mg/kg bw/day	0.017
Dermal, Local effects, Long Term	0.01 mg/cm^2	0.01
Combined routes, Systemic effects, Long Term	-	0.03
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (3) PROC5 Mixing, dispersing and completion in open multistage batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.35 mg/m³	0.066
Inhalation, Systemic effects, Acute	1.4 mg/m³	0.013
Inhalation, Local effects, Long Term	0.35 mg/m³	0.011
Inhalation, Local effects, Acute	1.4 mg/m³	0.013
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.408
Combined routes, Systemic effects, Acute	-	0.013
Contributing scenario controlling worker exposure (4) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.35 mg/m³	0.066
Inhalation, Systemic effects, Acute	1.4 mg/m³	0.013
Inhalation, Local effects, Long Term	0.35 mg/m³	0.011

Inhalation, Local effects, Acute	1.4 mg/m³	0.013
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.408
Combined routes, Systemic effects, Acute	-	0.013
Contributing scenario controlling worker exposure (5) PROC8b Transfer at dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.28 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	<0.01
Inhalation, Local effects, Acute	0.28 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.356
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (6) PROC9 Filling small containers in dedicated lines		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.28 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	<0.01
Inhalation, Local effects, Acute	0.28 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.343 mg/kg bw/day	0.172
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic	-	0.185

effects, Long Term		
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (7) PROC8a Maintenance and cleaning operations		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.35 mg/m³	0.066
Inhalation, Systemic effects, Acute	1.4 mg/m³	0.013
Inhalation, Local effects, Long Term	0.35 mg/m³	0.011
Inhalation, Local effects, Acute	1.4 mg/m³	0.013
Dermal, Systemic effects, Long Term	0.685 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.408
Combined routes, Systemic effects, Acute	-	0.013
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 5: Use at industrial site: Intermediate

Section 1: Title of exposure scenario	
Sectors of use [SU]	SU8 Manufacture of bulk, large scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals
Contributing scenario controlling environmental exposure	ERC6a Use at industrial site: Intermediate
Contributing scenario controlling worker exposure	PROC8a Transfer in non-dedicated facilities PROC8b Transfer at dedicated facilities PROC8b Receiving and charging of the substance PROC1 Use in closed process, no likelihood of exposure PROC2 Use in closed, continuous process with occasional controlled exposure PROC3 Use in closed batch process (synthesis or formulation) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises PROC15 Use as laboratory reagent
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC6a Use at industrial site: Intermediate	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.45 tonnes/day
Annual use at site	≤ 100 tonnes/year
Percentage of tonnage used at regional scale	100%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC8a Transfer in non-dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such

Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (2) PROC8b Transfer at dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use

Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (3) PROC8b Receiving and charging of the substance	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (4) PROC1 Use in closed process, no likelihood of exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Use in closed systems. (minimal contact during routine operations)
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]

Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (5) PROC2 Use in closed, continuous process with occasional controlled exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (6) PROC3 Use in closed batch process (synthesis or formulation)	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such

Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed batch process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (7) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use

Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands face (480 cm^2)	
Contributing scenario controlling worker exposure (8) PROC15 Use as laboratory reagent		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and duration of use		
Duration of activity	<8 hour(s)	
Technical conditions and measures to control dispersion from source towards the worker		
General ventilation	Basic general ventilation (1-3 air changes per hour)	
Containment	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Advanced	
Conditions and measures related to personal protection, hygiene and health evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	One hand face only (240 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC6a Use at industrial site: Intermediate		
Release route	**Release rate**	**Release estimation method**
Water	9 kg/day	ERC based
Air	22.5 kg/day	ERC based
Soil	0.45 kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.057 mg/L	0.572
Sea water	0.006 mg/L	0.572
Sewage treatment plant	0.57 mg/L	0.19
Man via Environment - Inhalation	0.004 mg/m^3	<0.01

Man via Environment - Oral	0.555 mg/kg bw/day	0.093
Contributing scenario controlling worker exposure (1) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (2) PROC8b Transfer at dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	<0.01

Contributing scenario controlling worker exposure (3) PROC8b Receiving and charging of the substance		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (4) PROC1 Use in closed process, no likelihood of exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.007 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.002 mg/cm^2	<0.01
Combined routes, Systemic effects, Long Term	-	<0.01
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (5) PROC2 Use in closed, continuous process with occasional controlled exposure		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.274 mg/kg bw/day	0.137
Dermal, Local effects, Long Term	0.04 mg/cm^2	0.04
Combined routes, Systemic effects, Long Term	-	0.139
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (6) PROC3 Use in closed batch process (synthesis or formulation)		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.138 mg/kg bw/day	0.069
Dermal, Local effects, Long Term	0.04 mg/cm^2	0.04
Combined routes, Systemic effects, Long Term	-	0.088
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (7) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019

Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (8) PROC15 Use as laboratory reagent		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.068 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	<0.01
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 6: Formulation of water treatment and washing and cleaning products

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC2 Adsorbents PC20 Products such as ph-regulators, flocculants, precipitants, neutralization agents PC35 Washing and cleaning products (including solvent based products) PC36 Water softeners PC37 Water treatment chemicals PC40 Extraction agents
Contributing scenario controlling environmental exposure	ERC2 Formulation of water treatment and washing and cleaning products
Contributing scenario controlling worker exposure	PROC1 Use in closed process, no likelihood of exposure PROC2 Use in closed, continuous process with occasional controlled exposure PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b Receiving and charging of the substance PROC3 Mixing, dispersing, completion in closed batch process PROC5 Mixing, dispersing and completion in open multistage batch process PROC8a Transfer in non-dedicated facilities PROC8b Transfer at dedicated facilities PROC9 Filling small containers in dedicated lines PROC8a Maintenance and cleaning operations PROC15 Use as laboratory reagent PROC21 Low energy manipulation of substances bound in materials and/or articles
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC2 Formulation of water treatment and washing and cleaning products	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.7 tonnes/day
Annual use at site	≤ 150 tonnes/year
Percentage of tonnage used at regional scale	100%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days

Contributing scenario controlling worker exposure (1) PROC1 Use in closed process, no likelihood of exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Use in closed systems. (minimal contact during routine operations)
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced

Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC8b Receiving and charging of the substance	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such

Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (5) PROC3 Mixing, dispersing, completion in closed batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed batch process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use

Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (6) PROC5 Mixing, dispersing and completion in open multistage batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (7) PROC8a Transfer in non-dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]

Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (8) PROC8b Transfer at dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (9) PROC9 Filling small containers in dedicated lines	
Product (article) characteristic	
Dustiness of material	Low

Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (10) PROC8a Maintenance and cleaning operations	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield

Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (12) PROC21 Low energy manipulation of substances bound in materials and/or articles	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)

Technical conditions and measures to control dispersion from source towards the worker		
General ventilation	Basic general ventilation (1-3 air changes per hour)	
Containment	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Advanced	
Conditions and measures related to personal protection, hygiene and health evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands and forearms (1980 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC2 Formulation of water treatment and washing and cleaning products		
Release route	**Release rate**	**Release estimation method**
Water	14 kg/day	ERC based
Air	17.5 kg/day	ERC based
Soil	0.07 kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.089 mg/L	0.889
Sea water	0.009 mg/L	0.889
Sewage treatment plant	0.886 mg/L	0.295
Man via Environment - Inhalation	0.003 mg/m^3	<0.01
Man via Environment - Oral	0.417 mg/kg bw/day	0.07
Contributing scenario controlling worker exposure (1) PROC1 Use in closed process, no likelihood of exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m^3	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m^3	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m^3	<0.01

Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.007 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.002 mg/cm^2	<0.01
Combined routes, Systemic effects, Long Term	-	<0.01
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.274 mg/kg bw/day	0.137
Dermal, Local effects, Long Term	0.04 mg/cm^2	0.04
Combined routes, Systemic effects, Long Term	-	0.139
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2

Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (4) PROC8b Receiving and charging of the substance		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (5) PROC3 Mixing, dispersing, completion in closed batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.069 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	<0.01

Contributing scenario controlling worker exposure (6) PROC5 Mixing, dispersing and completion in open multistage batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (7) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019

Contributing scenario controlling worker exposure (8) PROC8b Transfer at dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (9) PROC9 Filling small containers in dedicated lines		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.362
Combined routes, Systemic effects, Acute	-	<0.01

Contributing scenario controlling worker exposure (10) PROC8a Maintenance and cleaning operations		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.068 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	<0.01

Contributing scenario controlling worker exposure (12) PROC21 Low energy manipulation of substances bound in materials and/or articles		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.188
Inhalation, Systemic effects, Acute	4 mg/m³	0.038
Inhalation, Local effects, Long Term	1 mg/m³	0.031
Inhalation, Local effects, Acute	4 mg/m³	0.038
Dermal, Systemic effects, Long Term	0.283 mg/kg bw/day	0.142
Dermal, Local effects, Long Term	0.01 mg/cm^2	0.01
Combined routes, Systemic effects, Long Term	-	0.329
Combined routes, Systemic effects, Acute	-	0.038
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 7: Use at industrial sites of water treatment washing and cleaning products

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC2 Adsorbents PC20 Products such as ph-regulators, flocculants, precipitants, neutralization agents PC35 Washing and cleaning products (including solvent based products) PC36 Water softeners PC37 Water treatment chemicals PC40 Extraction agents
Sectors of use [SU]	SU10 Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
Contributing scenario controlling environmental exposure	ERC7 Use at industrial site
Contributing scenario controlling worker exposure	PROC2 Use/production of water treatment chemicals or washing and cleaning products in closed system with occasional controlled exposure PROC8b Raw material receipt and transfer PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 Preparation of water treatment chemicals or washing and cleaning products product

	PROC14 Preparation production (general) PROC21 Low energy manipulation of substances bound in materials and/or articles PROC8a Batch loading of equipment (manual, non dedicated) PROC8a Manual cleaning and maintenance of equipment
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC7 Use at industrial site	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.3 tonnes/day
Annual use at site	≤ 75 tonnes/year
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC2 Use/production of water treatment chemicals or washing and cleaning products in closed system with occasional controlled exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced

Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (2) PROC8b Raw material receipt and transfer	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in	>25%

mixture	
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC5 Preparation of water treatment chemicals or washing and cleaning products product	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]

Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (5) PROC14 Preparation production (general)	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (6) PROC21 Low energy manipulation of substances bound in materials and/or articles	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	

Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands and forearms (1980 cm^2)
Contributing scenario controlling worker exposure (7) PROC8a Batch loading of equipment (manual, non dedicated)	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use

Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (7) PROC8a Batch loading of equipment (manual, non dedicated)	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (8) PROC8a Manual cleaning and maintenance of equipment	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	5-25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)

Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Section 3: Exposure estimation and reference to its source	
Contributing scenario controlling environmental exposure (1) ERC7 Use at industrial site	

Release route	**Release rate**	**Release estimation method**
Water	6 kg/day	Release factor
Air	0.3 kg/day	Release factor
Soil	15 kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.038 mg/L	0.382
Sea water	0.004 mg/L	0.382
Sewage treatment plant	0.38 mg/L	0.127
Man via Environment - Inhalation	5.712 X 10^{-5} mg/m³	<0.01
Man via Environment - Oral	0.009 mg/kg bw/day	<0.01

Contributing scenario controlling worker exposure (1)
PROC2 Use/production of water treatment chemicals or washing and cleaning products in closed system with occasional controlled exposure

Method: TRA Worker v3

Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m³	<0.01

Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (2) PROC8b Raw material receipt and transfer		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.437

Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (4) PROC5 Preparation of water treatment chemicals or washing and cleaning products product		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (5) PROC14 Preparation production (general)		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	<0.01
Inhalation, Local effects, Acute	0.4 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.343 mg/kg bw/day	0.172
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.19
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (6) PROC21 Low energy manipulation of substances bound in materials and/or articles		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	1 mg/m³	0.188
Inhalation, Systemic effects, Acute	4 mg/m³	0.038
Inhalation, Local effects, Long Term	1 mg/m³	0.031
Inhalation, Local effects, Acute	4 mg/m³	0.038
Dermal, Systemic effects, Long Term	0.283 mg/kg bw/day	0.142
Dermal, Local effects, Long Term	0.01 mg/cm^2	0.01
Combined routes, Systemic effects, Long Term	-	0.329
Combined routes, Systemic effects, Acute	-	0.038
Contributing scenario controlling worker exposure (7) PROC8a Batch loading of equipment (manual, non dedicated)		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.35 mg/m³	0.066
Inhalation, Systemic effects, Acute	1.4 mg/m³	0.013
Inhalation, Local effects, Long Term	0.35 mg/m³	0.011
Inhalation, Local effects, Acute	1.4 mg/m³	0.013
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.751
Combined routes, Systemic effects, Acute	-	0.013
Contributing scenario controlling worker exposure (8) PROC8a Manual cleaning and maintenance of equipment		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.3 mg/m³	0.056
Inhalation, Systemic effects, Acute	1.2 mg/m³	0.012

Inhalation, Local effects, Long Term	0.3 mg/m³	<0.01
Inhalation, Local effects, Acute	1.2 mg/m³	0.012
Dermal, Systemic effects, Long Term	0.823 mg/kg bw/day	0.411
Dermal, Local effects, Long Term	0.06 mg/cm^2	0.06
Combined routes, Systemic effects, Long Term	-	0.468
Combined routes, Systemic effects, Acute	-	0.012
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 8: Professional use in water treatment and cleaning products

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC2 Adsorbents PC20 Products such as ph-regulators, flocculants, precipitants, neutralization agents PC35 Washing and cleaning products (including solvent based products) PC36 Water softeners PC37 Water treatment chemicals PC40 Extraction agents
Contributing scenario controlling environmental exposure	ERC8a Professional use in water treatment and cleaning products
Contributing scenario controlling worker exposure	PROC8b Raw material receipt and transfer PROC5 Batch or other process with opportunity for exposure PROC21 Low energy manipulation of substances bound in materials and/or articles PROC8a Transfer in non-dedicated facilities
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC8a Professional use in water treatment and cleaning products	
Amounts used, Frequency and duration of use	
Daily wide dispersive use	≤ 5.5 X 10^{-6} tonnes/day
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days

Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC8b Raw material receipt and transfer	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Basic
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (2) PROC5 Batch or other process with opportunity for exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%

Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Basic
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (3) PROC21 Low energy manipulation of substances bound in materials and/or articles	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Basic
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield

Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands and forearms (1980 cm^2)	
Contributing scenario controlling worker exposure (4) PROC8a Transfer in non-dedicated facilities		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and duration of use		
Duration of activity	<8 hour(s)	
Technical conditions and measures to control dispersion from source towards the worker		
General ventilation	Basic general ventilation (1-3 air changes per hour)	
Containment	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Basic	
Conditions and measures related to personal protection, hygiene and health evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC8a Professional use in water treatment and cleaning products		
Release route	**Release rate**	**Release estimation method**
Water	0.006 kg/day	ERC based
Air	0.006 kg/day	ERC based
Soil	0 kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	2.988 X 10^{-4} mg/L	<0.01

Sea water	2.869 X 10^{-5} mg/L	<0.01
Sewage treatment plant	3.481 X 10^{-4} mg/L	<0.01
Man via Environment - Inhalation	2.912 X 10^{-11} mg/m³	<0.01
Man via Environment - Oral	7.299 X 10^{-5} mg/kg bw/day	<0.01
Contributing scenario controlling worker exposure (1) PROC8b Raw material receipt and transfer		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (2) PROC5 Batch or other process with opportunity for exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.188
Inhalation, Systemic effects, Acute	4 mg/m³	0.038
Inhalation, Local effects, Long Term	1 mg/m³	0.031
Inhalation, Local effects, Acute	4 mg/m³	0.038
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.873
Combined routes, Systemic effects, Acute	-	0.038

Contributing scenario controlling worker exposure (3) PROC21 Low energy manipulation of substances bound in materials and/or articles		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	3 mg/m³	0.563
Inhalation, Systemic effects, Acute	12 mg/m³	0.115
Inhalation, Local effects, Long Term	3 mg/m³	0.094
Inhalation, Local effects, Acute	12 mg/m³	0.115
Dermal, Systemic effects, Long Term	0.283 mg/kg bw/day	0.142
Dermal, Local effects, Long Term	0.01 mg/cm^2	0.01
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	0.115
Contributing scenario controlling worker exposure (4) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 9: Consumer water treatment and cleaning product use

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC2 Adsorbents PC20 Products such as ph-regulators, flocculants, precipitants, neutralization agents PC35 Washing and cleaning products (including solvent based products) PC36 Water softeners PC37 Water treatment chemicals PC40 Extraction agents
Contributing scenario controlling environmental exposure	ERC8a Consumer water treatment and cleaning product use
Contributing scenario controlling consumer exposure	PC36 Water softeners PC35 Washing and cleaning products PC37 Water treatment chemicals PC2 Adsorbents
Subsequent service life exposure scenario(s)	ES 25 Service life (professional worker); Service life articles used by workers; SU 5; SU 6b; SU 11; SU 12; SU 13; SU 16; SU 17; SU 18; SU 19; SU 0
	ES 26 Service life (consumers); Service life articles used by consumers
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC8a Consumer water treatment and cleaning product use	
Amounts used, Frequency and duration of use	
Daily wide dispersive use	≤ 3.575 X 10^{-5} tonnes/day
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^{3} m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^{4} m^3/days
Contributing scenario controlling consumer exposure (1) PC36 Water softeners	
Product (article) characteristic	
Product/ Article subcategory	No value
Contributing scenario controlling consumer exposure (2)	

PC35 Washing and cleaning products		
Product (article) characteristic		
Product/ Article subcategory	Cleaners, liquids (all purposes cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	
Concentration of substance in mixture	0.8 g/g “Concentration of the substance in the product has been set to up to 100% (substance as such) for assessment purposes”	
Oral contact foreseen	No.	
Amounts used, Frequency and duration of use		
Amount of product used per application	500 g/event	
Exposure time	0.33 hour(s)	
Frequency of use	1 event/day	
Other conditions affecting consumers exposure		
Body parts potentially exposed	Fingertips	
Dermal transfer factor	1	
Contributing scenario controlling consumer exposure (3) PC37 Water treatment chemicals		
Product (article) characteristic		
Product/ Article subcategory	No value	
Contributing scenario controlling consumer exposure (4) PC2 Adsorbents		
Product (article) characteristic		
Product/ Article subcategory	No value	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC8a Consumer water treatment and cleaning product use		
Release route	**Release rate**	**Release estimation method**
Water	0.036 kg/day	ERC based
Air	0.036 kg/day	ERC based
Soil	0 kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	4.86×10^{-4} mg/L	<0.01
Sea water	4.746×10^{-5} mg/L	<0.01
Sewage treatment plant	0.002 mg/L	<0.01
Man via Environment - Inhalation	3.011×10^{-11} mg/m³	<0.01
Man via Environment - Oral	7.624×10^{-5} mg/kg bw/day	<0.01

Contributing scenario controlling consumer exposure (1) PC36 Water softeners		
Not available		
Contributing scenario controlling consumer exposure (2) PC35 Washing and cleaning products		
Method: TRA Consumer v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.022 mg/m³	0.014
Inhalation, Local effects, Long Term	0.022 mg/m³	0.014
Dermal, Systemic effects, Long Term	4.76 mg/kg bw/day	0.793
Oral, Systemic effects, Long Term	0 mg/kg bw/day	< 0.01
Combined routes, Systemic effects, Long Term	-	0.807
Contributing scenario controlling consumer exposure (3) PC37 Water treatment chemicals		
Not available		
Contributing scenario controlling consumer exposure (4) PC2 Adsorbents		
Not available		
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 10: Formulation - SpERC: Cosmetics Europe / AISE 2.3b.V2 - (medium scale)

Section 1: Title of exposure scenario

Chemical product category [PC]	PC29 Pharmaceuticals PC39 Cosmetics, personal care products
Contributing scenario controlling environmental exposure	ERC2 Formulation of preparations
Contributing scenario controlling worker exposure	PROC1 Use in closed process, no likelihood of exposure PROC2 Use in closed, continuous process with occasional controlled exposure PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b Receiving and charging of the substance PROC3 Mixing, dispersing, completion in closed batch process PROC5 Mixing, dispersing and completion in open multistage batch process PROC8a Transfer in non-dedicated facilities PROC8b Transfer at dedicated facilities PROC9 Filling small containers in dedicated lines PROC8a Maintenance and cleaning operations PROC15 Use as laboratory reagent
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC2 Formulation of preparations	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.5 tonnes/day
Annual use at site	≤ 150 tonnes/year
Percentage of tonnage used at regional scale	100%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC1 Use in closed process, no likelihood of exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such

Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Use in closed systems. (minimal contact during routine operations)
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use

Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC8b Receiving and charging of the substance	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety	Advanced

Management System	
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (5) PROC3 Mixing, dispersing, completion in closed batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed batch process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (6) PROC5 Mixing, dispersing and completion in open multistage batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such

Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (7) PROC8a Transfer in non-dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use

Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (8) PROC8b Transfer at dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (9) PROC9 Filling small containers in dedicated lines	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]

Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (10) PROC8a Maintenance and cleaning operations	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent	
Product (article) characteristic	
Dustiness of material	Low

Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and duration of use		
Duration of activity	<8 hour(s)	
Technical conditions and measures to control dispersion from source towards the worker		
General ventilation	Basic general ventilation (1-3 air changes per hour)	
Containment	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Advanced	
Conditions and measures related to personal protection, hygiene and health evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	One hand face only (240 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC2 Formulation of preparations		
Release route	**Release rate**	**Release estimation method**
Water	0.5 kg/day	SpERC based
Air	0 kg/day	SpERC based
Soil	0 kg/day	SpERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.003 mg/L	0.034
Sea water	3.416 X 10^{-4} mg/L	0.034
Sewage treatment plant	0.032 mg/L	0.011
Man via Environment - Inhalation	2.914 X 10^{-11} mg/m^3	< 0.01
Man via Environment - Oral	1.049 X 10^{-4} mg/kg bw/day	< 0.01
Contributing scenario controlling worker exposure (1) PROC1 Use in closed process, no likelihood of exposure		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.007 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.002 mg/cm^2	<0.01
Combined routes, Systemic effects, Long Term	-	<0.01
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.274 mg/kg bw/day	0.137
Dermal, Local effects, Long Term	0.04 mg/cm^2	0.04
Combined routes, Systemic effects, Long Term	-	0.139
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (4) PROC8b Receiving and charging of the substance		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (5) PROC3 Mixing, dispersing, completion in closed batch process		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.069 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (6) PROC5 Mixing, dispersing and completion in open multistage batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (7) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (8) PROC8b Transfer at dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.28 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.28 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.356
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (9) PROC9 Filling small containers in dedicated lines		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.362
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (10) PROC8a Maintenance and cleaning operations		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.068 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 11: Formulation - SpERC: Cosmetics Europe / AISE 2.1b.V2 - (medium scale)

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC29 Pharmaceuticals PC39 Cosmetics, personal care products
Contributing scenario controlling environmental exposure	ERC2 Formulation of preparations
Contributing scenario controlling worker exposure	PROC1 Use in closed process, no likelihood of exposure PROC2 Use in closed, continuous process with occasional controlled exposure PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b Receiving and charging of the substance PROC3 Mixing, dispersing, completion in closed batch process PROC5 Mixing, dispersing and completion in open multistage batch process PROC8a Transfer in non-dedicated facilities PROC8b Transfer at dedicated facilities PROC9 Filling small containers in dedicated lines PROC8a Maintenance and cleaning operations PROC15 Use as laboratory reagent
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC2 Formulation of preparations	

Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.2 tonnes/day
Annual use at site	≤ 50 tonnes/year
Percentage of tonnage used at regional scale	100%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC1 Use in closed process, no likelihood of exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Use in closed systems. (minimal contact during routine operations)
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use

Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]

Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC8b Receiving and charging of the substance	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (5) PROC3 Mixing, dispersing, completion in closed batch process	
Product (article) characteristic	
Dustiness of material	Low

Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed batch process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (6) PROC5 Mixing, dispersing and completion in open multistage batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield

Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (7) PROC8a Transfer in non-dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (8) PROC8b Transfer at dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)

Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (9) PROC9 Filling small containers in dedicated lines	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)

Contributing scenario controlling worker exposure (10) PROC8a Maintenance and cleaning operations	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced

Conditions and measures related to personal protection, hygiene and health evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	One hand face only (240 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC2 Formulation of preparations		
Release route	**Release rate**	**Release estimation method**
Water	0.4 kg/day	SpERC based
Air	0 kg/day	SpERC based
Soil	0 kg/day	SpERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.003 mg/L	0.028
Sea water	2.783 X 10^{-4} mg/L	0.028
Sewage treatment plant	0.025 mg/L	< 0.01
Man via Environment - Inhalation	2.913 X 10^{-11} mg/m^3	< 0.01
Man via Environment - Oral	8.144 X 10^{-5} mg/kg bw/day	< 0.01
Contributing scenario controlling worker exposure (1) PROC1 Use in closed process, no likelihood of exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m^3	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m^3	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m^3	<0.01
Inhalation, Local effects, Acute	0.04 mg/m^3	<0.01
Dermal, Systemic effects, Long Term	0.007 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.002 mg/cm^2	<0.01
Combined routes, Systemic effects, Long Term	-	<0.01

Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.274 mg/kg bw/day	0.137
Dermal, Local effects, Long Term	0.04 mg/cm^2	0.04
Combined routes, Systemic effects, Long Term	-	0.139
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019

Contributing scenario controlling worker exposure (4) PROC8b Receiving and charging of the substance		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (5) PROC3 Mixing, dispersing, completion in closed batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.069 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01

Contributing scenario controlling worker exposure (6) PROC5 Mixing, dispersing and completion in open multistage batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (7) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019

Contributing scenario controlling worker exposure (8) PROC8b Transfer at dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.28 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.28 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.356
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (9) PROC9 Filling small containers in dedicated lines		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.362
Combined routes, Systemic effects, Acute	-	< 0.01

Contributing scenario controlling worker exposure (10) PROC8a Maintenance and cleaning operations		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.068 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 12: Consumer cosmetics, pharmaceuticals and personal care products

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC29 Pharmaceuticals PC39 Cosmetics, personal care products
Contributing scenario controlling environmental exposure	ERC8e, ERC8b Consumer use
Contributing scenario controlling consumer exposure	PC39 Cosmetics, personal care products PC29 Pharmaceuticals
Subsequent service life exposure scenario(s)	ES 26 Service life (consumers); Service life articles used by consumers
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC8e Consumer use	
Amounts used, Frequency and duration of use	
Daily wide dispersive use	≤ 8.25 X 10^{-5} tonnes/day
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^{3} m^{3}/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^{4} m^{3}/days
Contributing scenario controlling consumer exposure (1) PC39 Cosmetics, personal care products	
Product (article) characteristic	
Product/ Article subcategory	No value
Contributing scenario controlling consumer exposure (2) PC29 Pharmaceuticals	
Product (article) characteristic	
Product/ Article subcategory	No value
Section 3: Exposure estimation and reference to its source	
Contributing scenario controlling environmental exposure (1) ERC8e Consumer use	

Release route	Release rate	Release estimation method
Water	0.002 kg/day	ERC based
Air	8.25 X 10^{-5} kg/day	ERC based
Soil	8.25 X 10^{-4} kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	2.744 X 10^{-4} mg/L	<0.01
Sea water	2.625 X 10^{-5} mg/L	<0.01
Sewage treatment plant	1.044 X 10^{-4} mg/L	<0.01
Man via Environment - Inhalation	2.912 X 10^{-11} mg/m³	<0.01
Man via Environment - Oral	7.289 X 10^{-5} mg/kg bw/day	<0.01
Contributing scenario controlling consumer exposure (1) PC39 Cosmetics, personal care products		
Not available		
Contributing scenario controlling consumer exposure (2) PC29 Pharmaceuticals		
Not available		
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 13: Formulation - dyestuffs and textiles use

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC23 Leather tanning, dye, finishing, impregnation and care products PC26 Paper and board dye, finishing and impregnation products: including bleaches and other processing aids PC34 Textile dyes, finishing and impregnating products; including bleaches and other processing aids
Contributing scenario controlling environmental exposure	ERC2 Formulation of preparations
Contributing scenario controlling worker exposure	PROC1 Use in closed process, no likelihood of exposure PROC2 Use in closed, continuous process with occasional controlled exposure PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b Receiving and charging of the substance PROC3 Mixing, dispersing, completion in closed batch process PROC5 Mixing, dispersing and completion in open multistage batch process PROC8a Transfer in non-dedicated facilities PROC8b Transfer at dedicated facilities PROC9 Filling small containers in dedicated lines PROC8a Maintenance and cleaning operations PROC15 Use as laboratory reagent

Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC2 Formulation of preparations	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.7 tonnes/day
Annual use at site	≤ 150 tonnes/year
Percentage of tonnage used at regional scale	100%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC1 Use in closed process, no likelihood of exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Use in closed systems. (minimal contact during routine operations)
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield

Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure

Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC8b Receiving and charging of the substance	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (5) PROC3 Mixing, dispersing, completion in closed batch process	
Product (article) characteristic	
Dustiness of material	Low

Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed batch process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (6) PROC5 Mixing, dispersing and completion in open multistage batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield

Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (7) PROC8a Transfer in non-dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (8) PROC8b Transfer at dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)

Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (9) PROC9 Filling small containers in dedicated lines	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (10) PROC8a Maintenance and cleaning operations	

Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]

Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	One hand face only (240 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC2 Formulation of preparations		
Release route	**Release rate**	**Release estimation method**
Water	14 kg/day	ERC based
Air	17.5 kg/day	ERC based
Soil	0.07 kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.089 mg/L	0.889
Sea water	0.009 mg/L	0.889
Sewage treatment plant	0.886 mg/L	0.295
Man via Environment - Inhalation	0.003 mg/m^3	< 0.01
Man via Environment - Oral	0.417 mg/kg bw/day	0.07
Contributing scenario controlling worker exposure (1) PROC1 Use in closed process, no likelihood of exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m^3	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m^3	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m^3	<0.01
Inhalation, Local effects, Acute	0.04 mg/m^3	<0.01
Dermal, Systemic effects, Long Term	0.007 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.002 mg/cm^2	<0.01
Combined routes, Systemic effects, Long Term	-	<0.01
Combined routes, Systemic effects, Acute	-	<0.01

Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.274 mg/kg bw/day	0.137
Dermal, Local effects, Long Term	0.04 mg/cm^2	0.04
Combined routes, Systemic effects, Long Term	-	0.139
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (4) PROC8b Receiving and charging of the substance		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**

Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (5) PROC3 Mixing, dispersing, completion in closed batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.069 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (6) PROC5 Mixing, dispersing and completion in open multistage batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016

Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (7) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (8) PROC8b Transfer at dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic	-	0.704

effects, Long Term		
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (9) PROC9 Filling small containers in dedicated lines		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.362
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (10) PROC8a Maintenance and cleaning operations		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019

Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.068 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 14: Use at industrial sites of dyestuffs and in textiles uses

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC23 Leather tanning, dye, finishing, impregnation and care products PC26 Paper and board dye, finishing and impregnation products: including bleaches and other processing aids PC34 Textile dyes, finishing and impregnating products; including bleaches and other processing aids
Sectors of use [SU]	SU5 Manufacture of textiles, leather, fur SU6b Manufacture of pulp, paper and paper products
Contributing scenario controlling environmental exposure	ERC6b Use at industrial site
Contributing scenario controlling worker exposure	PROC2 Application of dyestuffs in closed system with occasional controlled exposure PROC8b Raw material receipt and transfer PROC5 Preparation of dyestuffs application PROC8a Batch loading of equipment (manual, non dedicated) PROC7 Spray coating- any technique PROC10 Brushing, roller, spreader, flow coating or printing- any technique PROC13 Treatment of articles by dipping and pouring PROC2 Curing and drying processes after application- elevated temperature PROC8a Manual cleaning and maintenance of equipment

Subsequent service life exposure scenario(s)	ES 25 Service life (professional worker); Service life articles used by workers; SU 5; SU 6b; SU 11; SU 12; SU 13; SU 16; SU 17; SU 18; SU 19; SU 0
	ES 26 Service life (consumers); Service life articles used by consumers
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC6b Use at industrial site	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.7 tonnes/day
Annual use at site	≤ 150 tonnes/year
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC2 Application of dyestuffs in closed system with occasional controlled exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced

Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (2) PROC8b Raw material receipt and transfer	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (3) PROC5 Preparation of dyestuffs application	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in	>25%

mixture	
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC8a Batch loading of equipment (manual, non dedicated)	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]

Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (5) PROC7 Spray coating- any technique	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	No.
Local exhaust ventilation	Yes [Effectiveness - Inhalation: 95%]
Local exhaust ventilation (Dermal)	Yes [Effectiveness - Dermal: 95%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands and upper wrists (1500 cm^2)
Contributing scenario controlling worker exposure (6) PROC10 Brushing, roller, spreader, flow coating or printing- any technique	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes

Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (7) PROC13 Treatment of articles by dipping and pouring	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	

Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (8) PROC2 Curing and drying processes after application- elevated temperature	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (9) PROC8a Manual cleaning and maintenance of equipment	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	

General ventilation	Basic general ventilation (1-3 air changes per hour)	
Containment	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Advanced	
Conditions and measures related to personal protection, hygiene and health evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC6b Use at industrial site		
Release route	**Release rate**	**Release estimation method**
Water	14 kg/day	Release factor
Air	0.7 kg/day	Release factor
Soil	0.175 kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.089 mg/L	0.889
Sea water	0.009 mg/L	0.889
Sewage treatment plant	0.886 mg/L	0.295
Man via Environment - Inhalation	1.142 X 10^{-4} mg/m³	< 0.01
Man via Environment - Oral	0.018 mg/kg bw/day	< 0.01
Contributing scenario controlling worker exposure (1) PROC2 Application of dyestuffs in closed system with occasional controlled exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.04 mg/m³	< 0.01

Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (2) PROC8b Raw material receipt and transfer		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (3) PROC5 Preparation of dyestuffs application		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.35 mg/m³	0.066
Inhalation, Systemic effects, Acute	1.4 mg/m³	0.013
Inhalation, Local effects, Long Term	0.35 mg/m³	0.011
Inhalation, Local effects, Acute	1.4 mg/m³	0.013
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.751

Combined routes, Systemic effects, Acute	-	0.013
Contributing scenario controlling worker exposure (4) PROC8a Batch loading of equipment (manual, non dedicated)		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (5) PROC7 Spray coating- any technique		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.035 mg/m³	< 0.01
Inhalation, Systemic effects, Acute	0.14 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.035 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.14 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.107 mg/kg bw/day	0.054
Dermal, Local effects, Long Term	0.005 mg/cm^2	< 0.01
Combined routes, Systemic effects, Long Term	-	0.06
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (6) PROC10 Brushing, roller, spreader, flow coating or printing- any technique		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (7) PROC13 Treatment of articles by dipping and pouring		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (8) PROC2 Curing and drying processes after application- elevated temperature		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	< 0.01

Inhalation, Local effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.04 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (9) PROC8a Manual cleaning and maintenance of equipment		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 15: Formulation - construction products

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC0 Other
Contributing scenario controlling environmental exposure	ERC2 Formulation of preparations
Contributing scenario controlling worker exposure	PROC1 Use in closed process, no likelihood of exposure PROC2 Use in closed, continuous process with occasional controlled exposure PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b Receiving and charging of the substance PROC3 Mixing, dispersing, completion in closed batch process PROC5 Mixing, dispersing and completion in open multistage batch process PROC8a Transfer in non-dedicated facilities PROC8b Transfer at dedicated facilities PROC9 Filling small containers in dedicated lines PROC8a Maintenance and cleaning operations PROC15 Use as laboratory reagent
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC2 Formulation of preparations	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.7 tonnes/day
Annual use at site	≤ 150 tonnes/year
Percentage of tonnage used at regional scale	100%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC1 Use in closed process, no likelihood of exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in	Substance as such

mixture	
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Use in closed systems. (minimal contact during routine operations)
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	

Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC8b Receiving and charging of the substance	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]

Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (5) PROC3 Mixing, dispersing, completion in closed batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed batch process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (6) PROC5 Mixing, dispersing and completion in open multistage batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in	Substance as such

mixture	
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (7) PROC8a Transfer in non-dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	

Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (8) PROC8b Transfer at dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (9) PROC9 Filling small containers in dedicated lines	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]

Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (10) PROC8a Maintenance and cleaning operations	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in	Substance as such

mixture		
Amounts used, Frequency and duration of use		
Duration of activity	<8 hour(s)	
Technical conditions and measures to control dispersion from source towards the worker		
General ventilation	Basic general ventilation (1-3 air changes per hour)	
Containment	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Advanced	
Conditions and measures related to personal protection, hygiene and health evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	One hand face only (240 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC2 Formulation of preparations		
Release route	**Release rate**	**Release estimation method**
Water	14 kg/day	ERC based
Air	17.5 kg/day	ERC based
Soil	0.07 kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.089 mg/L	0.889
Sea water	0.009 mg/L	0.889
Sewage treatment plant	0.886 mg/L	0.295
Man via Environment - Inhalation	0.003 mg/m³	< 0.01
Man via Environment - Oral	0.417 mg/kg bw/day	0.07
Contributing scenario controlling worker exposure (1) PROC1 Use in closed process, no likelihood of exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects,	0.01 mg/m³	<0.01

Long Term		
Inhalation, Systemic effects, Acute	0.04 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.007 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.002 mg/cm^2	<0.01
Combined routes, Systemic effects, Long Term	-	<0.01
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.274 mg/kg bw/day	0.137
Dermal, Local effects, Long Term	0.04 mg/cm^2	0.04
Combined routes, Systemic effects, Long Term	-	0.139
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019

Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (4) PROC8b Receiving and charging of the substance		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (5) PROC3 Mixing, dispersing, completion in closed batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.069 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053

Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (6) PROC5 Mixing, dispersing and completion in open multistage batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (7) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (8) PROC8b Transfer at dedicated facilities		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.28 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.28 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.356
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (9) PROC9 Filling small containers in dedicated lines		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.362
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (10) PROC8a Maintenance and cleaning operations		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.068 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 16: Use at industrial sites in construction products

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC0 Other
Sectors of use [SU]	SU19 Building and construction work
Contributing scenario controlling environmental exposure	ERC7 Use at industrial site
Contributing scenario controlling worker exposure	PROC8b Raw material receipt and transfer PROC3 Use in closed batch process (synthesis or formulation) PROC2 Use in closed, continuous process with occasional controlled exposure PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC6 Calendering operations PROC8a Transfer in non-dedicated facilities PROC8a Maintenance and cleaning operations
Subsequent service life exposure scenario(s)	ES 25 Service life (professional worker); Service life articles used by workers; SU 5; SU 6b; SU 11; SU 12; SU 13; SU 16; SU 17; SU 18; SU 19; SU 0
	ES 26 Service life (consumers); Service life articles used by consumers
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC7 Use at industrial site	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.7 tonnes/day
Annual use at site	≤ 150 tonnes/year
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC8b Raw material receipt and transfer	

Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (2) PROC3 Use in closed batch process (synthesis or formulation)	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed batch process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]

Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (3) PROC2 Use in closed, continuous process with occasional controlled exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed batch process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	

Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (5) PROC6 Calendering operations	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced

Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (6) PROC8a Transfer in non-dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (7) PROC8a Maintenance and cleaning operations	
Product (article) characteristic	
Dustiness of material	Low

Concentration of substance in mixture	>25%	
Solid in solid mixtures	Yes	
Amounts used, Frequency and duration of use		
Duration of activity	<8 hour(s)	
Technical conditions and measures to control dispersion from source towards the worker		
General ventilation	Basic general ventilation (1-3 air changes per hour)	
Containment	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Advanced	
Conditions and measures related to personal protection, hygiene and health evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC7 Use at industrial site		
Release route	**Release rate**	**Release estimation method**
Water	14 kg/day	Release factor
Air	0.7 kg/day	Release factor
Soil	35 kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.089 mg/L	0.889
Sea water	0.009 mg/L	0.889
Sewage treatment plant	0.886 mg/L	0.295
Man via Environment - Inhalation	1.142 X 10^{-4} mg/m^3	< 0.01
Man via Environment - Oral	0.018 mg/kg bw/day	< 0.01
Contributing scenario controlling worker exposure (1) PROC8b Raw material receipt and transfer		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.28 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.28 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.699
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (2) PROC3 Use in closed batch process (synthesis or formulation)		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.069 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (3) PROC2 Use in closed, continuous process with occasional controlled exposure		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.04 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (4) PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (5) PROC6 Calendering operations		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (6) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (7) PROC8a Maintenance and cleaning operations		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 17: Professional creation of building materials and articles

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC0 Other
Sectors of use [SU]	SU19 Building and construction work
Contributing scenario controlling environmental exposure	ERC 8f, ERC 8c Professional use of building materials and articles creation
Contributing scenario controlling worker exposure	PROC8a Transfer in non-dedicated facilities PROC5 Mixing operations PROC14 Article preparation PROC24 High energy processing PROC8a Maintenance and cleaning operations
Subsequent service life exposure scenario(s)	ES 25 Service life (professional worker); Service life articles used by workers; SU 5; SU 6b; SU 11; SU 12; SU 13; SU 16; SU 17; SU 18; SU 19; SU 0
	ES 26 Service life (consumers); Service life articles used by consumers
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC 8f Professional use of building materials and articles creation	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 8.25 X 10^{-5} tonnes/day
Percentage of tonnage used at regional scale	10%

Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC8a Transfer in non-dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (2) PROC5 Mixing operations	
Product (article) characteristic	

Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (3) PROC14 Article preparation	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Basic
Conditions and measures related to personal protection, hygiene and health evaluation	

Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC24 High energy processing	
Product (article) characteristic	
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Basic
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature > melting point
Skin surface potentially exposed	Two hands and forearms (1980 cm^2)
Contributing scenario controlling worker exposure (5) PROC8a Maintenance and cleaning operations	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes

Amounts used, Frequency and duration of use		
Duration of activity	<8 hour(s)	
Technical conditions and measures to control dispersion from source towards the worker		
General ventilation	Basic general ventilation (1-3 air changes per hour)	
Containment	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Basic	
Conditions and measures related to personal protection, hygiene and health evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC 8f Professional use of building materials and articles creation		
Release route	**Release rate**	**Release estimation method**
Water	8.25 X 10^{-4} kg/day	ERC based
Air	0.012 kg/day	ERC based
Soil	4.125 X 10^{-4} kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	2.692 X 10^{-4} mg/L	< 0.01
Sea water	2.573 X 10^{-5} mg/L	< 0.01
Sewage treatment plant	5.221 X 10^{-5} mg/L	< 0.01
Man via Environment - Inhalation	2.912 X 10^{-11} mg/m^3	< 0.01
Man via Environment - Oral	7.287 X 10^{-5} mg/kg bw/day	< 0.01
Contributing scenario controlling worker exposure (1) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (2) PROC5 Mixing operations		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.188
Inhalation, Systemic effects, Acute	4 mg/m³	0.038
Inhalation, Local effects, Long Term	1 mg/m³	0.031
Inhalation, Local effects, Acute	4 mg/m³	0.038
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.873
Combined routes, Systemic effects, Acute	-	0.038
Contributing scenario controlling worker exposure (3) PROC14 Article preparation		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	1 mg/m³	0.188
Inhalation, Systemic effects, Acute	4 mg/m³	0.038
Inhalation, Local effects, Long Term	1 mg/m³	0.031
Inhalation, Local effects, Acute	4 mg/m³	0.038
Dermal, Systemic effects, Long Term	0.343 mg/kg bw/day	0.172
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.359
Combined routes, Systemic effects, Acute	-	0.038
Contributing scenario controlling worker exposure (4) PROC24 High energy processing		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	2 mg/m³	0.375
Inhalation, Systemic effects, Acute	8 mg/m³	0.077
Inhalation, Local effects, Long Term	2 mg/m³	0.062
Inhalation, Local effects, Acute	8 mg/m³	0.077
Dermal, Systemic effects, Long Term	0.283 mg/kg bw/day	0.142
Dermal, Local effects, Long Term	0.01 mg/cm^2	0.01
Combined routes, Systemic effects, Long Term	-	0.517
Combined routes, Systemic effects, Acute	-	0.077
Contributing scenario controlling worker exposure (5) PROC8a Maintenance and cleaning operations		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 18: Consumer building product use

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC0 Other
Contributing scenario controlling environmental exposure	ERC8f, ERC8c Consumer building product use
Contributing scenario controlling consumer exposure	PC0 Use of building products
Subsequent service life exposure scenario(s)	ES 25 Service life (professional worker); Service life articles used by workers; SU 5; SU 6b; SU 11; SU 12; SU 13; SU 16; SU 17; SU 18; SU 19; SU 0
	ES 26 Service life (consumers); Service life articles used by consumers
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC8f Consumer building product use	
Amounts used, Frequency and duration of use	
Daily wide dispersive use	≤ 8.25 X 10^{-5} tonnes/day
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days

Application of the STP sludge on agricultural soil	Yes	
Conditions and measures related to external treatment of waste for disposal		
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)		
Other given operational conditions affecting environmental exposure		
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days	
Contributing scenario controlling consumer exposure (1) PC0 Use of building products		
Product (article) characteristic		
Product/ Article subcategory	No value	
Concentration of substance in mixture	0.1 g/g	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC8f Consumer building product use		
Release route	**Release rate**	**Release estimation method**
Water	8.25 X 10^{-4} kg/day	ERC based
Air	0.012 kg/day	ERC based
Soil	4.125 X 10^{-4} kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	2.692 X 10^{-4} mg/L	<0.01
Sea water	2.573 X 10^{-5} mg/L	<0.01
Sewage treatment plant	5.221 X 10^{-5} mg/L	<0.01
Man via Environment - Inhalation	2.912 X 10^{-11} mg/m³	<0.01
Man via Environment - Oral	7.287 X 10^{-5} mg/kg bw/day	<0.01
Contributing scenario controlling consumer exposure (1) PC0 Use of building products		
Not available		
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 19: Formulation - Coatings and Inks

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC9a Coatings and paints, thinners, paint removers PC14 Metal surface treatment products, including galvanic and electroplating products PC18 Ink and toners
Contributing scenario controlling environmental exposure	ERC2 Formulation of preparations
Contributing scenario controlling worker exposure	PROC1 Use in closed process, no likelihood of exposure PROC2 Use in closed, continuous process with occasional controlled exposure PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b Receiving and charging of the substance PROC3 Mixing, dispersing, completion in closed batch process PROC5 Mixing, dispersing and completion in open multistage batch process PROC9 Filling small containers in dedicated lines PROC8a Transfer in non-dedicated facilities PROC8b Transfer at dedicated facilities PROC8a Maintenance and cleaning operations PROC15 Use as laboratory reagent
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC2 Formulation of preparations	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.7 tonnes/day
Annual use at site	≤ 150 tonnes/year
Percentage of tonnage used at regional scale	100%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC1 Use in closed process, no likelihood of exposure	

Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Use in closed systems. (minimal contact during routine operations)
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]

Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC8b Receiving and charging of the substance	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)

Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (5) PROC3 Mixing, dispersing, completion in closed batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed batch process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	One hand face only (240 cm^2)

Contributing scenario controlling worker exposure (6) PROC5 Mixing, dispersing and completion in open multistage batch process	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (7) PROC9 Filling small containers in dedicated lines	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced

Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (8) PROC8a Transfer in non-dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature < melting point
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (9) PROC8b Transfer at dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such

Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Good general ventilation (3-5 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (10) PROC8a Maintenance and cleaning operations	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use

Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	Two hands (960 cm^2)	
Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and duration of use		
Duration of activity	<8 hour(s)	
Technical conditions and measures to control dispersion from source towards the worker		
General ventilation	Basic general ventilation (1-3 air changes per hour)	
Containment	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Advanced	
Conditions and measures related to personal protection, hygiene and health evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 80%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Elevated temperature < melting point	
Skin surface potentially exposed	One hand face only (240 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC2 Formulation of preparations		
Release route	**Release rate**	**Release estimation method**
Water	7 kg/day	Release factor
Air	4.2 kg/day	Release factor
Soil	0 kg/day	Release factor
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.045 mg/L	0.446
Sea water	0.004 mg/L	0.446
Sewage treatment plant	0.443 mg/L	0.148
Man via Environment - Inhalation	6.855 X 10^{-4} mg/m³	< 0.01

Man via Environment - Oral	0.101 mg/kg bw/day	0.017
Contributing scenario controlling worker exposure (1) PROC1 Use in closed process, no likelihood of exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.007 mg/kg bw/day	<0.01
Dermal, Local effects, Long Term	0.002 mg/cm^2	<0.01
Combined routes, Systemic effects, Long Term	-	<0.01
Combined routes, Systemic effects, Acute	-	<0.01
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	<0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	<0.01
Inhalation, Local effects, Acute	0.04 mg/m³	<0.01
Dermal, Systemic effects, Long Term	0.274 mg/kg bw/day	0.137
Dermal, Local effects, Long Term	0.04 mg/cm^2	0.04
Combined routes, Systemic effects, Long Term	-	0.139
Combined routes, Systemic effects, Acute	-	<0.01

Contributing scenario controlling worker exposure (3) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (4) PROC8b Receiving and charging of the substance		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01

Contributing scenario controlling worker exposure (5) PROC3 Mixing, dispersing, completion in closed batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.069 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (6) PROC5 Mixing, dispersing and completion in open multistage batch process		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019

Contributing scenario controlling worker exposure (7) PROC9 Filling small containers in dedicated lines		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.362
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (8) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019

Contributing scenario controlling worker exposure (9) PROC8b Transfer at dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.07 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.28 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.07 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.28 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.356
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (10) PROC8a Maintenance and cleaning operations		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (11) PROC15 Use as laboratory reagent		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.068 mg/kg bw/day	0.034
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.053
Combined routes, Systemic effects, Acute	-	< 0.01
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 20: Use at industrial site - General Industrial use of coatings and inks

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC9a Coatings and paints, thinners, paint removers PC14 Metal surface treatment products, including galvanic and electroplating products PC18 Ink and toners
Sectors of use [SU]	SU6b Manufacture of pulp, paper and paper products SU7 Printing and reproduction of recorded media SU16 Manufacture of computer, electronic and optical products, electrical equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
Contributing scenario controlling environmental exposure	ERC5 Industrial use of coatings and inks involving water ERC5 Industrial use of coatings and inks water-free
Contributing scenario controlling worker exposure	PROC2 Application of coating and inks in closed system with occasional controlled exposure PROC8b Raw material receipt and transfer PROC5 Preparation of coating and inks application PROC8a Batch loading of equipment (manual, non dedicated) PROC7 Spray coating- any technique PROC10 Brushing, roller, spreader, flow coating or printing- any technique PROC13 Treatment of articles by dipping and pouring PROC2 Curing and drying processes after application- elevated temperature PROC8a Manual cleaning and maintenance of equipment

Subsequent service life exposure scenario(s)	ES 25 Service life (professional worker); Service life articles used by workers; SU 5; SU 6b; SU 11; SU 12; SU 13; SU 16; SU 17; SU 18; SU 19; SU 0
	ES 26 Service life (consumers); Service life articles used by consumers
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC5 Industrial use of coatings and inks involving water	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.7 tonnes/day
Annual use at site	≤ 150 tonnes/year
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 100%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling environmental exposure (2) ERC5 Industrial use of coatings and inks water-free	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.1 tonnes/day
Annual use at site	≤ 150 tonnes/year
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes

Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC2 Application of coatings and inks in closed system with occasional controlled exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (2) PROC8b Raw material receipt and transfer	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	5-25%
Solid in solid mixtures	Yes

Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (3) PROC5 Preparation of coatings and inks application	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield

Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC8a Batch loading of equipment (manual, non dedicated)	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (5) PROC7 Spray coating- any technique	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes

Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	Yes [Effectiveness - Inhalation: 95%]
Local exhaust ventilation (Dermal)	Yes [Effectiveness - Dermal: 95%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands and upper wrists (1500 cm^2)
Contributing scenario controlling worker exposure (6) PROC10 Brushing, roller, spreader, flow coating or printing- any technique	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 95%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]

Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (7) PROC13 Treatment of articles by dipping and pouring	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (8) PROC2 Curing and drying processes after application- elevated temperature	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes

Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (9) PROC8a Manual cleaning and maintenance of equipment	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield

Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC5 Industrial use of coatings and inks involving water		
Release route	**Release rate**	**Release estimation method**
Water	0 kg/day	SpERC based
Air	11.9 kg/day	SpERC based
Soil	0 kg/day	SpERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	2.64 X 10^{-4} mg/L	< 0.01
Sea water	2.521 X 10^{-5} mg/L	< 0.01
Sewage treatment plant	0 mg/L	< 0.01
Man via Environment - Inhalation	0.002 mg/m^3	< 0.01
Man via Environment - Oral	0.283 mg/kg bw/day	0.047
Contributing scenario controlling environmental exposure (2) ERC5 Industrial use of coatings and inks water-free		
Release route	**Release rate**	**Release estimation method**
Water	0.3 kg/day	SpERC based
Air	0 kg/day	SpERC based
Soil	0 kg/day	SpERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.002 mg/L	0.022
Sea water	2.151 X 10^{-4} mg/L	0.022
Sewage treatment plant	0.019 mg/L	< 0.01
Man via Environment - Inhalation	2.919 X 10^{-11} mg/m^3	< 0.01
Man via Environment - Oral	2.652 X 10^{-4} mg/kg bw/day	< 0.01
Contributing scenario controlling worker exposure (1) PROC2 Application of coating and inks in closed system with occasional controlled exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m^3	< 0.01

Inhalation, Systemic effects, Acute	0.04 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.04 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (2) PROC8b Raw material receipt and transfer		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.06 mg/m³	0.011
Inhalation, Systemic effects, Acute	0.24 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.06 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.24 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.823 mg/kg bw/day	0.411
Dermal, Local effects, Long Term	0.06 mg/cm^2	0.06
Combined routes, Systemic effects, Long Term	-	0.423
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (3) PROC5 Preparation of coating and inks application		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects,	1.371 mg/kg bw/day	0.686

Long Term		
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (4) PROC8a Batch loading of equipment (manual, non dedicated)		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (5) PROC7 Spray coating- any technique		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.05 mg/m³	< 0.01
Inhalation, Systemic effects, Acute	0.2 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.05 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.2 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.107 mg/kg bw/day	0.054
Dermal, Local effects, Long Term	0.005 mg/cm^2	< 0.01
Combined routes, Systemic effects, Long Term	-	0.063

Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (6) PROC10 Brushing, roller, spreader, flow coating or printing- any technique		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.78
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (7) PROC13 Treatment of articles by dipping and pouring		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (8) PROC2 Curing and drying processes after application- elevated temperature		

Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.04 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (9) PROC8a Manual cleaning and maintenance of equipment		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019

Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.

Exposure Scenario 21: Industrial use of Metal Treatment Products

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC9a Coatings and paints, thinners, paint removers PC14 Metal surface treatment products, including galvanic and electroplating products PC18 Ink and toners
Contributing scenario controlling environmental exposure	ERC5 Industrial use of Metal Treatment Products
Contributing scenario controlling worker exposure	PROC2 Application of metal surface treatment in closed systems with occasional exposure PROC8a Batch loading of equipment (manual, non dedicated) PROC8b Raw material receipt and transfer PROC13 Treatment of articles by dipping and pouring PROC8a Manual cleaning and maintenance of equipment
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC5 Industrial use of Metal Treatment Products	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.05 tonnes/day
Annual use at site	≤ 150 tonnes/year
Percentage of tonnage used at regional scale	100%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Chemical waste - discontinuous generation	Spent process fluid to be disposed of as chemical waste
Chemical waste - continuous generation	Spent fluid discharged to wastewater

On site treatment of wastewater	pH adjustment and subsequent filtration/sedimentation - Ni salts [Effectiveness - Water: 95%]
Contributing scenario controlling worker exposure (1) PROC2 Application of metal surface treatment in closed systems with occasional exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (2) PROC8a Batch loading of equipment (manual, non dedicated)	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.

Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (3) PROC8b Raw material receipt and transfer	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	5-25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)

Contributing scenario controlling worker exposure (4) PROC13 Treatment of articles by dipping and pouring	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (5) PROC8a Manual cleaning and maintenance of equipment	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.

Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Advanced	
Conditions and measures related to personal protection, hygiene and health evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC5 Industrial use of Metal Treatment Products		
Release route	**Release rate**	**Release estimation method**
Water	0.125 kg/day	SpERC based
Air	0 kg/day	SpERC based
Soil	0 kg/day	SpERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.001 mg/L	0.011
Sea water	1.043 X 10^{-4} mg/L	0.01
Sewage treatment plant	0.008 mg/L	< 0.01
Man via Environment - Inhalation	2.918 X 10^{-11} mg/m^3	< 0.01
Man via Environment - Oral	2.246 X 10^{-4} mg/kg bw/day	< 0.01
Contributing scenario controlling worker exposure (1) PROC2 Application of metal surface treatment in closed systems with occasional exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m^3	< 0.01
Inhalation, Systemic effects, Acute	0.04 mg/m^3	< 0.01
Inhalation, Local effects, Long Term	0.01 mg/m^3	< 0.01
Inhalation, Local effects, Acute	0.04 mg/m^3	< 0.01
Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068

Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (2) PROC8a Batch loading of equipment (manual, non dedicated)		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (3) PROC8b Raw material receipt and transfer		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.06 mg/m³	0.011
Inhalation, Systemic effects, Acute	0.24 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.06 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.24 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.823 mg/kg bw/day	0.411
Dermal, Local effects, Long Term	0.06 mg/cm^2	0.06
Combined routes, Systemic effects, Long Term	-	0.423
Combined routes, Systemic effects, Acute	-	< 0.01

Contributing scenario controlling worker exposure (4) PROC13 Treatment of articles by dipping and pouring		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (5) PROC8a Manual cleaning and maintenance of equipment		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019

Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.

Exposure Scenario 22: Professional painting and coatings

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC9a Coatings and paints, thinners, paint removers PC14 Metal surface treatment products, including galvanic and electroplating products PC18 Ink and toners
Sectors of use [SU]	SU15 Manufacture of fabricated metal products, except machinery and equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment SU19 Building and construction work SU0 Other
Contributing scenario controlling environmental exposure	ERC8f, ERC8c Use leading to inclusion into/onto matrix
Contributing scenario controlling worker exposure	PROC8a Transfer in non-dedicated facilities PROC10 Roller application or brushing PROC11 Non industrial spraying
Subsequent service life exposure scenario(s)	ES 25 Service life (professional worker); Service life articles used by workers; SU 5; SU 6b; SU 11; SU 12; SU 13; SU 16; SU 17; SU 18; SU 19; SU 0
	ES 26 Service life (consumers); Service life articles used by consumers
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC8f Use leading to inclusion into/onto matrix	
Amounts used, Frequency and duration of use	
Daily wide dispersive use	≤ 5.5 X 10^{-6} tonnes/day
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^{3} m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^{4} m^3/days

Contributing scenario controlling worker exposure (1) PROC8a Transfer in non-dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	5-25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Basic
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (2) PROC10 Roller application or brushing	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	5-25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<4 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]

Occupational Health and Safety Management System	Basic
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (3) PROC11 Non industrial spraying	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	5-25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<1 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Basic
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands and upper wrists (1500 cm^2)
Section 3: Exposure estimation and reference to its source	
Contributing scenario controlling environmental exposure (1) ERC8f Use leading to inclusion into/onto matrix	

Release route	Release rate	Release estimation method
Water	5.5 X 10^{-4} kg/day	ERC based
Air	0.008 kg/day	ERC based
Soil	2.75 X 10^{-4} kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	2.675 X 10^{-4} mg/L	< 0.01
Sea water	2.556 X 10^{-5} mg/L	< 0.01
Sewage treatment plant	3.481 X 10^{-5} mg/L	< 0.01
Man via Environment - Inhalation	2.912 X 10^{-11} mg/m³	< 0.01
Man via Environment - Oral	7.286 X 10^{-5} mg/kg bw/day	< 0.01
Contributing scenario controlling worker exposure (1) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.3 mg/m³	0.056
Inhalation, Systemic effects, Acute	1.2 mg/m³	0.012
Inhalation, Local effects, Long Term	0.3 mg/m³	< 0.01
Inhalation, Local effects, Acute	1.2 mg/m³	0.012
Dermal, Systemic effects, Long Term	0.823 mg/kg bw/day	0.411
Dermal, Local effects, Long Term	0.06 mg/cm^2	0.06
Combined routes, Systemic effects, Long Term	-	0.468
Combined routes, Systemic effects, Acute	-	0.012
Contributing scenario controlling worker exposure (2) PROC10 Roller application or brushing		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.18 mg/m³	0.034
Inhalation, Systemic effects, Acute	1.2 mg/m³	0.012
Inhalation, Local effects, Long Term	0.18 mg/m³	< 0.01
Inhalation, Local effects, Acute	1.2 mg/m³	0.012
Dermal, Systemic effects, Long Term	0.988 mg/kg bw/day	0.494
Dermal, Local effects, Long Term	0.072 mg/cm^2	0.072
Combined routes, Systemic effects, Long Term	-	0.528
Combined routes, Systemic effects, Acute	-	0.012
Contributing scenario controlling worker exposure (3) PROC11 Non industrial spraying		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.12 mg/m³	0.023
Inhalation, Systemic effects, Acute	2.4 mg/m³	0.023
Inhalation, Local effects, Long Term	0.12 mg/m³	< 0.01
Inhalation, Local effects, Acute	2.4 mg/m³	0.023
Dermal, Systemic effects, Long Term	1.286 mg/kg bw/day	0.643
Dermal, Local effects, Long Term	0.06 mg/cm^2	0.06
Combined routes, Systemic effects, Long Term	-	0.665
Combined routes, Systemic effects, Acute	-	0.023
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 23: Consumer painting and coatings

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC9a Coatings and paints, thinners, paint removers PC14 Metal surface treatment products, including galvanic and electroplating products PC18 Ink and toners
Contributing scenario controlling environmental exposure	ERC8f, ERC8c Use leading to inclusion into/onto matrix
Contributing scenario controlling consumer exposure	PC9a Use in water born wall paints, roller and brush application PC9a Use in rich solvent paints, roller and brush application PC14 Metal surface treatments (general) PC38 Welding and Flux products
Subsequent service life exposure scenario(s)	ES 25 Service life (professional worker); Service life articles used by workers; SU 5; SU 6b; SU 11; SU 12; SU 13; SU 16; SU 17; SU 18; SU 19; SU 0
	ES 26 Service life (consumers); Service life articles used by consumers
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC8f Use leading to inclusion into/onto matrix	
Amounts used, Frequency and duration of use	
Daily wide dispersive use	≤ 2.75 X 10^{-5} tonnes/day
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^{3} m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^{4} m^3/days
Contributing scenario controlling consumer exposure (1) PC9a Use in water born wall paints, roller and brush application	
Product (article) characteristic	
Product/ Article subcategory	Solvent rich, high solid, water borne paint
Spray	No.
Concentration of substance in mixture	0.05 g/g
Oral contact foreseen	No.

Amounts used, Frequency and duration of use		
Amount of product used per application	1.3 X 10^3 g/event	
Exposure time	2.2 hour(s)	
Frequency of use	1 event/day	
Other conditions affecting consumers exposure		
Body parts potentially exposed	Inside hands / one hand / palm of hands	
Dermal transfer factor	1	
Contributing scenario controlling consumer exposure (2) PC9a Use in rich solvent paints, roller and brush application		
Product (article) characteristic		
Product/ Article subcategory	Solvent rich, high solid, water borne paint	
Spray	No.	
Concentration of substance in mixture	0.05 g/g	
Oral contact foreseen	No.	
Amounts used, Frequency and duration of use		
Amount of product used per application	1 X 10^3 g/event	
Exposure time	2.2 hour(s)	
Frequency of use	1 event/day	
Other conditions affecting consumers exposure		
Body parts potentially exposed	Inside hands / one hand / palm of hands	
Dermal transfer factor	1	
Contributing scenario controlling consumer exposure (3) PC14 Metal surface treatments (general)		
Product (article) characteristic		
Product/ Article subcategory	No value	
Contributing scenario controlling consumer exposure (4) PC38 Welding and Flux products		
Product (article) characteristic		
Product/ Article subcategory	No value	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC8f Use leading to inclusion into/onto matrix		
Release route	**Release rate**	**Release estimation method**
Water	2.75 X 10^{-4} kg/day	ERC based
Air	0.004 kg/day	ERC based
Soil	1.375 X 10^{-4} kg/day	ERC based

Protection target	Exposure estimation	Risk characterisation ratio
Fresh water	2.657 X 10^{-4} mg/L	<0.01
Sea water	2.538 X 10^{-5} mg/L	<0.01
Sewage treatment plant	1.74 X 10^{-5} mg/L	<0.01
Man via Environment - Inhalation	2.912 X 10^{-11} mg/m³	<0.01
Man via Environment - Oral	7.285 X 10^{-5} mg/kg bw/day	<0.01
Contributing scenario controlling consumer exposure (1) PC9a Use in water born wall paints, roller and brush application		
Method: TRA Consumer v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.022 mg/m³	0.014
Inhalation, Local effects, Long Term	0.022 mg/m³	0.014
Dermal, Systemic effects, Long Term	3.573 mg/kg bw/day	0.596
Oral, Systemic effects, Long Term	0 mg/kg bw/day	< 0.01
Combined routes, Systemic effects, Long Term	-	0.609
Contributing scenario controlling consumer exposure (2) PC9a Use in rich solvent paints, roller and brush application		
Method: TRA Consumer v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.022 mg/m³	0.014
Inhalation, Local effects, Long Term	0.022 mg/m³	0.014
Dermal, Systemic effects, Long Term	3.573 mg/kg bw/day	0.596
Oral, Systemic effects, Long Term	0 mg/kg bw/day	< 0.01
Combined routes, Systemic effects, Long Term	-	0.609
Contributing scenario controlling consumer exposure (3) PC14 Metal surface treatments (general)		
Not available		
Contributing scenario controlling consumer exposure (4)		

PC38 Welding and Flux products
Not available
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.

Exposure Scenario 24: General industrial use in production of polymers and resins

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC32 Polymer preparations and compounds
Sectors of use [SU]	SU11 Manufacture of rubber products SU12 Manufacture of plastics products, including compounding and conversion
Contributing scenario controlling environmental exposure	ERC5 General industrial use in production of polymers and resins
Contributing scenario controlling worker exposure	PROC8b Raw material receipt and transfer PROC5 Preparation of polymers and resins PROC14 Polymer compounding PROC24 Polymer compounding (high energy) PROC8a Batch loading of equipment (manual, non dedicated) PROC8a Manual cleaning and maintenance of equipment
Subsequent service life exposure scenario(s)	ES 25 Service life (professional worker); Service life articles used by workers; SU 5; SU 6b; SU 11; SU 12; SU 13; SU 16; SU 17; SU 18; SU 19; SU 0
	ES 26 Service life (consumers); Service life articles used by consumers
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC5 General industrial use in production of polymers and resins	
Amounts used, Frequency and duration of use	
Daily use at site	≤ 0.7 tonnes/day
Annual use at site	≤ 150 tonnes/year
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	

Receiving surface water flow	≥ 1.8 X 10^4 m^3/days
Contributing scenario controlling worker exposure (1) PROC8b Raw material receipt and transfer	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (2) PROC5 Preparation of polymers and resins	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced

Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (3) PROC14 Polymer compounding	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC24 Polymer compounding (high energy)	
Product (article) characteristic	
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	

Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	Yes [Effectiveness - Inhalation: 80%]
Local exhaust ventilation (Dermal)	No. [Effectiveness - Dermal: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Elevated temperature > melting point
Skin surface potentially exposed	Two hands and forearms (1980 cm^2)
Contributing scenario controlling worker exposure (5) PROC8a Batch loading of equipment (manual, non dedicated)	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use

Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm^2)	
Contributing scenario controlling worker exposure (6) PROC8a Manual cleaning and maintenance of equipment		
Product (article) characteristic		
Dustiness of material	Low	
Concentration of substance in mixture	Substance as such	
Amounts used, Frequency and duration of use		
Duration of activity	<8 hour(s)	
Technical conditions and measures to control dispersion from source towards the worker		
General ventilation	Basic general ventilation (1-3 air changes per hour)	
Containment	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Advanced	
Conditions and measures related to personal protection, hygiene and health evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC5 General industrial use in production of polymers and resins		
Release route	**Release rate**	**Release estimation method**
Water	14 kg/day	Release factor
Air	0.7 kg/day	Release factor
Soil	7 kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	0.089 mg/L	0.889
Sea water	0.009 mg/L	0.889
Sewage treatment plant	0.886 mg/L	0.295
Man via Environment - Inhalation	1.142 X 10^{-4} mg/m³	< 0.01

Man via Environment - Oral	0.018 mg/kg bw/day	< 0.01
Contributing scenario controlling worker exposure (1) PROC8b Raw material receipt and transfer		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm²	0.1
Combined routes, Systemic effects, Long Term	-	0.704
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (2) PROC5 Preparation of polymers and resins		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm²	0.2
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (3) PROC14 Polymer compounding		
Method: TRA Worker v3		

Route of exposure and type of effects	Exposure concentration	Risk characterisation ratio
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.343 mg/kg bw/day	0.172
Dermal, Local effects, Long Term	0.05 mg/cm^2	0.05
Combined routes, Systemic effects, Long Term	-	0.19
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (4) PROC24 Polymer compounding (high energy)		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	2 mg/m³	0.375
Inhalation, Systemic effects, Acute	8 mg/m³	0.077
Inhalation, Local effects, Long Term	2 mg/m³	0.062
Inhalation, Local effects, Acute	8 mg/m³	0.077
Dermal, Systemic effects, Long Term	0.283 mg/kg bw/day	0.142
Dermal, Local effects, Long Term	0.01 mg/cm^2	0.01
Combined routes, Systemic effects, Long Term	-	0.517
Combined routes, Systemic effects, Acute	-	0.077
Contributing scenario controlling worker exposure (5) PROC8a Batch loading of equipment (manual, non dedicated)		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019

Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (6) PROC8a Manual cleaning and maintenance of equipment		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 25: Professional use of resins

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC32 Polymer preparations and compounds
Sectors of use [SU]	SU10 Formulation [mixing] of preparations and/or re-packaging (excluding alloys) SU11 Manufacture of rubber products SU12 Manufacture of plastics products, including compounding and conversion SU19 Building and construction work
Contributing scenario controlling environmental exposure	ERC8f, ERC8c Professional use of resins
Contributing scenario controlling	PROC8a Transfer in non-dedicated facilities

worker exposure	PROC5 Mixing (general) PROC11 Non industrial spraying PROC10 Roller application or brushing
Subsequent service life exposure scenario(s)	ES 25 Service life (professional worker); Service life articles used by workers; SU 5; SU 6b; SU 11; SU 12; SU 13; SU 16; SU 17; SU 18; SU 19; SU 0
	ES 26 Service life (consumers); Service life articles used by consumers
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC8f Professional use of resins	
Amounts used, Frequency and duration of use	
Daily wide dispersive use	≤ 5.5 X 10^{-5} tonnes/day
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^{3} m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^{4} m^3/days
Contributing scenario controlling worker exposure (1) PROC8a Transfer in non-dedicated facilities	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety	Basic

Management System	
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands (960 cm^2)
Contributing scenario controlling worker exposure (2) PROC5 Mixing (general)	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	>25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Basic
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (3) PROC11 Non industrial spraying	
Product (article) characteristic	
Dustiness of material	Low

Concentration of substance in mixture	5-25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<1 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Basic
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands and upper wrists (1500 cm^2)
Contributing scenario controlling worker exposure (4) PROC10 Roller application or brushing	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	5-25%
Solid in solid mixtures	Yes
Amounts used, Frequency and duration of use	
Duration of activity	<4 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Basic
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]

Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC8f Professional use of resins		
Release route	**Release rate**	**Release estimation method**
Water	5.5 X 10^{-4} kg/day	ERC based
Air	0.008 kg/day	ERC based
Soil	2.75 X 10^{-4} kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	2.675 X 10^{-4} mg/L	< 0.01
Sea water	2.556 X 10^{-5} mg/L	< 0.01
Sewage treatment plant	3.481 X 10^{-5} mg/L	< 0.01
Man via Environment - Inhalation	2.912 X 10^{-11} mg/m^3	< 0.01
Man via Environment - Oral	7.286 X 10^{-5} mg/kg bw/day	< 0.01
Contributing scenario controlling worker exposure (1) PROC8a Transfer in non-dedicated facilities		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m^3	0.094
Inhalation, Systemic effects, Acute	2 mg/m^3	0.019
Inhalation, Local effects, Long Term	0.5 mg/m^3	0.016
Inhalation, Local effects, Acute	2 mg/m^3	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic effects, Acute	-	0.019

Contributing scenario controlling worker exposure (2) PROC5 Mixing (general)		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.188
Inhalation, Systemic effects, Acute	4 mg/m³	0.038
Inhalation, Local effects, Long Term	1 mg/m³	0.031
Inhalation, Local effects, Acute	4 mg/m³	0.038
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.2 mg/cm^2	0.2
Combined routes, Systemic effects, Long Term	-	0.873
Combined routes, Systemic effects, Acute	-	0.038
Contributing scenario controlling worker exposure (3) PROC11 Non industrial spraying		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.12 mg/m³	0.023
Inhalation, Systemic effects, Acute	2.4 mg/m³	0.023
Inhalation, Local effects, Long Term	0.12 mg/m³	< 0.01
Inhalation, Local effects, Acute	2.4 mg/m³	0.023
Dermal, Systemic effects, Long Term	1.286 mg/kg bw/day	0.643
Dermal, Local effects, Long Term	0.06 mg/cm^2	0.06
Combined routes, Systemic effects, Long Term	-	0.665
Combined routes, Systemic effects, Acute	-	0.023
Contributing scenario controlling worker exposure (4) PROC10 Roller application or brushing		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**

Inhalation, Systemic effects, Long Term	0.18 mg/m³	0.034
Inhalation, Systemic effects, Acute	1.2 mg/m³	0.012
Inhalation, Local effects, Long Term	0.18 mg/m³	< 0.01
Inhalation, Local effects, Acute	1.2 mg/m³	0.012
Dermal, Systemic effects, Long Term	0.988 mg/kg bw/day	0.494
Dermal, Local effects, Long Term	0.072 mg/cm^2	0.072
Combined routes, Systemic effects, Long Term	-	0.528
Combined routes, Systemic effects, Acute	-	0.012
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 26: Consumer resin use

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC32 Polymer preparations and compounds
Contributing scenario controlling environmental exposure	ERC8f, ERC8c Consumer resin use
Contributing scenario controlling consumer exposure	PC32 Use of resins PC1 Adhesives, sealants
Subsequent service life exposure scenario(s)	ES 25 Service life (professional worker); Service life articles used by workers; SU 5; SU 6b; SU 11; SU 12; SU 13; SU 16; SU 17; SU 18; SU 19; SU 0
	ES 26 Service life (consumers); Service life articles used by consumers
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC8f Consumer resin use	
Amounts used, Frequency and duration of use	
Daily wide dispersive use	≤ 2.75 X 10^{-5} tonnes/day
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^3 m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	

Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)		
Other given operational conditions affecting environmental exposure		
Receiving surface water flow	≥ 1.8 X 10^4 m^3/days	
Contributing scenario controlling consumer exposure (1) PC32 Use of resins		
Product (article) characteristic		
Product/ Article subcategory	No value	
Contributing scenario controlling consumer exposure (2) PC1 Adhesives, sealants		
Product (article) characteristic		
Product/ Article subcategory	Glues DIY-use (carpet glue, tile glue, wood parquet glue)	
Concentration of substance in mixture	0.05 g/g	
Oral contact foreseen	No.	
Amounts used, Frequency and duration of use		
Amount of product used per application	10 g/event	
Exposure time	6 hour(s)	
Frequency of use	1 event/day	
Other conditions affecting consumers exposure		
Body parts potentially exposed	Inside hands / one hand / palm of hands	
Dermal transfer factor	1	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC8f Consumer resin use		
Release route	**Release rate**	**Release estimation method**
Water	2.75 X 10^{-4} kg/day	ERC based
Air	0.004 kg/day	ERC based
Soil	1.375 X 10^{-4} kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	2.657 X 10^{-4} mg/L	<0.01
Sea water	2.538 X 10^{-5} mg/L	<0.01
Sewage treatment plant	1.74 X 10^{-5} mg/L	<0.01
Man via Environment - Inhalation	2.912 X 10^{-11} mg/m³	<0.01
Man via Environment - Oral	7.285 X 10^{-5} mg/kg bw/day	<0.01
Contributing scenario controlling consumer exposure (1)		

PC32 Use of resins		
Not available		
Contributing scenario controlling consumer exposure (1) PC1 Adhesives, sealants		
Method: TRA Consumer v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.005 mg/m³	0.014
Inhalation, Local effects, Long Term	0.005 mg/m³	0.014
Dermal, Systemic effects, Long Term	3.573 mg/kg bw/day	0.596
Oral, Systemic effects, Long Term	0 mg/kg bw/day	< 0.01
Combined routes, Systemic effects, Long Term	-	0.609
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 27: Laboratory use (professional worker)

Section 1: Title of exposure scenario	
Chemical product category [PC]	PC20 Products such as ph-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals
Sectors of use [SU]	SU5 Manufacture of textiles, leather, fur SU6b Manufacture of pulp, paper and paper products SU11 Manufacture of rubber products SU12 Manufacture of plastics products, including compounding and conversion SU13 Manufacture of other non-metallic mineral products, e.g. plasters, cement SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment SU19 Building and construction work SU24 Scientific research and development
Contributing scenario controlling environmental exposure	ERC8e, ERC8b Laboratory use (professional worker)
Contributing scenario controlling worker exposure	PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises PROC2 Use in closed, continuous process with occasional controlled exposure PROC9 Transfer of substance or preparations in small containers PROC15 Use as laboratory reagent PROC8a Maintenance and cleaning operations
Section 2: Operational conditions of use	

Contributing scenario controlling environmental exposure (1) ERC8e Laboratory use (professional worker)	
Amounts used, Frequency and duration of use	
Daily wide dispersive use	≤ 5.5 X 10^{-7} tonnes/day
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^{3} m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^{4} m^3/days
Contributing scenario controlling worker exposure (1) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Basic
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient

Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Closed continuous process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Basic
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (3) PROC9 Transfer of substance or preparations in small containers	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Basic

Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	Two hands face (480 cm^2)
Contributing scenario controlling worker exposure (4) PROC15 Use as laboratory reagent	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amounts used, Frequency and duration of use	
Duration of activity	<8 hour(s)
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation	Basic general ventilation (1-3 air changes per hour)
Containment	No.
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]
Occupational Health and Safety Management System	Basic
Conditions and measures related to personal protection, hygiene and health evaluation	
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]
Respiratory protection	No. [Effectiveness - Inhalation: 0%]
Eye Protection	Safety spectacles/goggles/full face shield
Other given operational conditions affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Ambient
Skin surface potentially exposed	One hand face only (240 cm^2)
Contributing scenario controlling worker exposure (5) PROC8a Maintenance and cleaning operations	
Product (article) characteristic	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such

Amounts used, Frequency and duration of use		
Duration of activity	<8 hour(s)	
Technical conditions and measures to control dispersion from source towards the worker		
General ventilation	Basic general ventilation (1-3 air changes per hour)	
Containment	No.	
Local exhaust ventilation	No. [Effectiveness - Inhalation: 0%]	
Occupational Health and Safety Management System	Basic	
Conditions and measures related to personal protection, hygiene and health evaluation		
Hand protection/ Skin protection	Wear impervious gloves (EN374). [Effectiveness - Dermal: 90%]	
Respiratory protection	No. [Effectiveness - Inhalation: 0%]	
Eye Protection	Safety spectacles/goggles/full face shield	
Other given operational conditions affecting workers exposure		
Place of use	Indoor use	
Process temperature (for solid)	Ambient	
Skin surface potentially exposed	Two hands (960 cm^2)	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC8e Laboratory use (professional worker)		
Release route	**Release rate**	**Release estimation method**
Water	1.1 X 10^{-5} kg/day	ERC based
Air	5.5 X 10^{-7} kg/day	ERC based
Soil	5.5 X 10^{-6} kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	2.641 X 10^{-4} mg/L	<0.01
Sea water	2.522 X 10^{-5} mg/L	<0.01
Sewage treatment plant	6.961 X 10^{-7} mg/L	<0.01
Man via Environment - Inhalation	2.912 X 10^{-11} mg/m^3	<0.01
Man via Environment - Oral	7.285 X 10^{-5} mg/kg bw/day	<0.01
Contributing scenario controlling worker exposure (1) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	1 mg/m^3	0.188

Inhalation, Systemic effects, Acute	4 mg/m³	0.038
Inhalation, Local effects, Long Term	1 mg/m³	0.031
Inhalation, Local effects, Acute	4 mg/m³	0.038
Dermal, Systemic effects, Long Term	0.686 mg/kg bw/day	0.343
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.531
Combined routes, Systemic effects, Acute	-	0.038
Contributing scenario controlling worker exposure (2) PROC2 Use in closed, continuous process with occasional controlled exposure		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.04 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.137 mg/kg bw/day	0.068
Dermal, Local effects, Long Term	0.02 mg/cm^2	0.02
Combined routes, Systemic effects, Long Term	-	0.07
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (3) PROC9 Transfer of substance or preparations in small containers		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects,	0.686 mg/kg bw/day	0.343

Long Term		
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.437
Combined routes, Systemic effects, Acute	-	0.019
Contributing scenario controlling worker exposure (4) PROC15 Use as laboratory reagent		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.1 mg/m³	0.019
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Inhalation, Local effects, Long Term	0.1 mg/m³	< 0.01
Inhalation, Local effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.034 mg/kg bw/day	0.017
Dermal, Local effects, Long Term	0.01 mg/cm^2	< 0.01
Combined routes, Systemic effects, Long Term	-	0.036
Combined routes, Systemic effects, Acute	-	< 0.01
Contributing scenario controlling worker exposure (5) PROC8a Maintenance and cleaning operations		
Method: TRA Worker v3		
Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation ratio**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.094
Inhalation, Systemic effects, Acute	2 mg/m³	0.019
Inhalation, Local effects, Long Term	0.5 mg/m³	0.016
Inhalation, Local effects, Acute	2 mg/m³	0.019
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	0.686
Dermal, Local effects, Long Term	0.1 mg/cm^2	0.1
Combined routes, Systemic effects, Long Term	-	0.779
Combined routes, Systemic	-	0.019

effects, Acute		
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 28: Service life articles used by workers

Section 1: Title of exposure scenario	
Sectors of use [SU]	SU5 Manufacture of textiles, leather, fur SU6b Manufacture of pulp, paper and paper products SU11 Manufacture of rubber products SU12 Manufacture of plastics products, including compounding and conversion SU13 Manufacture of other non-metallic mineral products, e.g. plasters, cement SU16 Manufacture of computer, electronic and optical products, electrical equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment SU18 Manufacture of furniture SU19 Building and construction work SU0 Other
Article Categories [AC]	AC1 Vehicles AC2 Machinery, mechanical appliances, electrical/electronic articles AC4 Stone, plaster, cement, glass and ceramic articles AC5 Fabrics, textiles and apparel AC6 Leather articles AC8 Paper articles AC10 Rubber articles AC13 Plastic articles AC0 Other Articles
Contributing scenario controlling environmental exposure	ERC10a, ERC11a Use in articles
Exposure scenario of the uses leading to the inclusion of the substance into the article	ES6: Consumer Use - Consumer water treatment and cleaning product use ES11: Use at industrial site - Use at industrial sites of dyestuffs and in textiles uses ES13: Use at industrial site - Use at industrial sites in construction products ES14: Use by professional worker - Professional creation of building materials and articles ES15: Consumer Use - Consumer building product use ES17: Use at industrial site - General Industrial use of coatings and inks ES19: Use by professional worker - Professional painting and coatings ES20: Consumer Use - Consumer painting and coatings ES21: Use at industrial site - General industrial use in production of polymers and resins ES22: Use by professional worker - Professional use of resins ES23: Consumer Use - Consumer resin use
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC10a Use in articles	

Amounts used, Frequency and duration of use		
Daily wide dispersive use	≤ 5.5 X 10^{-4} tonnes/day	
Percentage of tonnage used at regional scale	10%	
Conditions and measures related to municipal sewage treatment plant		
Municipal STP	Yes. [Effectiveness - Water: 87.34%]	
Discharge rate of STP	≥ 2 X 10^{3} m^3/days	
Application of the STP sludge on agricultural soil	Yes	
Conditions and measures related to external treatment of waste for disposal		
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)		
Other given operational conditions affecting environmental exposure		
Receiving surface water flow	≥ 1.8 X 10^{4} m^3/days	
Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC10a Use in articles		
Release route	**Release rate**	**Release estimation method**
Water	0.018 kg/day	ERC based
Air	2.75 X 10^{-4} kg/day	ERC based
Soil	0.018 kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	3.754 X 10^{-4} mg/L	<0.01
Sea water	3.635 X 10^{-5} mg/L	<0.01
Sewage treatment plant	0.001 mg/L	<0.01
Man via Environment - Inhalation	2.912 X 10^{-11} mg/m³	<0.01
Man via Environment - Oral	7.33 X 10^{-5} mg/kg bw/day	<0.01
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		

Exposure Scenario 29: Service life articles used by consumers

Section 1: Title of exposure scenario	
Contributing scenario controlling environmental exposure	ERC10a, ERC11a Service life articles used by consumers
Exposure scenario of the uses leading to the inclusion of the substance into the article	ES6: Consumer Use - Consumer water treatment and cleaning product use ES9: Consumer Use - Consumer cosmetics, pharmaceuticals and personal care products ES11: Use at industrial site - Use at industrial sites of dyestuffs and in textiles uses ES13: Use at industrial site - Use at industrial sites in construction products ES14: Use by professional worker - Professional creation of building materials and articles ES15: Consumer Use - Consumer building product use ES17: Use at industrial site - General Industrial use of coatings and inks ES19: Use by professional worker - Professional painting and coatings ES20: Consumer Use - Consumer painting and coatings ES21: Use at industrial site - General industrial use in production of polymers and resins ES22: Use by professional worker - Professional use of resins ES23: Consumer Use - Consumer resin use
Section 2: Operational conditions of use	
Contributing scenario controlling environmental exposure (1) ERC10a Service life articles used by consumers	
Amounts used, Frequency and duration of use	
Daily wide dispersive use	≤ 5.5 X 10^{-4} tonnes/day
Percentage of tonnage used at regional scale	10%
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes. [Effectiveness - Water: 87.34%]
Discharge rate of STP	≥ 2 X 10^{3} m^3/days
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow	≥ 1.8 X 10^{4} m^3/days

Section 3: Exposure estimation and reference to its source		
Contributing scenario controlling environmental exposure (1) ERC10a Use in articles		
Release route	**Release rate**	**Release estimation method**
Water	0.018 kg/day	ERC based
Air	2.75 X 10^{-4} kg/day	ERC based
Soil	0.018 kg/day	ERC based
Protection target	**Exposure estimation**	**Risk characterisation ratio**
Fresh water	3.754 X 10^{-4} mg/L	<0.01
Sea water	3.635 X 10^{-5} mg/L	<0.01
Sewage treatment plant	0.001 mg/L	<0.01
Man via Environment - Inhalation	2.912 X 10^{-11} mg/m³	<0.01
Man via Environment - Oral	7.33 X 10^{-5} mg/kg bw/day	<0.01
Section 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES		
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.		